ILLICIT DISCHARGE DETECTION AND ELIMINATION (IDDE) PROGRAM SUPPLEMENTAL UDPATE

CITY OF HOLYOKE, MASSACHUSETTS

JUNE 2025

A Report Prepared for:

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ILLICIT DISCHARGE DETECTION AND ELIMINATION (IDDE) PROGRAM SUPPLEMENTAL UPDATE

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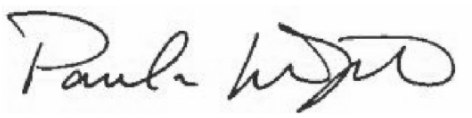

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June 2025
Kleinfelder Project No.: 25002430.001A

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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 by the City of Holyoke.

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**.**

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).

ACRONYMS

BMP – Best Management Practice
CCTV – Closed-Circuit Television
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

ILLICIT DISCHARGE DETECTION AND ELIMINATION (IDDE) PROGRAM SUPPLEMENTAL UPDATE
CITY OF HOLYOKE, MASSACHUSETTS

1 INTRODUCTION

The City of Holyoke, hereafter referred to as "the City" or "Holyoke," developed and implemented a robust IDDE program to address the requirements of the US EPA and MassDEP NPDES MS4 Permit, effective July 1st, 2018, hereinafter referred to as the "2016 MS4 Permit" or "MS4 Permit". The City of Holyoke negotiated a Consent Decree, hereinafter referred to as the "Consent Decree" or "CD," which was finalized in 2023 and defined the terms that the City shall take to reach compliance with the MS4 program.

The Permit contains the framework for the IDDE program, including an evaluation of the City's legal authority to remove illicit connections to the stormwater sewer system, two (2) phases of stormwater system mapping, continual outfall classification, procedures for screening and sampling outfalls, and methods for determining and eliminating illicit connections. The current stormwater system map is included in Appendix A, the Reprioritized Outfall Inventory is included in Appendix B, and the field investigation records are included in Appendix C.

As of Permit Year 7 (July 1, 2024 – June 30, 2025), Holyoke's IDDE reporting has been restructured. All background information, requirements, methodologies, and any other information necessary to comply with the MS4 Permit and the 2023 Consent Decree, are in the *Illicit Discharge Detection and Elimination (IDDE) Program Requirements* document included as Appendix D. All IDDE Program progress and updates will be summarized in this supplementary document, the IDDE Program Supplemental Update, which will be generated annually. This document will include all data from field investigations and results from sampling that occurred during Permit Year (PY 7).

2 PERMIT YEAR 7 PROGRESS SUMMARY

2.1 MAPPING UPDATES

Updates to the City's MS4 mapping in PY 7 consisted of the following:

- Added new drainage manholes
- Removed state and private outfalls (7 outfalls)
- Added new outfall locations (5 outfalls)
- Added new catch basins
- Updated CSO outfall labeling post sewer separation
- Updated catchment area delineations
- Corrected inaccuracies in asset attributes

Refer to Appendix A for an updated storm system map.

2.2 PRIORITIZATION UPDATES

There were five (5) new outfalls added to the map in PY 7. However, more information needs to be collected for these outfalls, so updates to the reprioritization will occur in PY 8. The reprioritized outfall inventory was updated in June 2024 of PY 6, but the five (5) new outfalls were added to the list and marked as "Not Yet Prioritized" in PY 7. The inventory is included in Appendix B. The number of MS4 outfalls in each of the priority categories is listed in Table 2-1.

Table 2-1: Outfall Priority Categorization

Outfall Priority Category	Number of Outfalls
Problem	16
High	48
Low	32
Not Yet Prioritized	5
Total	**101**

2.3 DRY WEATHER SCREENING UPDATES

All of the dry weather outfall screenings that were required by the 2016 MS4 Permit were completed in PY 6 (2023-2024). However, five (5) new outfalls were added to the MS4 inventory in PY 7, so screening of those additional outfalls will occur in PY 8.

2.4 WET WEATHER SCREENING UPDATES

The City is required to screen all 103 outfalls during wet weather once every three (3) years per the CD. In PY 7 Veolia trained City staff and completed 41 wet weather outfall screenings. All outfalls that were screened were tested for E. coli, ammonia, chlorine, surfactants, salinity, and conductivity. While all samples contained E. coli, only 28 of them tested above the EPA threshold[1]. The City will further investigate the catchments connected to the 28 outfalls that yielded high bacteria results. Field investigation records are included in Appendix C.

2.5 CATCHMENT INVESTIGATION UPDATES

Field staff attempted 11 catchment investigations from the prioritized outfall list. Nine (9) of the outfalls had flow, while two did not. The catchments associated with the outfalls that did not have flow (CA035-A and CA038) were not further investigated.

Five (5) of the catchment areas that were investigated drain to outfalls categorized as Problem outfalls (CA086, CA068, CA071, CA073, and CA143). The flow found in three (3) of the catchments (CA086, CA068, and CA071) tested above the EPA threshold for E. coli[1]. Refer to Table 2-2 for a summary of E. coli results of these three (3) outfalls. The City plans to further investigate these catchments to confirm the source of contamination. Field investigation records are included in Appendix C, and a record of IDDE training attendees from Veolia and the City is included in Appendix E.

[1] *When E. coli is above 410 MPN/100 ml, this indicates that a catchment has a potential illicit discharge.*

Table 2-2: Summary of Catchment Bacteria Results

Outfall ID	Structure ID	E. coli (MPN/100 ml)
CA086	DMH-086-0100	>410
CA068	DMH-068-0004	>410
CA071	DMH-071-0017	629

2.6 ILLICIT DISCHARGE DETECTION

On May 22, 2025, dye testing was conducted at a potential illicit discharge at Conklin Furniture at 75 Appleton Street. A first-floor sink in the southwest corner of the property was confirmed to discharge directly into a separated manhole (MH# P17-DMH-7802) intended for stormwater runoff. It was also suspected that a bathroom in the same location tied directly into the 8-inch pipe that feeds the same separated manhole. At the time of testing, it was also raining. When the separated discharge manhole was inspected, a constant flow could be seen indicating that the roof leaders may also be connected. Pictures from the investigation are included below.

Figure 2-1: Dye Test Source at Sink

Figure 2-2: Dye Test Discharge in Storm Drain

Building plans, provided by the Facility Manager, were reviewed, however, no other internal plumbing records were included. The City has not been able to confirm that the identified location is the only one tied to the same discharge point. The City has taken the necessary steps to remove the illicit connection, which includes notifying the owner of the City's MS4 ordinance, the need to remove the illicit connection, and the timeline for which to do so. The facility will be responsible for identifying any other illicit connections tied into the 8-inch pipe and separated stormwater manhole prior to removing.

Another potential illicit discharge was discovered back in April of 2024 when Outfall ID CA143 was tested during Dry Weather Screenings due to observing a very small flow. The Outfall that was tested is located between Mowry Avenue and Nichols Drive. Of all the required parameters tested, the only test results above the mandated threshold were for E. Coli. A Catchment Investigation then occurred, and flow was followed upstream through approximately six (6) properties along both Fenton Street and Homestead Avenue (DMH-028-001). However, further upstream, flow was absent and all other structures were dry. This Catchment was also visited in May of 2025. Flow was found at the outfall and tested again for all parameters; however, no parameters that were tested were found to be above the mandated threshold, including E. Coli. However, shortly after, this same Outfall was also tested during Wet Weather Screenings and E. Coli did test above the mandated threshold.

Records review revealed that there is no sewer pipe or potential inputs of sewer near this Catchment. After discussion between the City and Veolia, it was determined that positive E. Coli hits are most likely

due to runoff infiltrating into the catchment and sources may be a combination of pet waste and other decomposing organics. As such, the City is preparing to send out mailers directly to the approximate six (6) properties in regards to picking up pet waste. While the City does provide these same materials to pet owners when attaining licenses, the follow up mailers will serve as reinforcement to the specific households. As such, this potential illicit discharge is no longer considered a potential illicit and no further action is required.

2.7 SANITARY SEWER OVERFLOW (SSO) UPDATES

The inventory in Table 2-3 will be updated when new SSOs are observed and reported in the last five (5) years. The SSO inventory is included in the Annual Report, including the status of mitigation and corrective measures to address each identified SSO.

Table 2-3: Sanitary Sewer Overflow (SSO) Inventory

SSO Location[1]	Discharge Statement[2]	Date[3]	Duration[3] (hours)	Estimated Volume[4] (Gallons)	Description[5]	Mitigation Completed[6]
1 Berkshire St.	CT. River	5/17/2025	1	500-1,000	WWTP Influent Pumps failed after an electrical issue, causing a backup from a manhole and into a catch basin.	The affected area was jet cleaned and swept up.
145 Westfield Rd. and Woodland St.	No release to surface water	4/6/2024	1	1000	Sewer system blockage	Jetted main and removed blockage, vac cleaned the affected area.
105 Old Easthampton Rd.	No release to surface water	10/25/2023	1.25	25-50	Sewer system blockage	Jetted main and removed blockage, vac cleaned the affected area.
58 Canal St.	No release to surface water	11/9/2023	1.5	<100	Sewer System Blockage	Jetted main and removed blockage, vac cleaned the affected area.
Highland Park Pump Station	CT. River	3/17/2023	3.25	600	Force main failure	Setup bypass and shut station down. Replaced failed section of main.
50 Holy Family Rd.	Tannery Brook	12/08/2022	1.25	1,500	Grease & debris	Removed blockage. Jet cleaned sewer main.
Yale St.	Ground	8/23/2022	Unknown	300-500	Unbolted manhole	Replaced missing bolts on manhole
Whiting Reservoir	CT. River	6/07/2022	3.25	900	Grease & debris	Removed blockage. Jet cleaned sewer main.
63 Canal St.	CT. River	4/26/2022	0.5	225	Grease & debris	Removed blockage. Jet cleaned sewer main.

[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] Duration of each known SSO occurrence (i.e., beginning and end of any known discharge)
[4] Estimated volume(s) of the occurrence
[5] Description of the occurrence indicating known or suspected cause(s)
[6] Mitigation and corrective measures completed and planned

2.8 NEXT STEPS

Wet weather screenings of outfalls and investigations of the catchment areas associated with the outfalls and stormwater interconnections started in 2024 (PY 6). A preliminary schedule to complete these investigations within three years is shown in Table 2-4. This schedule extends through the end of the MS4 Permit in July of 2028. The table includes the status of each type of required investigation, including the proportion of the entire MS4 system that has been inspected.

Table 2-4: Fieldwork Timeline

Investigation Task	Required Number of Investigations	Status	Previously Completed Investigations	Permit Year 8 (2025-2026)	Permit Year 9 (2026-2027)	Permit Year 10 (2027-2028)	Total Inspections Remaining
Outfall Screening	101	Complete	103*	5*	-	-	0
Wet Weather Outfall Screening	101	63%	64	37	35	35	-
Catchment Investigations	101	30%	30	25	25	21	71

*The City screened all known outfalls by the end of PY 6, which includes outfalls that were removed from the MS4 inventory in PY 7. Five (5) outfalls were added to the MS4 inventory in PY 7, and they will need to be screened in PY 8.

Note that the wet weather screening must be completed once every three (3) years; thus, each year approximately 1/3 of the outfalls will be screened. While the schedule outlined in Table 2-4 is through 2028, which is the final year of the current MS4 Permit, the Permit is expected to be renewed and the sampling will continue.

In PY 8, the City will further investigate three (3) catchments that were found to have high bacteria during the catchment investigations. These are associated with Outfall CA086, Outfall CA068, and Outfall CA071. Additionally, the City will continue wet weather screenings of all outfalls. Holyoke will also continue catchment investigations on pace with the timeline established above.

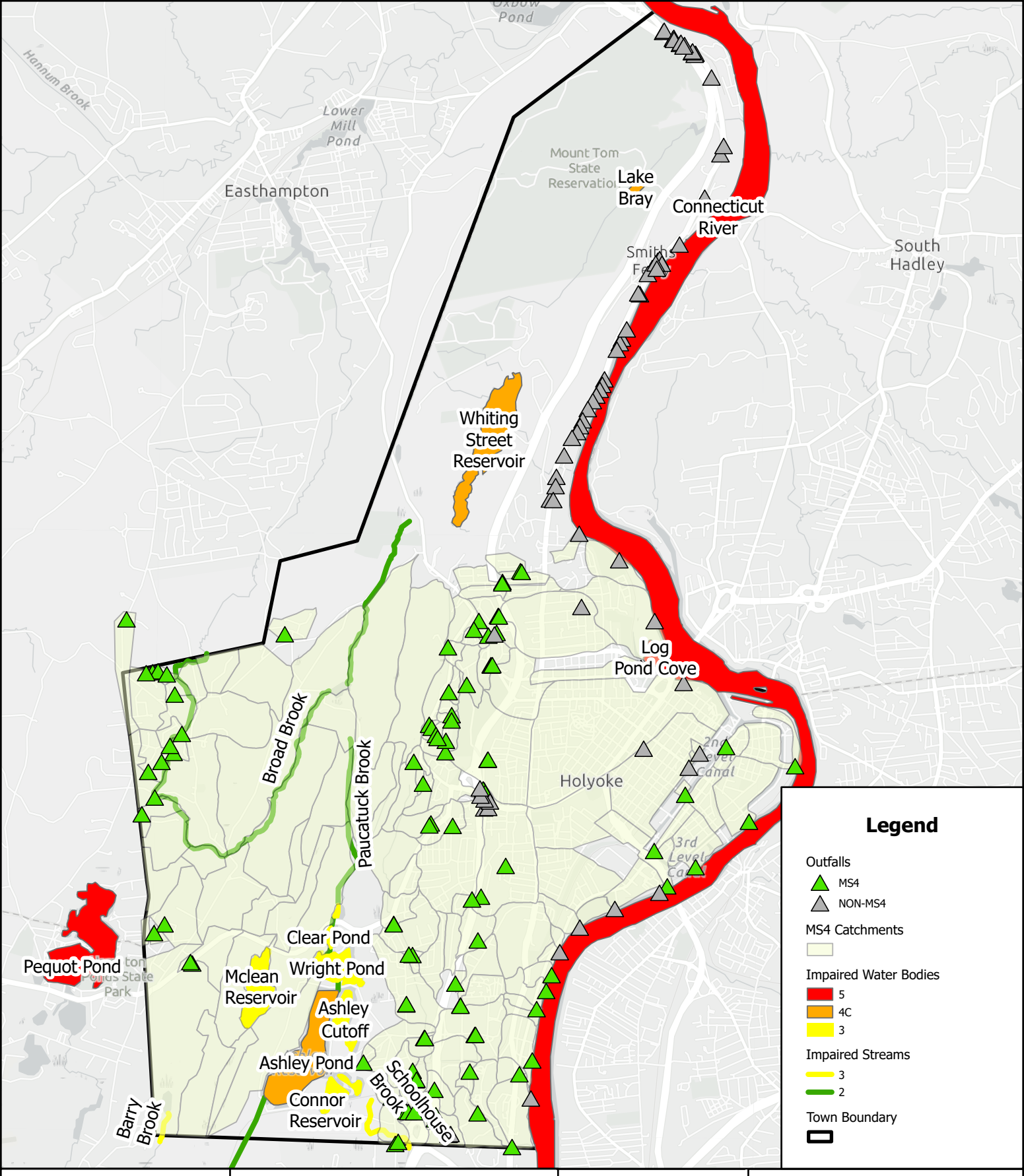
After all of the categorized catchment investigations are completed, each outfall or interconnection will be reprioritized for screening once every five (5) years per the CD. Ongoing screening will consist of dry weather screening and sampling and wet weather screening and sampling of all outfalls.

3 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

APPENDIX A

STORMWATER SYSTEM MAP



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0 3,000 6,000 Feet

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PROJECT NO.	25002430.001A
CREATED:	6/25/2025
CREATED BY:	PFreeman
FILE NAME:	Holyoke_StormMap_FY25.aprx

Storm System Map

City of Holyoke
122 Middle Water Street
Holyoke, MA 01040

APPENDIX B

REPRIORITIZED OUTFALL INVENTORY

Reprioritized Outfall Inventory

Illicit Discharge Detection and Elimination (IDDE) Program

City of Holyoke, Massachusetts

Revised: June 2025

Outfall ID	Priority
CA045	Problem
CA046	Problem
CA047-A	Problem
CA047-B	Problem
CA049	Problem
CA052	Problem
CA053	Problem
CA064	Problem
CA065	Problem
CA066	Problem
CA068	Problem
CA071	Problem
CA086	Problem
CA132	Problem
CA142	Problem
CA143	Problem
CA003	High
CA004	High
CA005-A	High
CA005-B	High
CA005-C	High
CA005-E	High
CA006-A	High
CA006-B	High
CA006-C	High
CA006-D	High
CA007	High
CA009	High
CA010	High
CA011	High
CA012	High
CA013	High
CA014	High
CA015	High
CA016	High
CA017	High
CA018	High
CA023-B	High
CA023-C	High
CA027	High
CA035-A	High
CA042	High
CA048	High

Reprioritized Outfall Inventory

Illicit Discharge Detection and Elimination (IDDE) Program

City of Holyoke, Massachusetts

Revised: June 2025

Outfall ID	Priority
CA050	High
CA051	High
CA054	High
CA055	High
CA056	High
CA057-B	High
CA060	High
CA067	High
CA070	High
CA072	High
CA078-A	High
CA078-B	High
CA084	High
CA085	High
CA087	High
CA133-A	High
CA133-B	High
CA134	High
CA135	High
CA144	High
CA147	High
CA002	Low
CA008	Low
CA019	Low
CA026	Low
CA034	Low
CA058	Low
CA059	Low
CA062	Low
CA088	Low
CA089	Low
CA091-A	Low
CA091-B	Low
CA094	Low
CA096-A	Low
CA096-B	Low
CA098	Low
CA099	Low
CA100	Low
CA101-A	Low
CA101-B	Low
CA102	Low
CA103	Low

Reprioritized Outfall Inventory

Illicit Discharge Detection and Elimination (IDDE) Program

City of Holyoke, Massachusetts

Revised: June 2025

Outfall ID	Priority
CA105	Low
CA122	Low
CA128	Low
CA137	Low
CA138	Low
CA139	Low
CA140	Low
CA141	Low
CA145	Low
CA146	Low
CA035	Not Yet Prioritized
CA038	Not Yet Prioritized
CA064-B	Not Yet Prioritized
CA08-B	Not Yet Prioritized
CA158	Not Yet Prioritized

APPENDIX C

FIELD INVESTIGATION RECORDS

FY25 Catchment Investigation Field Records

Illicit Discharge Detection and Elimination (IDDE) Program

City of Holyoke, Massachusetts

Outfall ID	Structure Type	Structure ID	Priority	Was there flow?	Was a sample collected?	Ammonia (mg/l)	Surfactants (mg/l)	Chlorine (mg/l)	Conductivity (microsiemens/s)	Salinity	E. coli Presence	E. coli (MPN/100 ml)	Date of Inspection
CA026	**Outfall**	**CA026**	**Low**	**Yes**	**Yes**	**0**	**-**	**-**	**-**	**Yes**	**Yes**	**17**	**10/18/2024**
CA068	**Outfall**	**CA068**	**Problem**	**Yes**	**Yes**	**3**	**-**	**-**	**-**	**-**	**-**	**-**	**10/23/2024**
CA068	Manhole	DMH-068_0003	Problem	Yes	No	-	-	-	-	-	-	-	10/23/2024
CA068	Manhole	DMH-068_0004	Problem	Yes	Yes	1	0.15	0	730	0.4	Yes	>410	10/23/2024
CA068	Manhole	DMH-068_0018	Problem	Yes	Yes	0	0.15	0	128.5	0.1	No	<Null>	4/16/2025
CA085	**Outfall**	**CA085**	**High**	**Yes**	**No**	**0**	**-**	**-**	**-**	**-**	**-**	**-**	**11/5/2024**
CA085	Manhole	DMH-085_0025	High	No	No	-	-	-	-	-	-	-	4/16/2025
CA071	**Outfall**	**CA071**	**Problem**	**Yes**	**No**	**0**	**-**	**-**	**-**	**-**	**-**	**-**	**11/13/2024**
CA071	Manhole	DMH-071_0017	Problem	Yes	Yes	0	0.15	0	566	0.4	Yes	629	11/13/2024
CA035-A	**Outfall**	**CA035-A**	**High**	**No**	**No**	-	-	-	-	-	-	-	**11/5/2024**
CA084-A	**Outfall**	**CA084-A**	**Unknown**	**Yes**	**Yes**	**0.25**	**0.15**	**0**	**592**	**0.4**	**Yes**	**>410**	**10/29/2024**
CA086*	**Outfall**	**CA086**	**Problem**	**Yes**	**Yes**	**6**	**0.5**	**0**	**631**	**0.5**	**-**	**-**	**10/30/2024**
CA086	Manhole	DMH-086_0089	Problem	Yes	No	N/A							10/29/2024
CA086	Manhole	DMH-086_0045	Problem	Yes	No	N/A							10/29/2024
CA086	Manhole	DMH-086_0045	Problem	Yes	No	N/A							10/29/2024
CA086	Manhole	DMH-086_0100	Problem	Yes	Yes	3	1	0	694	0.4	Yes	>410	11/4/2024
CA086	Manhole	DMH-086_0101	Problem	Yes	No	N/A							11/1/2024
CA086	Manhole	DMH-086_0089	Problem	Yes	No	N/A							10/29/2024
CA086	Manhole	DMH-086_0044	Problem	Yes	No	N/A							10/29/2024
CA086	Manhole	DMH-086_0086	Problem	Yes	No	N/A							10/29/2024
CA086	Manhole	DMH-086_0092	Problem	Yes	No	N/A							10/29/2024
CA086	Manhole	DMH-086_0080	Problem	Yes	No	N/A							10/29/2024
CA038	**Outfall**	**CA038**	**Unknown**	**No**	**No**	-	-	-	-	-	-	-	**11/7/2024**
CA143	**Outfall**	**CA143**	**Problem**	**Yes**	**Yes**	**0**	**0.1**	**0**	**405.2**	**0.2**	**-**	**-**	**11/7/2024**
CA062	**Outfall**	**CA062**	**Low**	**Yes**	**Yes**	**0**	**0.15**	**0**	**710**	**0.4**	**Yes**	**8**	**11/5/2024**
CA073	**Outfall**	**CA073**	**Problem**	**Yes**	**Yes**	**0**	**0**	**0**	**722**	**0.4**	**-**	**-**	**11/7/2024**
CA073	Manhole	DMH-073_0013	Problem	Yes	Yes	0	0	0	732	0.4	-	-	11/7/2024
CA005	Manhole	DMH-005_0008	Unknown	Yes	Yes	0	0.12	0	568	0.4	-	-	10/17/2024
CA132	Manhole	DMH-132_0001	Problem	Yes	Yes	0	0	0	40.2	0	No	0	10/18/2024
CA059	Manhole	DMH-059_0001	Low	Yes	Yes	0	0.12	0	96.5	0.6	Yes	60	10/22/2024

*Cells highlighted in red indicate that the structure's flow tested above the EPA threshold for E. coli, which is greater than or equal to 410 MPN/100 ml.

FY25 Wet Weather Outfall Screening Records

Illicit Discharge Detection and Elimination (IDDE) Program

City of Holyoke, Massachusetts

Outfall ID	Priority	Was there flow?	Ammonia (mg/l)	Chlorine (mg/l)	Surfactants (mg/l)	E. coli* (MPN/100 ml)	Date of Inspection
CA005-A	High	Yes	0	0	0.15	12	4/26/2025
CA005-B	High	Yes	0	0	0.15	30	4/26/2025
CA005-C	High	Yes	0	0	0.15	60	4/26/2025
CA007	High	Yes	0	0	0.15	40	5/6/2025
CA009	High	Yes	0	0	0.15	>411	11/21/2024
CA010	High	Yes	0	0	0.15	>411	5/22/2025
CA011	High	Yes	0	0	0.15	>411	12/11/2024
CA012	High	Yes	0	0	0.15	>411	11/21/2024
CA013	High	Yes	0	0	0.75	>411	11/21/2024
CA016	High	Yes	0	0	0.15	>411	12/11/2024
CA017	High	Yes	0	0	0.15	>411	12/11/2024
CA018	High	Yes	0	0	0	>411	5/6/2025
CA035-A	High	Yes	0	0	0.15	>411	3/6/2025
CA037	High	Yes	1	0	3	>411	11/21/2024
CA060	High	Yes	0	0	0.15	>411	5/22/2025
CA078-A	High	Yes	0	0	0.15	122	3/6/2025
CA078-B	High	Yes	0	0	0.15	100	3/6/2025
CA133-A	High	Yes	0	0	0.5	26	4/26/2025
CA133-B	High	Yes	0	0	0.25	36	4/26/2025
CA134	High	Yes	0	0	0.15	25	4/26/2025
CA135	High	Yes	0	0	0.25	20	4/26/2025
CA144	High	Yes	0	0	0.15	>411	5/6/2025
CA008	Low	Yes	0	0	0.15	84	5/6/2025
CA019	Low	Yes	0	0	0	>411	12/11/2024
CA034	Low	Yes	0	0	0.15	>411	5/22/2025
CA059	Low	Yes	0	0	0.15	>411	5/22/2025
CA088	Low	Yes	0	0	0.15	191	12/11/2024
CA089	Low	Yes	0	0	0.15	53	12/11/2024
CA091-B	Low	Yes	0	0	0.75	>411	12/11/2024
CA094	Low	Yes	0	0	0.5	>411	11/21/2024
CA096-A	Low	Yes	0	0	0.15	>411	11/21/2024
CA099	Low	Yes	0.5	0	0.15	>411	11/21/2024
CA100	Low	Yes	0.5	0	0.5	>411	11/21/2024
CA105	Low	Yes	0.15	0	0.15	>411	11/21/2024
CA122	Low	Yes	0	0	0.5	>411	11/21/2024
CA137	Low	Yes	0	0	0.15	>411	5/6/2025
CA139	Low	Yes	0	0	0.15	>411	11/21/2024
CA140	Low	Yes	0	0	0.5	>411	11/21/2024
CA141	Low	Yes	0	0	0.15	>411	5/22/2025
CA146	Low	Yes	0	0	0.15	>411	5/22/2025
CA038	Unknown	Yes	0.5	0	0.5	>411	11/21/2024

*Cells highlighted in red indicate that the structure's flow tested above the EPA threshold for E. coli, which is greater than or equal to 410 MPN/100 ml.

APPENDIX D

ILLICIT DISCHARGE DETECTION AND ELIMINATION (IDDE) PROGRAM REQUIREMENTS

ILLICIT DISCHARGE DETECTION AND ELIMINATION (IDDE) PROGRAM REQUIREMENTS

CITY OF HOLYOKE, MASSACHUSETTS

JUNE 2025

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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 MS4discharges 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 City of Holyoke.

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).

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 REQUIREMENTS

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 (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" or "CD."

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 system and implement procedures to prevent such discharges. The IDDE program must be recorded in a written document. In PY 7, IDDE documentation has been restructured. This IDDE Program Requirements document has been prepared to address part of the MCM 3 requirement; this document includes methodologies and requirements under the MS4 Permit that tends to remain the same annually. This document is appended as Appendix D to a new document, the IDDE Program Supplemental Update document. Each year, the IDDE Program

Supplemental Update document will provide updates on mapping, prioritization, SSOs, and all fieldwork activities for the current permit year.

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.

The required timeline for implementing the IDDE program is included in Appendix A of this document.

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. A copy of the 2023 Consent Decree is included in Appendix B. Table 1-1 ties sections of this IDDE Program to the 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	IDDE Program Supplemental Update: Appendix A - Stormwater System Map
12b	Identification of all combined manholes within MS4 catchment areas	IDDE Program Supplemental Update: Appendix B – Reprioritized Outfall Inventory
12c	Schedule to inspect all identified combined manholes	Appendix A - Investigation Timeline and Procedure and IDDE Program Supplemental Update: Table 2-4
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	IDDE Program Supplemental Update: Appendix B – Reprioritized Outfall Inventory
13	Dry-Weather Sampling	IDDE Program Supplemental Update
14	Wet-Weather Sampling	IDDE Program Supplemental Update
15a-15c	Identification and Elimination of Illicit Discharges to MS4 area with schedule for actions	IDDE Program Supplemental Update
17	Semi-annual Consent Decree compliance report relating to implementation of IDDE Plan (Due 7/31/2025)	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 the U.S.EPA as requiring a permit. The urbanized areas for Holyoke are shown in Figure 1-1.

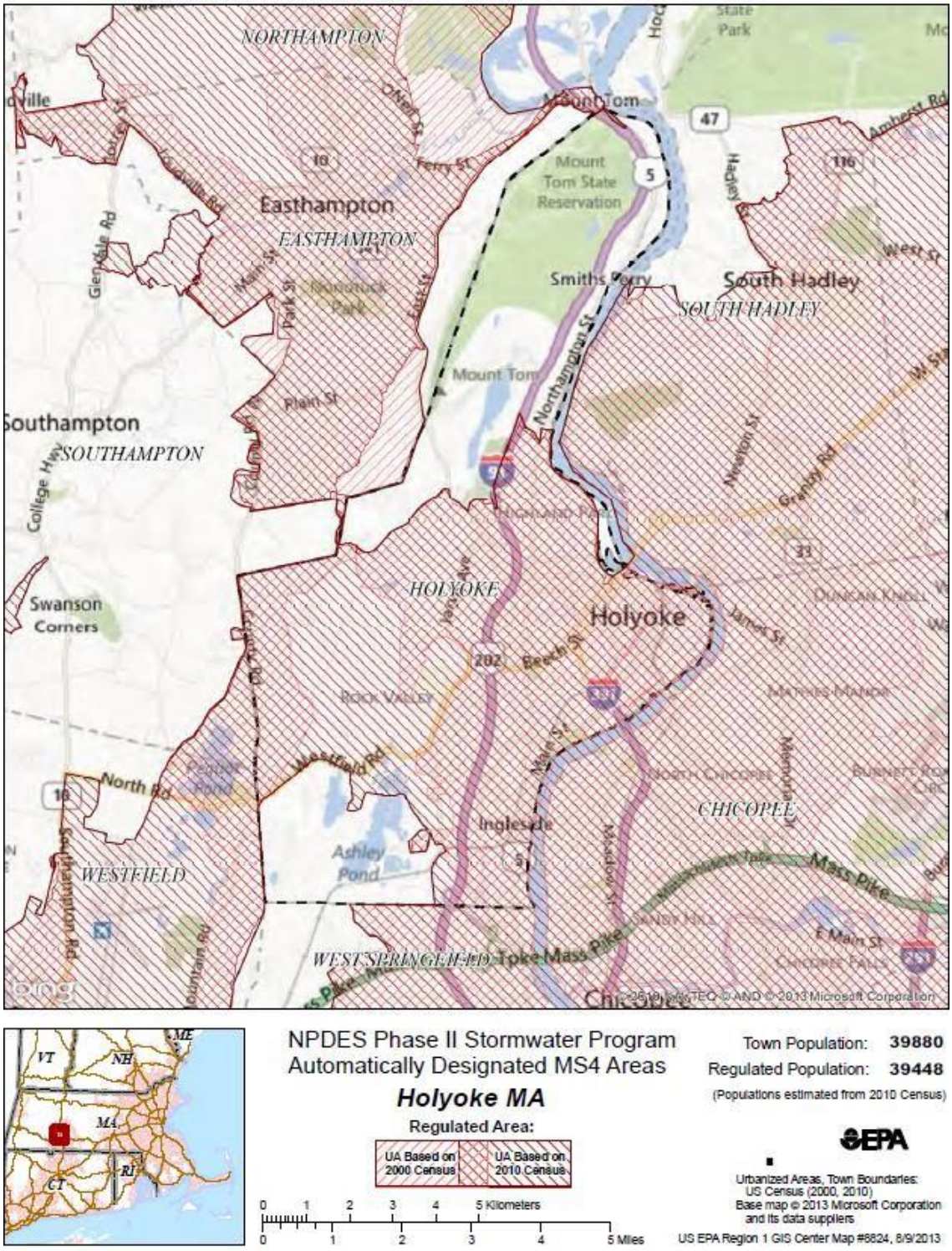

Figure 1-1: Holyoke MS4 Urbanized Area

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.

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

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 C. The draft ordinance language, proposed by the Pioneer Valley Planning Commission (PVPC), is also included in Appendix C.

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; Stormwater Coordinator	• Enforcement of illicit discharge (ID) procedures and actions
VEOLIA Project Leader; 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 Leader	• 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 Leader
Jason Swain
Veolia
(413) 534-2222

Veolia Regional Manager
Mike Williams
Veolia

Stormwater Coordinator
Miira Gates
Public Works (DPW)
(413) 588-6897

Holyoke Department of Public Works Interim Director
Mary L. Monahan
Public Works (DPW)
(413) 322-5645

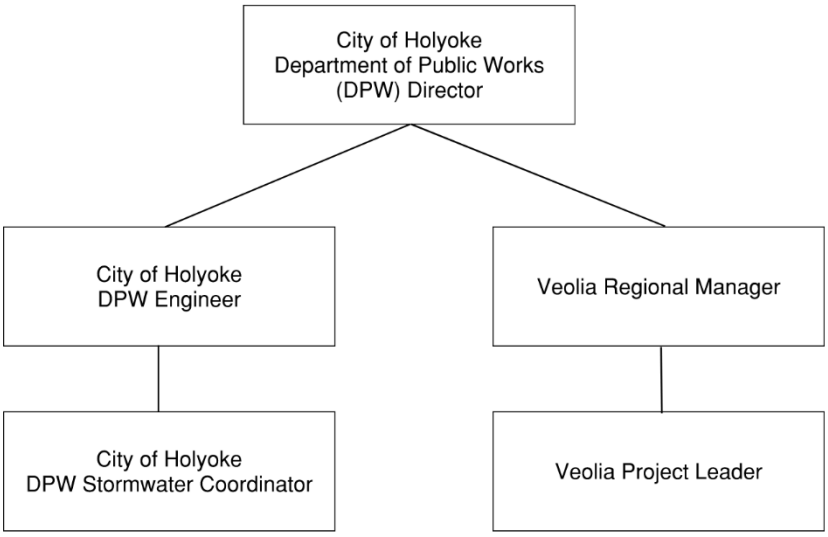

Figure 2-1: Organizational Structure

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 the IDDE Program Supplemental Update document. The Stormwater System Map includes outfalls categorized by MS4 status, receiving water bodies, and preliminary catchment delineations.

The City has continued to work 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 since the start of the Permit 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 5.4 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 projects 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. Holyoke will continue to make 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

Holyoke has interconnections consisting of drainage from private developments, State CSOs, and other drainage tied into the City's MS4. Interconnections will continue to be identified and mapped as investigations continue.

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 MS4 Annual Report. Updates to the SSO inventory are summarized in the IDDE Program Supplemental Update. The SSO inventory only includes SSOs that have occurred in the previous five (5) permit years.

4.2 REMOVAL AND NOTIFICATION

Upon detecting or receiving notice of an SSO, the City eliminates it as soon as possible and takes interim mitigation steps to minimize the discharge of pollutants to the MS4 until the SSO is eliminated. Holyoke must provide oral notification to 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

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

Beyond the MS4 reporting requirements, the City is also required to comply with newly issued 314 CMR 16 that specifies how and when the public must be notified of SSOs.

Refer to the inventory of observed and reported SSOs in the IDDE Program Supplemental Update Document. The SSO inventory will be included in the Annual Report, including the status of mitigation and corrective measures to address each identified SSO.

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 the IDDE Program Supplemental Update document. Further refined delineations will be completed as catchment investigations continue.

5.3 PRELIMINARY RANKING OF OUTFALLS AND INTERCONNECTIONS

PY 5's inventory of 67 outfalls was given a preliminary ranking based on the receiving water body and whether the outfalls 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 the IDDE Program Supplemental Update) 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 other outfalls identified during field investigation and mapping efforts in PY 6, were incorporated into the reprioritization.

As seen in Table 5-1

EPA Priority Category	Description
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.
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
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.
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.

, 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.

The reprioritization was based on a two-tier ranking and categorization system, adapted from the Neponset Reprioritization Tool. If an outfall was automatically triggered to be a Problem outfall based on likely sewer input, it did not receive an outfall score because the investigation of catchments associated with any Problem outfall must be prioritized first. 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, 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.

Table 5-1: EPA Priority Categorization of Outfalls

EPA Priority Category	Description
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.
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
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.
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.

6 DRY WEATHER OUTFALL AND INTERCONNECTION SCREENING AND SAMPLING

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).
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.
8. 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.
9. 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.
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. Replace and tighten sample container lids immediately after sample collection.
13. Place laboratory samples on ice for analysis of bacteria and pollutants of concern.
14. Accurately label the sample with the time and location.
15. 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 E for field inspection forms). This creates a reference point for samples.
16. Fill out chain-of-custody form for laboratory samples.

17. 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.
18. 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.
19. Decontaminate all testing personnel and equipment.

Veolia manages a laboratory at the City's wastewater treatment plant where samples are analyzed for parameters not tested using field instrumentation. It is recommended that even though the laboratory is also managed by Veolia, a chain-of-custody form also be filled out and accompany any samples that require analysis for record keeping purposes.

Table 6-3 includes field equipment commonly used for outfall screening and sampling. The City has contracted with Veolia for field investigations and testing. Testing is conducted in situ (at the location of the outfall) using field kits and using lab instruments in the wastewater treatment plant laboratory that have been calibrated to accurately measure analytes in the range of the threshold concentrations. In addition, each analyte is measured using the analytical method specified in Appendix G of the 2016 MS4 General Permit. Maximum holding times and appropriate preservation methods are required and should be communicated to the laboratory to ensure compliance with the Permit. This information is summarized in Table 6-4. 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.

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
Fecal Coliform	≥ 410 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.

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.

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 have begun no later than June 30th, 2020, and that all catchments affiliated with problem outfalls be investigated by June 30th, 2025. Catchment investigations affiliated with all the other high and low priority outfalls must be completed by June 30th, 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.
2. When possible, condition information and measured elevation of the manhole rim as well as the invert depth should be recorded.
3. If flows are observed, the inlet and outlet direction of the flow should be recorded.
4. 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.
5. 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 Sample Collection and Testing for information on when to take E. Coli bacteria samples. Refer to Table 10 for threshold limits for each analyte.

6. 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.
7. 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.
8. 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. According to the CD, wet weather conditions are defined as at least 0.25-inches of rain over a 24-hour period prior to sampling occurring.

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).

Refer to the IDDE Program Supplemental Update for wet weather outfall screening progress updates.

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 Coordinator 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, the City 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.

8 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 H and included in the annual report.

9 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.

10 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

APPENDIX A

INVESTIGATION TIMELINE AND PROCEDURE

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

CONSENT DECREE (2023)

UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF MASSACHUSETTS

UNITED STATES OF AMERICA, Plaintiff, COMMONWEALTH OF MASSACHUSETTS, Plaintiff-Intervenor, v. CITY OF HOLYOKE, MASSACHUSETTS, Defendant.	CASE NO. 19-cv-10332-MGM

FINAL CONSENT DECREE

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WHEREAS, on May 22, 2019, the Court entered a Partial Consent Decree (hereinafter referred to as "2019 Partial Decree") settling claims of the Plaintiffs the United States of America ("United States"), on behalf of the United States Environmental Protection Agency ("EPA"), and Commonwealth of Massachusetts ("Commonwealth"), on behalf of the Massachusetts Department of Environmental Protection ("MassDEP"), against the Defendant the City of Holyoke, Massachusetts (the "City") (together, the United States, the Commonwealth, and the City are the "Parties"), for alleged violations of the City's National Pollutant Discharge Elimination System ("NPDES") Permit No. 0101630 and Section 301(a) of the federal Clean Water Act ("CWA"), 33 U.S.C. § 1311(a), and for the alleged violations of the City's Massachusetts Permit No. 0101630, and the Massachusetts Clean Waters Act ("Massachusetts Act"), M.G.L. c. 21, §§ 26, *et seq*., for the discharge of pollutants into waters of the United States from the City's publicly owned treatment works (the "POTW"), as defined at 40 C.F.R. § 403.3, which includes a wastewater treatment plant located at One Berkshire Street, Holyoke, Massachusetts (the "WWTP") and collection system (the "Collection System");

WHEREAS the United States and Commonwealth had alleged violations consisting of, among other things: (i) discharging pollutants during wet and dry periods from combined sewer overflows ("CSOs") in the City's Collection System that caused or contributed to water quality violations in the Connecticut River; and (ii) discharging pollutants from other unpermitted components of the City's Collection System to the Connecticut River;

WHEREAS, the framework for compliance with CWA requirements for CSOs is set forth in Section 402(q)(1) of the CWA, 33 U.S.C. § 1342(q)(1) ("CSO Control Policy");

WHEREAS, the CSO Control Policy sets forth the following objectives: (1) to ensure that, if CSO discharges occur, they are only as a result of wet weather; (2) to bring all wet

weather CSO discharges into compliance with the technology-based and water-quality based requirements of the CWA; and (3) to minimize water quality, aquatic biota, and human health impacts from CSO flows;

WHEREAS, the CSO Control Policy sets forth nine minimum controls, including the prohibition of dry weather overflows from CSOs, as a minimum best available technology economically achievable and best conventional technology established on a best professional judgment basis for CSO control;

WHEREAS, under the 2019 Partial Decree, the City agreed to prepare and submit an approvable updated CSO long term control plan ("Updated CSO LTCP");

WHEREAS, under the 2019 Partial Decree, upon approval of the Updated CSO LTCP, the Parties were to negotiate the remedial work to be completed on the City's Collection System;

WHEREAS, under Paragraph 12 of the 2019 Partial Decree, any approved final remedy and schedule, and any necessary related measures, of the Updated CSO LTCP would be "incorporated into, and shall be an enforceable part of, a modification of [the 2019 Partial Decree] … or shall be incorporated into a new consent decree."

WHEREAS, on April 4, 2016, EPA reissued a NPDES General Permit for Stormwater Discharges from Small Municipal Separate Storm Sewer Systems ("Small MS4 General Permit") under CWA section 402(p), 33 U.S.C. § 1342(p), for which Holyoke applied and under which it received coverage;

WHEREAS, the United States' Complaint against the City alleges that the City violated and continues to violate Section 301 of the CWA by discharging pollutants into waters of the United States from its municipal separate storm sewer system ("MS4") drains without authorization under the Small MS4 General Permit, any other NPDES permit, or any other provision of the Act;

WHEREAS, under Paragraph 48 of the 2019 Partial Decree, the Plaintiffs did not resolve and retained, without prejudice, the right to seek further relief to address the claims in the Complaints of the Plaintiffs, or any future claims, including the right to obtain civil penalties, which are addressed in this Final Consent Decree (hereafter "Consent Decree" or "Decree");

WHEREAS, the Parties recognize, without admission of facts or law by the City except as may be expressly stated herein, and the Court by entering this Consent Decree finds, that this Consent Decree has been negotiated by the Parties in good faith and will avoid additional litigation among the Parties, and that this Consent Decree is fair, reasonable, and in the public interest;

NOW, THEREFORE, with the consent of the Parties, IT IS HEREBY ADJUDGED, ORDERED, AND DECREED as follows:

I. STATEMENT OF CLAIM

1. The separate Complaints of the United States and the Commonwealth state claims upon which relief can be granted against the City pursuant to Section 309 of the CWA, 33 U.S.C. § 1319, and, with respect to the Commonwealth's Complaint, pursuant to the Massachusetts Clean Waters Act, M.G.L. c. 21, §§ 42, 43, and 46.

II. JURISDICTION AND VENUE

2. This Court has jurisdiction over the subject matter of this action pursuant to Section 309(b) of the CWA, 33 U.S.C. § 1319(b), and 28 U.S.C. §§ 1331, 1345, 1355, and 1367(a). This Court has personal jurisdiction over the Parties to this Consent Decree. Venue properly lies in this district pursuant to Section 309(b) of the CWA, 33 U.S.C. § 1319(b), and 28 U.S.C. §§ 1391(b) and (c). The City waives all objections it might have raised to such jurisdiction or venue.

III. APPLICABILITY

3. The provisions of this Consent Decree shall apply to and be binding upon the United States, the Commonwealth, and upon the City and any successors, and assigns, or other entities or persons otherwise bound by law.

4. No transfer of any ownership interest in or any interest in the operation of the WWTP or Collection System, whether in compliance with this Paragraph or otherwise, shall relieve the City of its obligation to ensure that the terms of this Consent Decree are implemented unless (1) the transferee agrees to undertake the obligations required by this Decree and to be substituted for the City as a Party under this Decree and thus be bound by its terms, and (2) the United States and Commonwealth consent in writing to relieve the City of its obligations. At least 30 Days prior to such transfer, the City shall provide a copy of this Consent Decree to the proposed transferee and shall simultaneously provide written notice of the prospective transfer, together with a copy of the above-referenced proposed written agreement, to EPA, the United States Attorney for the District of Massachusetts, the United States Department of Justice, and MassDEP, in accordance with Section XIV, below (Form of Notice). Any noncompliance with this Paragraph constitutes a violation of this Consent Decree. The United States' decision to refuse to approve the substitution of the transferee for the City shall not be subject to judicial review.

5. The City shall provide a copy of this Consent Decree to all officers, employees, and agents whose duties might reasonably include compliance with any provisions of this Consent Decree. The City shall also provide a copy of this Consent Decree to all contractors and consultants (including engineering firms) retained to perform any obligation required by this Consent Decree on behalf of the City and condition any such contract upon performance of the

work in conformity with the terms of this Consent Decree. The City shall require that such contractors and consultants provide a copy of this Consent Decree to their subcontractors to the extent the subcontractors are performing work subject to this Consent Decree. Such contractors, consultants and subcontractors shall be deemed agents of the City for the purposes of this Consent Decree. The City shall condition any such contract upon performance of the work in conformity with the terms of this Consent Decree.

6. In an action to enforce this Consent Decree, the City shall not assert as a defense the failure by any of its officers, directors, employees, agents, or contractors to take any actions necessary to comply with the provisions of this Consent Decree.

IV. DEFINITIONS

7. Unless otherwise expressly provided herein, terms used in this Consent Decree which are defined in the CWA or in regulations promulgated under the CWA shall have the meaning ascribed to them in the CWA or in the regulations promulgated thereunder. Whenever the terms listed below are used in this Consent Decree, the following definitions shall apply:

a. "Effective Date" shall have the definition provided in Section XVII (Effective Date).

b. "Catchment" shall mean the geographical area served by and drained to a distinct portion of the City's MS4.

c. "Clean Water Act" or "CWA" shall mean the Federal Water Pollution Control Act (commonly referred to as the Clean Water Act), as amended, 33 U.S.C. §§ 1251, *et seq*. The "Massachusetts Clean Waters Act" or the "Massachusetts Act" shall mean the Massachusetts Clean Waters Act, as amended, M.G.L. c. 21, §§ 26-53.

d. "Collection System" shall mean the wastewater (domestic, commercial, and

industrial) collection, storage and transmission system (including, but not limited to, all pipes, siphons, devices, pump stations, force mains, gravity sewer lines, manholes, and appurtenances thereto) that is owned or operated by the City of Holyoke, at any time from the Effective Date of this Consent Decree until its termination under Section XXI (Termination), and that is designed to collect and convey municipal sewage to the WWTP.

e. "Combined Sewer Overflow" or "CSO" shall mean a discharge from the Combined Sewer System at a CSO outfall designated in the City's Permit.

f. "Combined Sewer System" or "CSS" shall mean the pipelines, pumping stations, treatment facilities, and appurtenances in the Collection System that are designed to convey wastewater and stormwater through a single pipe system to the WWTP and/or CSO outfalls.

g. "Commonwealth" shall mean the Commonwealth of Massachusetts.

h. "Complaints" shall mean the complaints filed by the United States and the Commonwealth respectively in this action.

i. "Consent Decree" or "Decree" shall mean this Final Consent Decree and all appendices attached hereto. In the event of conflict between this Final Consent Decree and any appendix, this Final Consent Decree shall control.

j. "Date of Lodging" shall mean the Day this Consent Decree is filed for lodging with the Clerk of the Court for the United States District Court for the District of Massachusetts.

k. "Day(s)" or "day(s)" shall mean a calendar day. In computing any period of time under this Consent Decree, where the last day would fall on a Saturday, Sunday, or Federal

or Commonwealth holiday, the period shall run until the close of business of the next business day.

l. "EPA" shall mean the United States Environmental Protection Agency and any successor departments or agencies of the United States.

m. "MassDEP" shall mean the Massachusetts Department of Environmental Protection and any successor departments or agencies of the Commonwealth.

n. "Paragraph" shall mean a portion of this Consent Decree identified by an Arabic numeral, a lower-case letter, or a lower-case Roman numeral.

o. "Parties" shall mean the United States, the Commonwealth, and the City of Holyoke, Massachusetts.

p. "Permit" or "NPDES Permit" shall mean NPDES Permit No. 0101630, issued on September 1, 2009, and reissued on October 25, 2016, and effective January 1, 2017, or any subsequently modified or reissued permit.

q. "Section" shall mean a portion of this Consent Decree identified by an upper case Roman numeral.

r. "United States" and "U.S." shall mean the United States of America.

s. "Wastewater Treatment Plant" or "WWTP" shall mean the wastewater treatment plant owned by the City of Holyoke, and all components of such wastewater treatment plant.

V. OBJECTIVES

8. It is the express purpose of the Parties in entering into this Consent Decree to require the City to take measures necessary to fulfill the objectives of the CWA, and to achieve

and maintain compliance with the CWA, the Massachusetts Act, the Permit, and any applicable Federal and State regulations.

9. All work pursuant to this Consent Decree shall be performed using sound, generally accepted engineering practices to ensure that construction, management, operation, and maintenance of the Collection System complies with the CWA, including consideration of practices to improve the resilience of the Collection System. Engineering designs and analyses required to be performed pursuant to this Consent Decree shall be conducted using sound engineering practices, and, to the extent they are applicable, shall be consistent with: (a) EPA's "Handbook: Sewer System Infrastructure Analysis and Rehabilitation," EPA/625/6-91/030, October 1991, or as amended; (b) EPA's "Handbook for Sewer System Evaluation and Rehabilitation," EPA/430/9-75/021, December 1975; (c) "Existing Sewer Evaluation and Rehabilitation," WEF MOP FD-6, 2009, or as amended; (d) "Guide to Short Term Flow Surveys of Sewer Systems," WRC Engineering (Undated); (e) the National Association of Sewer Service Companies' "Manual of Practice"; (f) MassDEP's "Guidelines for Performing Infiltration/Inflow Analyses and Sewer System Evaluation Survey," revised May 2017, or as amended; (g) New England Interstate Water Pollution Control Commission's TR-16 "Guides for the Design of Wastewater Treatment Works," as revised in 2016, or currently effective edition; (h) EPA's "Computer Tools for Sanitary Sewer System Capacity Analysis and Planning," EPA/600/R-07/111, October 2007, or as amended; (i) EPA's Creating Resilient Water Utilities (CRWU) Initiative, available on the EPA-maintained website at https://www.epa.gov/crwu; (j) EPA's Climate Resilience Evaluation and Awareness Tool (CREAT), version 3.0, referenced at EPA 815-B-16-004, May 2016, available on the EPA-maintained website at https://www.epa.gov/crwu/build-resilience-your-utility; and (k) the Commonwealth's Executive

Order No. 569 (Establishing an Integrated Climate Change Strategy for the Commonwealth), dated September 16, 2016. Should there be a conflict between two or more of these sources, EPA's judgment, after consultation with MassDEP, as to which source to follow shall control.

VI. REMEDIAL MEASURES

Combined Sewer Overflow

10. The City shall implement the Updated CSO LTCP submitted on December 30, 2019 (Appendix A), as modified by the City's April 4, 2022, email to EPA and the MassDEP (Appendix B), and any subsequent modifications or revisions thereto approved pursuant to this Consent Decree (including the design and schedule to remove Day Brook from the collection system), in accordance with the schedule therein, except that the following specific elements of the Updated CSO LTCP shall be implemented according to the following schedule:

a. On or before December 31, 2022, the City shall complete construction of the Springdale Pond drain-relocation project (part of CSO Area 8);

b. On or before July 1, 2024, the City shall submit for approval by MassDEP design plans for the River Terrace (CSO Area 21A) remedial projects;

c. On or before July 1, 2026, the City shall submit for approval by MassDEP design plans for the River Terrace (CSO Area 21B) remedial projects;

d. On or before December 31, 2027, the City shall complete the River Terrace (CSO Area 21A) projects, in accordance with design plans approved by MassDEP;

e. On or before December 31, 2029, the City shall complete the River Terrace (CSO Area 21B) projects, in accordance with design plans approved by MassDEP;

f. On or before July 1, 2034, the City shall submit for approval by MassDEP design plans for the Springdale Park (CSO Area 8) remedial projects; and

g. On or before December 31, 2037, the City shall complete the Springdale Park (CSO Area 8) project, in accordance with the design plans approved by MassDEP.

Illicit Discharge Detection and Elimination

11. The City shall inspect and sample its MS4 outfalls, and MS4 discharges to other municipal MS4s or non-City owned outfalls, in accordance with the requirements below. The City shall utilize the following IDDE screening thresholds as guidelines for its analysis of the data generated for each field sample to include:

Bacteria:	Class A or B waters – *E. coli*: equal to or greater than 410 colony forming units /100 milliliters ("cfu/100 ml") and/or *Enterococcus*: equal to or greater than 130 cfu/100 ml
Surfactants:	equal to or greater than 0.25 milligrams per liter ("mg/l") via field kits or 0.1 mg/l via laboratory analysis
Ammonia:	equal to or greater than 0.5 mg/l via field kits or 0.1 mg/l via laboratory analysis
Chlorine:	equal to or greater than 0.02 mg/l

The following indicators, i.e., subparagraphs a. through e., shall constitute the detection of what shall hereby be referred to as a "Potential Illicit Discharge" and shall be used to prioritize the investigation of the catchment areas associated with the outfalls and interconnections:

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.

An exceedance of a bacterial threshold specified in this paragraph 11 without meeting an indicator described in subparagraphs a., b., c., d., or e., above, may also indicate an illicit discharge that shall, at a minimum, be addressed by "Best Management Practices" as specified in the Consent Decree.

12. By May 31, 2023, the City shall submit to EPA for review an IDDE Plan which includes screening and monitoring of all known MS4 outfalls and interconnections in both dry weather (as defined in the Consent Decree) and wet weather (as defined in the Consent Decree) conditions, investigation of all catchment areas, and identification and removal of illicit discharges, consistent with the schedule set forth in this paragraph. The IDDE Plan shall be consistent with EPA Region 1's "EPA New England Bacterial Source Tracking Protocol," January 2012 Draft. The City shall further update the IDDE Plan, as needed, to ensure consistency with any requirements in future NPDES Permits issued to the City. The City shall utilize the screening thresholds listed in the Consent Decree to prioritize all MS4 drainage Catchment areas for IDDE investigations. The IDDE Plan shall include:

a. The current MS4 Catchment area map showing boundaries of each Catchment area and associated outfall or interconnection;

b. Identification of all combined manholes within these Catchment areas;

c. A schedule to inspect the identified combined manholes;

d. A schedule to repair or eliminate the identified combined manholes; and

e. A prioritization of all Catchment areas based on information and data

available, including EPA monitoring results (previously provided to the City), City monitoring results, applicable Total Maximum Daily Loads for impaired waterbodies on the applicable EPA-approved Massachusetts CWA § 303(d) integrated List of Waters, and a schedule for completion of Catchment area investigations.

13. The City shall use the following criteria when conducting dry-weather inspections: under dry-weather conditions (less than 0.1 inches of rain in the preceding 24 hours (but 48 hours when possible) and no significant snowmelt), the City shall inspect all MS4 outfalls and interconnections to other MS4s and sample those with flow. Each outfall and interconnection discharge sample shall be concurrently analyzed for all of the following parameters: E. coli bacteria, surfactants, ammonia, total residual chlorine, temperature, conductivity, and salinity using laboratory analysis or instrumentation defined in Tables 1 and 2 of EPA Region 1's "EPA New England Bacterial Source Tracking Protocol," January 2012 Draft. The City shall maintain detailed and accurate records of the date and time that sampling was conducted and the weather conditions both during, and in the 48 hours prior to, each sampling event.

14. The City shall use these criteria when conducting wet-weather inspections: At least once every three years during wet weather conditions, the City shall inspect and sample all MS4 outfalls and interconnections to other MS4s. For the purposes of sampling outfalls or interconnections, "wet-weather conditions" should consist of at least 0.25-inches of rain over the 24-hour period prior to sampling. To facilitate sample planning and execution, however, precipitation events sufficient to produce any flow in outfalls or interconnections to be sampled will also be acceptable. Each outfall or interconnection discharge samples shall be concurrently analyzed for all of the following parameters: *E. coli* bacteria, surfactants, ammonia, total

residual chlorine, temperature, conductivity, and salinity, using laboratory analysis or instrumentation defined in Tables 1 and 2 of EPA Region 1's "EPA New England Bacterial Source Tracking Protocol," January 2012 Draft. The City shall maintain detailed and accurate records of the date and time that sampling was conducted and the weather conditions both during, and in the 24 hours prior to, each sampling event.

15. Illicit discharge removal and abatement: For purposes of 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. This program shall contain the following for removal of illicit discharges and confirmation of elimination:

a. Upon detection of a Potential Illicit Discharge, the City shall locate, identify and eliminate the illicit discharge as expeditiously as possible. Upon identification of the illicit source, the City shall notify all responsible parties for any such discharge and require immediate cessation of improper disposal practices in accordance with its legal authorities. Where elimination of a direct-plumbed source(s) of an illicit discharge within 60 Days of its identification as the source is not possible, the City shall establish an expeditious schedule, not to exceed one year, for its elimination by the City. If elimination of other identified source(s) (including indirect sources(s)) of an illicit discharge within 60 Days of its identification as the source is not possible, the City shall establish an expeditious schedule, not to exceed three years, for its elimination. Discharges from the MS4 that are mixed with an illicit discharge are not authorized and remain unlawful until eliminated;

b. Within one year following the removal of a verified illicit discharge, the City shall conduct additional dry- and wet-weather monitoring to confirm that the illicit discharge has

been eliminated. If confirmatory screening indicates evidence of a continued Potential Illicit Discharge, the Catchment shall be scheduled for additional investigation and illicit discharge removal. In the event EPA informs the City that illicit discharges have not been eliminated from a particular outfall, based upon City data or EPA data (including EPA's PPCP data), the Catchment shall be scheduled for additional investigation and illicit discharge removal; and

c. Combined Manholes: If it is found that a combined manhole(s) is contributing to contamination within the MS4 the City shall establish an expeditious schedule(s) for its(their) elimination, and report the dates of identification and schedule(s) for removal in the City's Compliance Report. For combined manhole(s) that are overflowing multiple times within one year or are contributing significant contamination to the MS4, the City shall eliminate such combined manhole(s) within one year of such discovery.

16. Upon approval by EPA, the IDDE Plan shall be incorporated into and become enforceable under this Consent Decree and the City shall implement the IDDE Plan, as approved by EPA, in accordance with the schedule set forth therein.

17. The City shall provide information relating to implementation of its IDDE Plan semi-annually in the compliance report required by the Consent Decree.

Best Management Practices (BMPs)

18. The City shall include BMPs as defined in the Consent Decree to eliminate sources of pollutants. If the City's IDDE investigation identifies a source of pollutants to the City's MS4 whose elimination requires implementation of BMPs, the City shall include recommendations for implementing Green Infrastructure ("GI")/Low Impact Development ("LID") BMPs to address the MS4 pollutant discharge. If GI/LID BMPs are not recommended for implementation, the City shall provide a reason why such GI/LID BMP implementation is

not being recommended for each particular location and shall include such explanation in the compliance reports required under the consent decree.

Measures to Minimize Nitrogen in Stormwater

19. The City shall identify and implement BMPs designed to reduce Nitrogen discharges to waterbodies, or their tributaries. To address Nitrogen discharges the City shall comply with the following requirements:

a. The City shall update its September 2019 Stormwater Management Program ("SWMP") by May 31, 2023 to incorporate the requirements of this section and document the date of SWMP update.

b. Additional or Enhanced BMPs:

i. The City shall distribute an annual message in the spring (April/May) timeframe that encourages the proper use and disposal of grass clippings and encourages the proper use of slow-release fertilizers. The City shall distribute an annual message in the summer (June/July) timeframe encouraging the proper management of pet waste, including noting any existing ordinances where appropriate. The City shall distribute an annual message in the fall (August/September/October) timeframe encouraging the proper disposal of leaf litter. The City shall deliver an annual message on each of these topics, unless the City determines that one or more of these issues is not a significant contributor of Nitrogen to discharges from the MS4 and retains documentation of this finding in the SWMP;

ii. Stormwater Management in New Development and Redevelopment: 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; and

iii. Good House Keeping and Pollution Prevention for City Owned Operations: The City shall establish requirements for use of slow-release fertilizers on City owned property currently using fertilizer. The City shall establish procedures to properly manage grass cuttings and leaf litter on City property, including prohibiting blowing organic waste materials onto adjacent impervious surfaces; increased street sweeping frequency of 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 year, once in the spring (following winter activities such as sanding) and at least once in the fall (Sept 1 – Dec 1; following leaf fall).

c. Nitrogen Source Identification Report

i. By December 31, 2023, the City shall complete a Nitrogen Source Identification Report. The report shall include the following elements: (1) Calculation of total urbanized area within the City's jurisdiction that is within the Connecticut River Watershed, incorporating updated mapping of the MS4 and Catchment delineations, (2) All screening and monitoring results targeting the receiving water segment(s), (3) Impervious area and directly connected impervious area (DCIA) for the target Catchment, (4) Identification, delineation and prioritization of potential Catchments with high Nitrogen loading, and (5) Identification of potential retrofit opportunities or opportunities for the installation of structural BMPs during redevelopment.

ii. The Nitrogen source identification report shall be submitted to EPA in the January 31, 2024 Compliance Report.

d. Potential Structural BMPs

i. By December 31, 2023 the City shall evaluate all City-owned

properties or those 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. The evaluation shall include: (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.

ii. The City shall provide a listing of planned structural BMPs and a plan and schedule for implementation in the January 31, 2024 Compliance Report. The City shall 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. The demonstration project shall be installed targeting a Catchment with high Nitrogen load potential. The City shall install the remainder of the structural BMPs in accordance with the plan and schedule provided in the January 31, 2024 Compliance Report.

iii. Any structural BMPs installed by the City shall be tracked and the City shall estimate the Nitrogen removal by the BMP. The City shall document the BMP type, total area treated by the BMP, the design storage volume of the BMP and the estimated Nitrogen removed in mass per year by the BMP in each annual Compliance Report required by the consent decree.

Geographic Information System Maps

20. By December 31, 2022, the City shall update and submit to EPA and MassDEP in electronic format the current version of the City's stormwater collection system and wastewater collection system geographical information system (GIS) map to include the following information:

a. Outfalls and receiving waters;
b. Open channel conveyances;
c. Interconnections with other MS4s and other storm sewer systems;
d. Municipally-owned stormwater treatment structures;
e. Waterbodies identified by name and indication of all use impairments; and
f. Initial Catchment delineations identifying the area that drains to each individual outfall or interconnection.

21. The City shall submit to EPA for review updated maps reflecting newly developed and/or discovered information, corrections, and modifications in conjunction with the compliance reporting required by this Consent Decree. Such mapping shall be designed to provide a comprehensive depiction of key infrastructure and factors influencing the proper operation and maintenance of the City's Collection System and MS4, and each update shall include progress toward achieving that design. Mapping shall include: water resource and topographic features; sanitary and stormwater sewer infrastructure; prior investigation and study findings; cleaning and repair activities; and capital projects. The scale and detail of the maps shall be appropriate to facilitate a clear understanding of the City's Collection System and MS4 by the City, EPA, and MassDEP. In addition, the mapping shall serve as a planning tool for the implementation of future remedial measures, shall delineate the extent of completed and planned investigations and corrections, and shall include other related capital projects. To ensure legible mapping, information shall be grouped appropriately and represented thematically (*e.g.*, by color coding) with legends or schedules where possible. Mapping shall be updated as necessary to reflect newly developed and discovered information, corrections, or modifications. The following information and features shall, at a minimum, be included in the mapping:

a. Base Map
   i. Municipal boundaries;
   ii. Street names;
   iii. Private property delineations;

b. Water Resources and Topographic Features
   i. Water bodies and watercourses identified by name and all use impairments identified in Massachusetts' most recent Integrated List of Waters prepared to fulfill reporting requirements of Section 303(d) of the Clean Water Act;
   ii. Topography;

c. Infrastructure
   i. MS4:
   ii. Outfalls;
   iii. Pipes (including size and material);
   iv. Open channel conveyances (*e.g.*, swales, ditches);
   v. Catch basins;
   vi. Manholes;
   vii. Inter-municipal connections;
   viii. Municipally-owned stormwater treatment structures (e.g., detention and retention basins, infiltration systems, bioretention areas, water quality swales, gross particle separators, oil/water separators, and other proprietary systems);
   ix. Delineation of Catchment areas for each outfall;

d. Collection System:
   i. Pipes (including size, material, and approximate age);
   ii. Flow type (e.g., pressure, vacuum, gravity);
   iii. Manholes;
   iv. Pump stations (public and private), and other key sewer
   v. Appurtenances);
   vi. Locations of interceptor sewers;
   vii. Delineation of Sewershed areas for each connection to the
   viii. interceptor sewer;
      1) Sewersheds or sewer alignments experiencing inadequate level of service (with indication of reason(s));
      2) Common/twin-invert manholes or structures (*i.e.*, structures serving or housing both separate storm and sanitary sewers);
      3) Collection System alignments served by known or suspected underdrain systems;
      4) Sewer alignments with common trench construction and major crossings representing high potential for communication during high groundwater conditions;

e. Investigations, remediation, and capital projects completed for the City's MS4 and Collection System in accordance with this Consent Decree, including:
   i. Alignments, dates, and thematic representation of work completed (with legend) of past investigations (e.g., flow isolation, dye testing, closed-circuit television, etc.);
   ii. Locations of suspected, confirmed, and eliminated illicit discharges (with dates and flow estimates) to the City's MS4;

iii. Alignments and dates of past and planned infrastructure remediation projects;
iv. Planned Collection System and MS4 capital projects; and
v. Proposed phasing of future capital projects.

VII. REPORTS ON COMPLIANCE

22. Until otherwise directed in writing by EPA, the City shall submit by January 31 and July 31 of each year for review by EPA and MassDEP a Compliance Report ("Compliance Report") for the previous six-month period (January 1st through June 30th, and July 1st through December 31st) ("Reporting Period") regarding its progress in implementing the Remedial Measures and other provisions of this Consent Decree. Each Compliance Report shall at a minimum:

a. Describe activities undertaken during the Reporting Period directed at achieving compliance with this Consent Decree;

b. Identify all plans, reports, and other deliverables required by this Consent Decree that have been completed and submitted during the Reporting Period;

c. Describe the expected activities to be taken during the next Reporting Period in order to achieve compliance with this Consent Decree; and,

d. Identify any anticipated or potential areas of noncompliance with this Consent Decree.

Technical Meetings. The technical staff at EPA, the MassDEP, and the City will arrange to meet in person or remotely following the City's submission of the January 31 and July 31reports to review the City's compliance with the terms of the Consent Decree.

Website. The City shall also establish and maintain a public website to provide a means for interested parties to access and view deliverables and modifications to deliverables under the Consent Decree.

The reporting requirements set forth in this Section do not relieve the City of its obligation to submit any other reports or information as required by Federal, Commonwealth or local law or regulation. EPA reserves the right to review and require modifications to the above reporting requirements.

VIII. REVIEW OF DELIVERABLES

23. After review of any plan, schedule, report, or other item that is required to be submitted for approval by EPA and/or MassDEP pursuant to this Consent Decree, EPA and/or MassDEP, as appropriate, shall in writing: (a) approve, in whole or in part, the submission; (b) approve, in whole or in part, the submission upon specified conditions; (c) approve part of the submission and disapprove the remainder; or (d) disapprove the submission.

24. If EPA and/or MassDEP, as appropriate, approves the submission pursuant to Paragraph 23, the City shall take all actions required by the plan, report, or other document, in accordance with the schedules and requirements of the plan, report, or other document, as approved. If EPA and/or MassDEP, as appropriate, provides conditional approval or approval only in part pursuant to the previous Paragraph, the City shall, upon written direction from EPA and/or MassDEP, as appropriate, take all actions required by the approved plan, report, or other item that EPA and/or MassDEP, as appropriate, determines are technically severable from any disapproved portions, subject to the City's right to dispute only the specified conditions or the disapproved portions, under Section XI, below (Dispute Resolution).

25. If EPA and/or MassDEP, as appropriate, disapproves the submission, in whole or in part, pursuant to Paragraph 23, above, the City shall, within 45 Days or such other time as the Parties agree to in writing, correct all deficiencies and resubmit the plan, report, or other item, or disapproved portion thereof, for approval, in accordance with the preceding Paragraphs. If the

resubmission is approved in whole or in part, the City shall proceed in accordance with the preceding Paragraph.

26. If EPA and/or MassDEP, as appropriate, disapproves in whole or in part a resubmitted plan, report, or other item, or portion thereof, EPA and/or MassDEP, as appropriate, may again require the City to correct any deficiencies, in accordance with this Paragraph, or may itself correct any deficiencies subject to the City's right to invoke Dispute Resolution under Section XII and the right of EPA and/or MassDEP, as appropriate, stipulated penalties as provided Section IX. If the City elects to invoke Dispute Resolution as set forth in Section XII herein, the City shall do so by sending a Notice of Dispute in accordance with that Section within 15 Days (or such other time as the Parties agree to in writing) after receipt of the applicable decision.

IX. STIPULATED PENALTIES

27. The City shall pay stipulated penalties to the United States and the Commonwealth for violations or noncompliance with the requirements of this Consent Decree, as set forth below, unless excused under Section XI, below (Force Majeure). A violation or noncompliance includes failing to perform an obligation required by the terms of this Consent Decree, including any work plan or schedule approved under this Decree, according to all applicable requirements of this Consent Decree and within the specified time schedules or by the date(s) established by or approved under this Decree: Reporting and Monitoring Requirements. For every Day that the City fails timely to submit a report required by Section VII (Reports on Compliance) herein, or fails to provide the certification required in Section XIV (Form of Notice) herein, the Defendant shall pay a stipulated penalty as follows:

Penalty Per Violation Per Day	Period of Noncompliance
$ 750	1st through 10th Day
$ 1,500	11th through 20th Day
$ 2,500	21st Day and beyond

28. Remedial Measures. For every Day that the City fails to timely meet the requirements of Section VI (Remedial Measures) of this Consent Decree, including but not limited to, submitting an approvable plan, schedule, report, or other item, other than a report required by Section VII (Reports on Compliance) herein, or fails to implement remedial requirements in a plan, schedule, report, or other item Approved by EPA and/or MassDEP, the Defendant shall pay a stipulated penalty as follows:

Penalty Per Violation Per Day	Period of Noncompliance
$ 1,500	1st through 10th Day
$ 3,000	11th through 20th Day
$ 5,000	21st Day and beyond

29. Transfer of Facility. If the City fails to: (a) provide a copy of this Consent Decree to any proposed transferee; (b) provide written notice to the United States or the Commonwealth at least 30 Days prior to any transfer of any portion of the facility; or (c) provide a copy of the proposed written agreement with the transferee as required by Paragraph 4, the City shall pay a stipulated penalty of $10,000 per occurrence.

30. Obligations Prior to the Effective Date. Upon the Effective Date, the stipulated penalty provisions of this Decree shall be retroactively enforceable with regard to any and all violations that have occurred prior to the Effective Date, provided that stipulated penalties that may have accrued prior to the Effective Date may not be collected unless and until this Consent Decree is entered by the Court.

31. Stipulated penalties shall continue to accrue under this Section during any Dispute Resolution under Section XI herein but need not be paid until the following:

a. If the dispute is resolved by agreement of the Parties or by a decision of EPA and/or MassDEP that is not appealed to the Court, the City shall pay accrued penalties determined to be owing, together with interest, to the United States and Commonwealth within 30 Days of the effective date of the agreement or the receipt of EPA's and/or MassDEP's, as appropriate, decision or order.

b. If the dispute is appealed to the Court and the United States and/or the Commonwealth prevails in whole or in part, the City shall pay all accrued penalties determined by the Court to be owing, together with interest, within 60 Days of receiving the Court's decision or order, except as provided in subparagraph c., below.

c. If the City appeals the District Court's decision, the Defendant shall pay all accrued penalties determined to be owing, together with interest, within 15 Days of receiving the final appellate court decision.

32. If the City fails to pay stipulated penalties according to the terms of this Consent Decree, the City shall be liable for interest on such penalties, as provided for in 28 U.S.C. § 1961 ("Interest"), accruing as of the date payment became due.

33. The payment of penalties and interest, if any, shall not alter in any way the City's obligation to complete the performance of the requirements of this Consent Decree.

34. Accrual of Penalties. Stipulated penalties accrue from the date performance is due, or the day a noncompliance occurs, whichever is applicable, until the date the requirement is completed or the final day of the correction of the noncompliance. Nothing in this Decree prevents the simultaneous accrual of separate penalties for separate violations of this Decree.

Stipulated penalties accrue regardless of whether the City has been notified of its noncompliance, and regardless of whether the City has initiated Dispute Resolution under Section XI, provided, however, that no penalties will accrue as follows:

a. with respect to a submission that EPA and/or MassDEP, as appropriate, subsequently determines is deficient under Section VIII (Review of Deliverables), during the period, if any, beginning on the 31st day after EPA's and/or MassDEP's, as appropriate, receipt of such submission until the date that EPA notifies the City of any deficiency.

b. with respect to a matter that is the subject of Dispute Resolution under Section XII, during the period, if any, beginning on the 21st day after the later of the date that EPA's and/or MassDEP's, as appropriate, Statement of Position is received or the date that the City's reply thereto (if any) is received until the date of the formal decision under Paragraphs 42 and 44.

c. with respect to a matter that is the subject of judicial review by the Court under Paragraphs 45, during the period, if any, beginning on the 31st day after the Court's receipt of the final submission under Paragraph 46, below, regarding the dispute until the date that the Court issues a final decision regarding such dispute.

35. Demand and Payment of Stipulated Penalties. EPA or the Commonwealth or both may send the City a demand for stipulated penalties. Where both sovereigns elect to seek stipulated penalties for any violation of this Consent Decree, any such penalties determined to be owing shall be paid fifty percent (50%) to the United States and fifty percent (50%) to the Commonwealth. Where one sovereign elects to seek such stipulated penalties, and the other sovereign does not join in the demand within 15 Days of its receipt of written notice, timely joins in the demand as to only some of the violations in question, or timely joins in the demand but

subsequently elects to waive stipulated penalties as to any or all of the violations in question, the entire amount of the stipulated penalties determined to be owing for each violation as to which only one sovereign has sought stipulated penalties shall be payable to the sovereign making the demand. Where one sovereign reduces the stipulated penalty otherwise payable for any violation, the difference shall be payable to the other sovereign. In no case shall the determination by one sovereign not to seek stipulated penalties preclude the other sovereign from seeking stipulated penalties, as otherwise provided for by, and consistent with, the terms of this Consent Decree.

36. The demand will include a description of the noncompliance and will specify the amount of the stipulated penalties owed. The City may initiate Dispute Resolution under Section XII within 30 days after receipt of the demand. The City shall pay the amount demanded or, if it initiates dispute resolution, the uncontested portion of the amount demanded, within 30 days after receipt of the demand. The City shall pay the contested portion of the penalties determined to be owed, if any, within 30 days after the resolution of the dispute. Each payment for (a) the uncontested penalty demand or uncontested portion, if late; and (b) the contested portion of the penalty demand determined to be owed, if any, must include an additional amount for Interest accrued from the date of receipt of the demand through the date of payment.

37. Notwithstanding any other provision of this Section, the United States or the Commonwealth, as appropriate, may, in its/their unreviewable discretion, waive any portion of stipulated penalties that have accrued under this Decree.

38. Following the United States' and/or the Commonwealth's determination that the City has failed to comply with a requirement of this Consent Decree, the United States and/or the Commonwealth may give the Defendant written notification of the same and describe the

noncompliance. The United States and/or the Commonwealth may send the Defendant a written demand for the payment of the stipulated penalties. However, the stipulated penalties shall accrue as provided in the preceding Paragraph regardless of whether the United States and/or the Commonwealth has notified the Defendant of a violation of or noncompliance with the requirements of this Consent Decree, or demanded payment of stipulated penalties.

39. The Defendant shall pay stipulated penalties as specified in this Section by delivering the payments to the United States and the Commonwealth, in equal amounts, within 30 Days of the date of a demand for payment of stipulated penalties in accordance with the instructions set forth as follows:

a. One half of the stipulated penalties (unless a different division is required under Paragraph 26 above), as payment to the United States, shall be made, upon written demand, by FedWire Electronic Funds Transfer ("EFT") to the U.S. Department of Justice in accordance with written instructions to be provided to the Defendant by the Financial Litigation Unit of the U.S. Attorney's Office for the District of Massachusetts. The cost of such electronic transfer shall be the responsibility of the City. At the time of payment, the Defendant shall send a copy of the EFT authorization form and EFT transaction record, together with a transmittal letter, which shall state that the payment is for stipulated penalties owed pursuant to the Consent Decree in United States and Commonwealth of Massachusetts v. City of Holyoke, Massachusetts, and shall reference the civil action number and DOJ case number 90-5-1-1-11703, to the United States in accordance with Section XIV (Form of Notice) herein; by email to acctsreceivable.CINWD@epa.gov; and by mail to: EPA Cincinnati Finance Office, 26 Martin Luther King Drive, Cincinnati, Ohio 45268.

b. The City shall also make one-half of any stipulated payment to the Commonwealth by Electronic Funds Transfer ("EFT") to the Commonwealth in accordance with current EFT procedures, using the following account information:

Commonwealth of Massachusetts, Office of Attorney General
ABA#: 011075150
ACCOUNT#: 00088882022
SANTANDER BANK
75 STATE STREET
BOSTON, MA 02109
TIN: 046002284

and shall include the following in the payment information: "EPD, Commonwealth v. City of Holyoke." Any payments received by the Commonwealth after 4:00 P.M. (Eastern Time) will be credited on the next business day. At the time of payment, Holyoke shall send notice, by electronic mail, that such payment has been made to the Commonwealth to I. Andrew Goldberg, Environmental Protection Division at andy.goldberg@mass.gov and shall include all of the payment information stated in this Paragraph in addition to the amount of the payment.

40. In the event the Defendant fails to pay stipulated penalties according to the terms of this Consent Decree, such penalty (or portion thereof) shall be subject to interest at the statutory judgment rate set forth at 28 U.S.C. § 1961, accruing as of the date payment became due.

41. Stipulated penalties are not the United States' or Commonwealth's exclusive remedy for violations of this Consent Decree. Subject to the provisions of Section XV (Effect of Settlement/Reservation of Rights), the United States and Commonwealth expressly reserve the right to seek any other relief it deems appropriate for the City's violation of this Consent Decree or applicable law, including but not limited to an action against the City for statutory penalties, additional injunctive relief, mitigation or offset measures, and/or contempt. The amount of any

statutory penalty assessed for a violation of this Consent Decree shall be reduced by the amount of any stipulated penalty assessed and paid pursuant to this Consent Decree.

X. CIVIL PENALTY

42. Within thirty (30) Days after the Effective Date, the City shall pay a civil penalty of $50,000, together with interest accruing from the Effective Date at the rate specified in 28 U.S.C. § 1961, which shall be divided between the Plaintiffs as follows:

a. $ 25,000, plus applicable interest, to the United States; and

b. $ 25,000, plus applicable interest, to the Commonwealth.

The City shall pay the civil penalty in the manner specified in Paragraph 39, above.

XI. FORCE MAJEURE

43. "Force Majeure," for purposes of this Consent Decree, is defined as any event arising from causes entirely beyond the control of the City or of any entity controlled by the City, including its engineers, consultants, contractors and subcontractors, that delays or prevents the timely performance of any obligation under this Consent Decree notwithstanding the City's best efforts to fulfill the obligation. The requirement that the City exercise "best efforts" includes using best efforts to anticipate any potential Force Majeure event and best efforts to address the effects of any such event (a) as it is occurring and (b) after it has occurred to prevent or minimize any resulting delay to the greatest extent possible. "Force Majeure" does not include the City's financial inability to perform any obligation under this Consent Decree. Stipulated Penalties shall not be due for the number of Days of noncompliance caused by a Force Majeure event as defined in this Section, provided that the City complies with the terms of this Section.

44. If any event occurs which may delay or prevent the performance of any obligation under this Consent Decree, whether or not caused by a Force Majeure event, the City shall notify

EPA and MassDEP within 72 hours after the City first knew or should have known that the event might cause a delay. Within five working Days thereafter, the City shall submit for approval by EPA and MassDEP, at the addresses specified in Section XIV (Form of Notice), a written explanation of the cause(s) of any actual or expected delay or noncompliance, the anticipated duration of any delay, the measure(s) taken and to be taken by the City to prevent or minimize the delay, a proposed schedule for the implementation of such measures, and a statement as to whether, in the opinion of the City, such event may cause or contribute to an endangerment to public health, welfare, or the environment. Notwithstanding the foregoing, the City shall notify EPA and MassDEP orally within 24 hours of becoming aware of any event that presents an imminent threat to the public health or welfare or the environment and provide written notice to EPA and MassDEP within 72 hours of discovery of such event. Such notification does not supplant any other notifications that may be required under applicable law. The City shall be deemed to know of any circumstances of which the City, any entity controlled by the City, or the City's contractors knew or should have known. Failure to provide timely and complete notice in accordance with this Paragraph shall constitute a waiver of any claim of Force Majeure with respect to the event in question.

45. If EPA and MassDEP agree that a delay or anticipated delay is attributable to Force Majeure, the time for performance of the obligations under this Consent Decree that are affected by the Force Majeure event shall be extended by EPA, after a reasonable opportunity for review and comment by MassDEP, for a period of time as may be necessary to allow performance of such obligations. EPA will notify the City in writing of the length of the extension, if any, for performance of the obligations affected by the Force Majeure event.

46. If EPA, after a reasonable opportunity for review and comment by MassDEP, does not agree the delay or anticipated delay is attributable to Force Majeure or on the number of Days of noncompliance caused by such event, EPA will notify the City in writing of its decision. The City may then elect to initiate the dispute resolution process set forth in Section XII (Dispute Resolution). In any dispute resolution proceeding, the City shall have the burden of demonstrating by a preponderance of the evidence that the delay or anticipated delay has been or will be caused by a Force Majeure event, that the duration of the delay or the extension sought was or will be warranted under the circumstances, that "best efforts" were exercised to avoid and mitigate the effects of the delay, and that the City complied with the requirements of this Section. If the City carries this burden, the delay at issue shall be deemed not to be a violation by the City of the affected obligation(s) of this Consent Decree identified to EPA, MassDEP, and the Court.

47. Delay in performance of any obligation under this Consent Decree shall not automatically justify or excuse delay in complying with any subsequent obligation or requirement of this Consent Decree.

48. Failure of the City to obtain any Federal or Commonwealth grants or loans shall not be considered a Force Majeure event under this Consent Decree.

XII. DISPUTE RESOLUTION

49. Unless otherwise expressly provided for in this Consent Decree, the dispute resolution procedures set forth in this Section shall be the exclusive mechanism to resolve disputes arising under, or with respect to, this Consent Decree. The City's failure to seek resolution of a dispute under this Section shall preclude the City from raising any such undisputed issue as a defense to an action by the United States or the Commonwealth to enforce any obligation of the City arising under this Consent Decree.

50. Informal Dispute Resolution. Any dispute subject to Dispute Resolution under this Consent Decree shall first be the subject of informal negotiations. The dispute shall be considered to have arisen when the City sends DOJ, EPA, and the Commonwealth a written Notice of Dispute. Such Notice of Dispute shall state clearly the matter in dispute. The period of informal negotiations shall not exceed 20 Days from the date the dispute arises, unless that period is modified by written agreement of the Parties. If the Parties cannot resolve a dispute by informal negotiations, then the position advanced by the United States and/or the Commonwealth, as appropriate, shall be considered binding unless, within 10 Days after the conclusion of the informal negotiation period, the City invokes formal dispute resolution.

51. Formal Dispute Resolution. The City shall invoke formal dispute resolution procedures, within the time period provided in the preceding Paragraph, by sending DOJ, EPA, and the Commonwealth a written Statement of Position regarding the matter in dispute. The Statement of Position shall include, but need not be limited to, any factual data, analysis, or opinion supporting the City's position and any supporting documentation relied upon by the City.

52. The United States and/or the Commonwealth will send the City its Statement of Position within 45 Days of receipt of the City's Statement of Position. The United States' and/or the Commonwealth's, as appropriate, Statement(s) of Position shall include, but need not be limited to, any factual data, analysis, or opinion supporting that position and any supporting documentation relied upon by the United States. The Director of the Enforcement and Compliance Assurance Division, EPA Region 1, will issue a final decision resolving the matter in dispute. The decision of the Director of the Enforcement and Compliance Assurance Division, EPA Region 1, shall be binding on the City, subject only to the right to seek judicial

review, in accordance with the following Paragraph. EPA shall maintain an administrative record of the dispute, which shall contain all statements of the Parties, including supporting documentation, submitted pursuant to this Section, and the decision of the Director of the Enforcement and Compliance Assurance Division, EPA Region 1. The United States' and/or the Commonwealth's Statement(s) of Position is binding on the City, unless the City files a motion for judicial review of the dispute in accordance with the following Paragraph.

53. Judicial Dispute Resolution. The City may seek judicial review of the dispute by filing with the Court and serving on the United States and/or the Commonwealth, as appropriate, a motion requesting judicial resolution of the dispute. The motion must be filed within 10 Days of receipt of the United States' and/or the Commonwealth's Statement(s) of Position pursuant to the preceding Paragraph. The motion shall contain a written statement of Defendant's position on the matter in dispute, including any supporting factual data, analysis, opinion, or documentation, and shall set forth the relief requested and any schedule within which the dispute must be resolved for orderly implementation of the Consent Decree.

54. The United States and/or the Commonwealth, as appropriate, shall respond to the City's motion within the time period allowed by the Local Rules of this Court. The City may file a reply memorandum, to the extent permitted by the Local Rules.

55. Standard of Review: Disputes Concerning Matters Accorded Record Review. Except as otherwise provided in this Consent Decree, in any dispute brought under this Section regarding the adequacy or appropriateness of plans, procedures to implement plans, schedules or any other items requiring approval by EPA under this Consent Decree, regarding the adequacy of the performance of work undertaken pursuant to this Consent Decree, or that is accorded review on the administrative record under applicable principles of administrative law, the City shall

have the burden of demonstrating, based on the administrative record, that the position of the United States and/or the Commonwealth, as appropriate, is arbitrary and capricious or otherwise not in accordance with law.

56. Standard of Review: Other Disputes. Except as otherwise provided in this Consent Decree, in any other dispute brought under Paragraph 51 (Formal Dispute Resolution), the City shall bear the burden of demonstrating that its position complies with this Consent Decree and better furthers the objectives of the Consent Decree set forth in Section V (Objectives).

57. The invocation of dispute resolution procedures under this Section shall not, by itself, extend, postpone, or affect in any way any obligation of the City under this Consent Decree, unless and until final resolution of the dispute so provides.

XIII. RIGHT OF ENTRY/INFORMATION COLLECTION AND RETENTION

58. EPA and MassDEP and their contractors, consultants, and attorneys shall have authority to enter any property and/or facility owned and/or controlled by the City, at all reasonable times, upon proper identification, for the purposes of: (a) monitoring the progress of activity required by this Consent Decree; (b) verifying any data or information submitted to EPA and MassDEP under this Consent Decree; (c) assessing the City's compliance with this Consent Decree; (d) obtaining samples and, upon request, splits of any samples taken by the City or its representatives, contractors, or consultants; and (e) obtaining documentary evidence, including photographs and similar data. Upon request, EPA and MassDEP shall provide the City splits of any samples taken by EPA or MassDEP. This requirement is in addition to, and does not limit, the authority of EPA or MassDEP pursuant to the CWA, the Massachusetts Act, or any other provision of Federal or Commonwealth law or regulation.

59. Until five years after the termination of this Consent Decree, the City shall retain non-identical copies of all documents, records, or other information (including documents, records, or other information in electronic form) generated by the City, and all data collected and all reports generated by the City's contractors (including data and reports in electronic form), that relate in any manner to the City's performance of its obligations under this Consent Decree. This information retention requirement shall apply regardless of any contrary corporate or institutional policies or procedures. At any time during this information-retention period, upon request by the United States or the Commonwealth, the City shall provide copies of any documents, records, or other information required to be maintained under this Paragraph.

60. At the conclusion of the information-retention period provided in the preceding Paragraph, the City shall notify the United States and the Commonwealth at least 90 Days prior to the destruction of any documents, records, or other information subject to the requirements of the preceding Paragraph and, upon request by the United States or the Commonwealth, the City shall deliver any such documents, records, or other information to EPA and/or MassDEP. The City may assert that certain documents, records, or other information are privileged under the attorney-client privilege or any other privilege recognized by Federal law. If the City asserts such a privilege, it shall provide the following: (1) the title of the document, record, or information; (2) the date of the document, record, or information; (3) the name and title of each author of the document, record, or information; (4) the name and title of each addressee and recipient; (5) a description of the subject of the document, record, or information; and (6) the privilege asserted by the City. However, no documents, records, data, reports or other information created or generated pursuant to the requirements of this Consent Decree shall be withheld on grounds of privilege.

61. This Consent Decree in no way limits or affects any right of entry and inspection, or any right to obtain information, held by the United States or the Commonwealth pursuant to applicable Federal or Commonwealth laws, regulations, or permits, nor does it limit or affect any duty or obligation of the City to maintain documents, records, or other information imposed by applicable Federal or Commonwealth laws, regulations, or permits.

XIV. FORM OF NOTICE

62. All agreements, approvals, consents, deliverables, modifications, notices, notifications, objections, proposals, reports, waivers, and requests specified in this Decree must be in writing unless otherwise specified. Whenever a notice is required to be given or a report or other document is required to be sent by one Party to another under this Decree, it must be sent as specified below. All notices under this Section are effective upon receipt, unless otherwise specified. In the case of emailed notices, there is a rebuttable presumption that such notices are received on the same day that they are sent. Any Party may change the method, person, or address applicable to it by providing notice of such change to all Parties.

As to DOJ:	<u>As to the U.S. Department of Justice</u> Chief, Environmental Enforcement Section Environment & Natural Resources Division United States Department of Justice P.O. Box 7611 - Ben Franklin Station Washington, DC 20044 Re: DJ# 90-5-1-1-11703
As to EPA:	*via email to*: Tonia Bandrowicz, Sr. Enf. Counsel bandrowicz.toni@epa.gov Douglas Koopman, Environmental Engineer koopman.doug@epa.gov

As to Massachusetts Attorney General's Office:	*via email to*: Assistant Attorney General I. Andrew Goldberg Environmental Protection Division andy.goldberg@mass.gov
As to MassDEP:	*via email to*: Christine Y. LeBel, Chief Regional Counsel Christine.LeBel@mass.gov Saadi Motamedi, Acting Deputy Regional Director, Bureau of Water Resources Saadi.Motamedi@mass.gov
As to City of Holyoke:	Lisa A. Ball, City Solicitor Holyoke City Hall Annex Holyoke, MA 01040 balll@holyoke.org

63. The City shall make an electronic copy of all submissions required to be submitted by this Consent Decree, including Compliance Reports, available on a publicly accessible website.

64. All written notices, reports or any other submissions required of the City by this Consent Decree shall contain the following certification by a duly authorized representative of the City:

> 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.

XV. EFFECT OF SETTLEMENT/RESERVATION OF RIGHTS

65. This Consent Decree resolves the civil claims of the United States and the Commonwealth for the violations alleged in the Complaints filed in this action, as well as violations of the City's Small MS4 General Permit that are specifically addressed in this Consent Decree, through the date of lodging.

66. The United States and the Commonwealth reserve all legal and equitable rights and remedies, available to enforce the provisions of this Consent Decree. This Consent Decree shall not be construed to limit the rights of the United States or the Commonwealth to obtain penalties or injunctive relief under the CWA or implementing regulations, the Massachusetts Act, or other Federal or Commonwealth laws, regulations or permit conditions except as expressly specified in Paragraph 65, above. The United States and the Commonwealth further reserve all legal and equitable remedies to address any imminent and substantial endangerment to the public health and welfare or the environment arising at, or posed by, the City's WWTP, whether related to the violations addressed in this Consent Decree or otherwise.

67. This Consent Decree is not a permit, or a modification of any existing permit, under any Federal, Commonwealth, or local laws or regulations. The City is responsible for achieving and maintaining complete compliance with all applicable Federal, Commonwealth, and local laws and regulations, and permits; and the City's compliance with this Consent Decree shall be no defense to any action commenced pursuant to any such laws, regulations, or permits, except expressly specified in Paragraph 65, above. The United States and the Commonwealth do not, by their consent to the entry of this Consent Decree, warrant or aver in any manner that the City's compliance with any aspect of this Consent Decree will result in compliance with provisions of the CWA or with any other provisions of Federal, Commonwealth, or local laws,

regulations or permits. This Consent Decree shall not be construed to constitute EPA and/or MassDEP approval of any equipment or technology installed by the City under the terms of this Consent Decree.

68. In any subsequent administrative or judicial proceeding initiated by the United States or the Commonwealth for injunctive relief, civil penalties, or other appropriate relief relating to the City's WWTP, or the City's violations of Federal, Commonwealth or local laws, and regulations and permits, including the violations alleged in the Complaints, the City shall not assert, and may not maintain, any defense or claim based upon the principles of waiver, res judicata, collateral estoppel, issue preclusion, claim preclusion, claim-splitting, or other defenses based upon any contention that the claims raised by the United States or the Commonwealth in the subsequent proceeding were or should have been brought in the instant case, nor with respect to the Complaints, any defense or claim based upon the expiration of the statute of limitations, except with respect to claims that have been specifically resolved pursuant to Paragraph 65, above.

69. This Consent Decree does not limit any rights or remedies available to the United States or the Commonwealth for any criminal violations.

70. This Consent Decree does not resolve any claims for contingent liability under Section 309(e) of the Clean Water Act, 33 U.S.C. § 1319(e). The United States specifically reserves any such claims against the Commonwealth.

71. This Consent Decree does not limit or affect the rights of the City or the United States against any third parties, not party to this Consent Decree, nor does it limit the rights of third parties, not party to this Consent Decree, against the City, except as otherwise provided by law.

72. This Consent Decree shall not be construed to create rights in, or grant any cause of action to, any third party not party to this Consent Decree.

XVI. COSTS

73. The Parties shall bear their own costs of this action, including attorneys' fees, except that the United States and Commonwealth shall be entitled to collect the costs (including attorneys' fees) incurred in any action necessary to collect any portion of the civil penalty or any stipulated penalties due but not paid by Defendant.

XVII. EFFECTIVE DATE

74. The Effective Date of this Consent Decree shall be the date upon which this Consent Decree is entered by the Court or a motion to enter the Consent Decree is granted, whichever occurs first as recorded on the Court's docket; provided, however, that the City agrees that it shall be bound to perform duties scheduled to occur prior to the Effective Date. In the event the United States withdraws or withholds consent to this Consent Decree before entry, or the Court declines to enter the Consent Decree, then the preceding requirement to perform duties scheduled to occur before the Effective Date shall terminate.

XVIII. RETENTION OF JURISDICTION

75. The Court shall retain jurisdiction over this case until termination of this Consent Decree, for the purpose of resolving disputes arising under this Decree or entering orders modifying this Decree, pursuant to Sections XII or XIX, respectively, or effectuating or enforcing compliance with the terms of this Decree.

XIX. MODIFICATION

76. The terms of this Consent Decree, and any submitted and approved deliverables, may be modified only by a subsequent written agreement signed by all the Parties, except that,

without otherwise altering the obligations of the Consent Decree, (a) the Parties may by written agreement modify the schedules specified in this Decree, and (b) EPA and/or MassDEP may approve submissions upon specified conditions or modify submissions. Where the modification constitutes a material change to this Decree, such as an extension of the final construction date, it shall be effective only upon approval by the Court.

77. Any disputes concerning modification of this Consent Decree shall be resolved pursuant to Section XII (Dispute Resolution), provided, however, that, instead of the burden of proof provided in Section XII, the Party seeking the modification bears the burden of demonstrating that it is entitled to the requested modification in accordance with Federal Rule of Civil Procedure 60(b).

XX. FUNDING

78. Performance of the terms of this Consent Decree by the City is not conditioned on the receipt of any Federal or Commonwealth grant funds or loans. In addition, performance is not excused by the lack of Federal or Commonwealth grant funds or loans.

XXI. SEVERABILITY

79. The provisions of this Consent Decree shall be severable, and should any provision be declared by a court of competent jurisdiction to be unenforceable, the remaining provisions shall remain in full force and effect.

XXII. TERMINATION

80. After the City completes all of the requirements of Section VI (Remedial Measures) and Section VII (Reports on Compliance), above, complies with all other requirements of the Consent Decree, and has paid the civil penalty and any accrued stipulated penalties as required by this Consent Decree, the City may serve upon the United States and the

Commonwealth a Request for Termination, certifying that the City has satisfied those requirements, together with all applicable supporting documentation.

81. Following receipt by the United States and the Commonwealth of the City's Request for Termination, the Parties shall confer informally concerning the Request for Termination and any disagreement that the Parties may have as to whether the City has satisfied the requirements for termination of this Consent Decree. If the United States, after consultation with the Commonwealth, agrees that this Consent Decree may be terminated, the Parties shall submit, for the Court's approval, a joint stipulation terminating the Consent Decree.

82. If the United States and/or the Commonwealth do/does not agree that the Consent Decree may be terminated, the City may invoke dispute resolution under Section XII (Dispute Resolution), above. However, the City shall not seek dispute resolution of any dispute regarding termination until Sixty (60) Days after service of its Request for Termination.

XXIII. SIGNATORIES / SERVICE

83. Each undersigned representative of the City, Commonwealth of Massachusetts, EPA, and the Assistant Attorney General for the Environment and Natural Resources Division of the Department of Justice identified on the DOJ signature page below, certifies that he or she is fully authorized to enter into the terms and conditions of this Consent Decree and to execute and legally bind the Party he or she represents to this document.

84. This Consent Decree may be signed in counterparts, and its validity shall not be challenged on that basis. The City agrees to accept service of process by mail with respect to all matters arising under or relating to this Consent Decree and to waive the formal service requirements set forth in Rules 4 and 5 of the Federal Rules of Civil Procedure and any applicable Local Rules of this Court including, but not limited to, service of a summons. The

City need not file an answer to the U.S. Complaint nor the Commonwealth's Plaintiff-Intervenor Complaint in this action unless or until the Court expressly declines to enter this Consent Decree.

XXIV. PUBLIC PARTICIPATION

85. This Consent Decree shall be lodged with the Court for a period of not less than 30 Days for public notice and comment in accordance with 28 C.F.R. § 50.7. The United States reserves the right to withdraw or withhold its consent if the comments received disclose facts or considerations which indicate that this Consent Decree is inappropriate, improper or inadequate, and the Commonwealth reserves the right to withdraw or withhold consent if the United States withdraws or withholds consent and/or if the comments received disclose facts or considerations which indicate that this Consent Decree is inconsistent with state law. The City consents to the entry of this Consent Decree without further notice and agrees not to withdraw from or oppose entry of this Consent Decree by the Court or to challenge any provision of this Decree, unless the United States has notified the City in writing that it no longer supports entry of this Decree.

XXV. INTEGRATION

86. This Consent Decree, including deliverables that are subsequently approved pursuant to this Decree, constitutes the entire agreement among the Parties regarding the subject matter of the Decree, and supersedes all prior representations, agreements, and understandings, whether oral or written, concerning the subject matter of the Decree herein. Other than submissions that are subsequently submitted and approved pursuant to this Decree, no other document, nor any representation, inducement, agreement, understanding, or promise, constitutes any part of this Decree or the settlement it represents, nor shall it be used in construing the terms of this Decree.

XXVI. SIGNATORIES

87. Each undersigned representative certifies that he or she is fully authorized to enter into the terms and conditions of this Consent Decree and to execute and legally bind the Party he or she represents to this document.

XXVII. APPENDICES

88. The following appendices are attached to and part of this Consent Decree: "Appendix A" is the "Executive Summary" of the City's Updated CSO LTCP submitted to EPA and MassDEP on December 30, 2019; and "Appendix B" is the City's modifications to the December 30, 2019, Updated CSO LTCP as set forth in the City's April 4, 2022, email to EPA and the MassDEP.

XXVIII. FINAL JUDGMENT

89. Upon approval and entry of the Consent Decree by the Court, this Consent Decree shall constitute a final judgment of the Court as to the United States, the Commonwealth of Massachusetts, and Defendant.

Judgment is hereby entered in accordance with the foregoing Consent Decree this _____ day of _____, 2023.

_____

UNITED STATES DISTRICT JUDGE
District of Massachusetts

THE UNDERSIGNED PARTY enters into this Consent Decree in the matter of *United States of America and Commonwealth of Massachusetts v. City of Holyoke, Massachusetts*.

FOR THE UNITED STATES OF AMERICA:

Respectfully submitted,

TODD KIM
Assistant Attorney General
U.S. Department of Justice
Environment and Natural Resources Division

HENRY FRIEDMAN Digitally signed by HENRY FRIEDMAN Date: 2023.03.08 10:48:50 -05'00'

HENRY FRIEDMAN,
Assistant Section Chief
Environmental Enforcement Section
Environment and Natural Resources Division
U.S. Department of Justice
P.O. Box 7611, Ben Franklin Station
Washington, D.C. 20044-7611
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Date

RACHAEL S. ROLLINS
United States Attorney
District of Massachusetts

BRIAN LAMACCHIA Digitally signed by BRIAN LAMACCHIA Date: 2023.03.08 10:02:22 -05'00'

BRIAN M. LaMACCHIA
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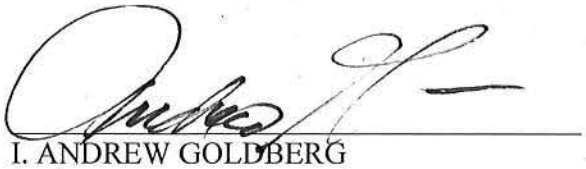
Date

THE UNDERSIGNED PARTY enters into this Consent Decree in the matter of *United States of America and Commonwealth of Massachusetts v. City of Holyoke, Massachusetts*.

FOR THE COMMONWEALTH OF MASSACHUSETTS:

ANDREA JOY CAMPBELL
Attorney General



2/7/2023
Date

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Assistant Attorney General
Environmental Protection Division
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Boston, MA 02108
(617) 727-2200
andy.goldberg@mass.gov

THE UNDERSIGNED PARTY enters into this Consent Decree in the matter of *United States of America and Commonwealth of Massachusetts v. City of Holyoke, Massachusetts*.

For the UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

CARL DIERKER Digitally signed by CARL DIERKER Date: 2023.02.23 10:54:53 -05'00'

CARL DIERKER
Regional Counsel
U.S. Environmental Protection Agency, Region 1
5 Post Office Square, Suite 100
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Date

Of Counsel

TONIA BANDROWICZ
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BENJAMIN BAHK Digitally signed by BENJAMIN BAHK Date: 2023.03.07 13:52:53 -05'00'

BENJAMIN BAHK
Director, Water Enforcement Division
Office of Civil Enforcement
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1200 Pennsylvania Avenue, NW
Washington, DC 20460

Date

LOURDES BUFILL Digitally signed by LOURDES BUFILL Date: 2023.02.23 13:26:18 -05'00'

LOURDES BUFILL
Attorney, Water Enforcement Division
Office of Civil Enforcement
Office of Enforcement and Compliance Assurance
United States Environmental Protection Agency
1200 Pennsylvania Avenue, NW
Washington, DC 20460

Date

United States and Massachusetts v. City of Holyoke Consent Decree

THE UNDERSIGNED PARTY enters into this Consent Decree in the matter of *United States of America and Commonwealth of Massachusetts v. City of Holyoke, Massachusetts*.

For Defendant CITY OF HOLYOKE, MA

Mayor Joshua A. Garcia

Date 2/3/2023

APPENDIX A

Tighe&Bond
Engineers | Environmental Specialists

171471-003
December 30, 2019

Mr. Michael McManus, General Superintendent
Holyoke Department of Public Works
63 Canal Street
Holyoke, MA 01040

Re: Draft CSO Long-Term Control Plan Update Report

Dear Mr. McManus:

Tighe & Bond is pleased to submit to the City of Holyoke the draft Combined Sewer Overflow Long-Term Control Plan (CSO LTCP) Update, which was prepared in accordance with the March 2018 CSO LTCP Update Work Plan that was approved by the Massachusetts Department of Environmental Protection (MassDEP) and the U.S. Environmental Protection Agency (EPA). This evaluation was also conducted in accordance with our October 11, 2018 agreement and November 26, 2019 amendment with the City for this effort.

Executive Summary

This report includes the following tasks:

- Sewer system characterization
- Review of changes to water quality standards and CSO policies
- Review of recent wastewater treatment facility and Berkshire Street CSO Treatment Facility flow and operating data
- Review of CSO activity data
- Review of Connecticut River water quality and quantity data
- Update the hydraulic model of the combined sewer system
- Develop and compare CSO abatement alternatives
- Provide CSO abatement recommendations
- Perform a climate vulnerability assessment
- Perform a financial capability assessment
- Develop an implementation schedule based on the results of the financial capability assessment

Phase 2 tasks, which have not yet been performed, include:

- Implementing a Public Participation Program
- Preparing a final report that includes a description of the public participation program and input received from attendees

1 Sewer System Characterization

The City of Holyoke's wastewater collection system consists of approximately 137 miles of sewer mains, approximately 61% of which is combined. These sewers range from brick, concrete and vitrified clay (VC) pipes in the older portions of the sewer system to reinforced concrete (RC), asbestos cement (AC) and polyvinyl chloride (PVC) pipes in the newer sections of the sewer system. Portions of the system are over 100 years old. The system includes

several major interceptor sewers that receive flow from area collector sewers and convey that wastewater flow towards the City's wastewater treatment facility (WWTF). The interceptor sewers and other key sewers reviewed in greater detail as part of this evaluation include:

- The North Interceptor
- The South Interceptor
- The Front Street Interceptor
- The Highland Park Interceptor
- The Day Brook Sewer
- The Jefferson Street Sewer

These sewer mains were included in the hydraulic model because they are the main lines conveying combined flow from upstream regulators to the WWTF. Refer to the sewer system schematic in Figure EX-1 for the locations of these sewers.

A total of 12 active CSO outfalls still remain in the City and are controlled by 17 regulators. A summary of these CSOs and regulators is presented below in Table EX-1. These CSOs are also shown in the schematic in Figure EX-1.

TABLE EX-1
CSOs Summary

CSO No.	Regulator No.	Location	Receiving Water
2	2	Providence Hospital	Connecticut River
7	7	Northampton St./Glen St. intersection	Connecticut River
8	8	Springdale Park	Connecticut River
9	9[1]	Berkshire St.	Connecticut River
11	11	Jackson St.	Connecticut River
16	16	Front St./Appleton St. intersection	First Level Canal
17	17	Front St./Lyman St. intersection	First Level Canal
18	18	Walnut St.	Connecticut River
18	18A	Essex St./Walnut St. intersection	Connecticut River
18	18B	Highland Park Pump Station	Connecticut River
19	19	Yale St.	Connecticut River
20	20	Cleveland St.	Connecticut River
21	21[2]	River Terrace	Connecticut River
21	21B[2]	River Terrace	Connecticut River
23	23A	Jefferson St., between Madison Ave. and Dartmouth St.	Connecticut River[3]
23	23B	Jefferson St. at Dartmouth St.	Connecticut River[3]
23	23C	Dartmouth St., just east of Jefferson St.	Connecticut River[3]

[1]Overflows from this regulator are currently treated at the Berkshire St. CSO Treatment Facility.
[2]There are 2 overflow points within the one regulator.
[3]During an overflow event, a portion of the discharge may infiltrate into the ground before reaching the river.

The major changes within the wastewater collection system that have occurred since the May 2000 Draft CSO LTCP was completed include:

1. Sewer separation projects in the Jones Ferry Road, Appleton Street, and Mosher Street areas (tributary to CSOs 3, 13 and 14, respectively).
2. The removal of Green Brook from the sewer system (tributary to CSO 21).
3. Regulator modifications at CSOs 2, 7, 8, 9, 11, 13, 16, 18A, 19, 20 and 23.
4. The Berkshire Street CSO Treatment Facility was constructed to treat combined overflows from the CSO 9 Regulator.

These changes have resulted in an estimated 66% reduction in annual combined sewer overflow volume since the draft CSO LTCP was prepared.

There are seven wastewater pumping stations in the City: Jones Ferry Road, Smith's Ferry, Mosher Street, Jackson Street, Cabot Street, Highland Park and Springdale Park. These pump stations are shown on Figure EX-1.

The design of sewer separation in the Jackson Street Area, which is tributary to CSO 11, is complete, and construction is expected to begin in the Spring of 2020.

A map of the City of Holyoke's wastewater collection system is included in Appendix A. The map illustrates key features of the sewer system and shows the sewersheds upstream of each active CSO.

2 CSO Activity and Wastewater Flow Data

The City has a comprehensive CSO monitoring program in place to monitor CSO activity and to ensure that the CSO regulators are operating properly that includes block testing and flow monitoring. This program is implemented by Suez, who has a contract with the City to operate and maintain the City's wastewater collection and storm drainage systems, pump stations, WWTF, and flood control systems. This program is in accordance with EPA and MassDEP permits and regulations.

2.1 CSO Activity and Flows

General observations are as follows:

1. The greatest number of CSO activations occur at the CSO 18 (Walnut Street) and CSO 20 (Cleveland Street) Regulators. Suez has reported that the high number of overflows at CSO 20 are related to 1.) an undersized outlet pipe on Oxford Road (a 16-inch diameter sewer with a flat-slope) and 2.) high flows from the Smith's Ferry Pump Station, which discharges into the gravity system a short distance upstream of the CSO 20 Regulator.
2. The greatest quantity of annual untreated CSO volume discharged to the Connecticut River or the First Level Canal is from CSOs 8 (Springdale Park), 9 (Berkshire Street), 18 (Walnut Street) and 21 (River Terrace), with annual overflow volumes ranging from 28.1 to 41.0 million gallons (MG).
3. The smallest quantity of annual untreated CSO volume discharged to the Connecticut River or the First Level Canal is from CSOs 2 (Providence Hospital), 7 (Northampton Street/Glen Street), 19 (Yale Street) and 23 (Jefferson Street), with annual overflow volumes ranging from 0.1 to 0.6 MG.

2.2 WWTF Flow Data

Average and maximum daily wastewater flow data measured at the WWTF from 2011 to 2018 was also reviewed as part of this evaluation. The data illustrates that the annual average flows, which ranged from 6.8 to 9.5 MGD, were well below the average daily design flow of the WWTF of 17.5 MGD. The average daily flow entering the WWTF exceeded the average daily design flow of 17.5 MGD an average of 5 times annually over the period from 2011 to 2018. The maximum flow through the WWTF exceeded the peak design flow of 37 MGD an average of 30 times annually over the period from 2011 to 2018.

2.3 Berkshire Street CSO Treatment Facility Flow Data

The Berkshire Street CSO Treatment Facility was constructed downstream of the CSO 9 outfall, which conveys the greatest volume of combined sewage/stormwater flow to the Connecticut River annually of the City's CSOs. The CSO Treatment Facility consists of a pump station, screening equipment, and a chlorine contact chamber.

The treatment facility was originally designed so that wastewater flow exceeding the capacity of the influent pumps (103 MGD) would overtop a weir wall in the wetwell, drop into the Return Channel adjacent to the wetwell, and then flow by gravity to the CSO 9 outfall pipe, which conveys the wastewater flow to the Connecticut River. However, shortly after facility startup, it was determined that if the flow level reached the overflow level in the pump station wetwell, basement backups would occur at buildings in the vicinity of the WWTF, and sewage would surcharge in the system to the point that the combined flow would exit the system through manholes on Main Street. In order to address the hydraulic issue described above, a 10-foot wide by 10-foot high opening was cut in the weir wall and was sealed by a new slide gate (Gate 4). Suez has established gate operating parameters to minimize bypasses as described below:

1. Gate 4 is opened when either the flow rate to the CSO Treatment Facility is 165 MGD for 150 seconds or the wastewater level in the pump station wet well is at or above 59.5 feet for 180 seconds.
2. Gate 4 is closed when the flow rate drops to 120 MGD.

CSO treatment facility operating data collected from 2009 to 2018 was reviewed as part of this evaluation. An average of 206 million gallons (MG) of combined flow was directed to the Berkshire Street CSO Treatment Facility annually over the last 10 years. Of that amount, an average of 174 MG (84%) was treated annually either through the CSO treatment facility or returned to the WWTF for secondary treatment. The remaining 32 MG of combined flow (16%) bypassed the CSO treatment facility annually and was discharged to the Connecticut River without treatment. The CSO treatment facility was active an average of 42 days/year from 2009 to 2018. On 9 of these days/year, on average, combined flow was discharged to the Connecticut River without treatment.

3 Watershed and Receiving Water Characterization

Information on the characteristics of the Connecticut River and its watershed was provided in the CSO LTCP Update report. The Connecticut River, which is approximately 410 miles long, is the longest river in New England. The Connecticut River flows from the Connecticut Lakes in northern New Hampshire, along the Vermont/New Hampshire boundary, and then through Massachusetts and Connecticut, eventually discharging into the Long Island Sound at Old Saybrook.

The Connecticut River Watershed, which is the largest river ecosystem in New England, includes a land area of approximately 11,000 square miles over four New England states (Vermont, New Hampshire, Massachusetts and Connecticut). The Nature Conservancy

named the Connecticut River Watershed one of the "Last Great Places" in 1993. The watershed of the mainstem of the Connecticut River within Massachusetts encompasses 660 square miles and includes all or part of 44 communities, including the City of Holyoke.

The portion of the river along Holyoke is approximately 11 miles long and can be divided into two sections: the portion upstream (north) of the Holyoke Dam, which is approximately 6 miles long and the portion downstream (south) of the Holyoke Dam, which is approximately 5 miles long. Within Holyoke, the watershed north of the Holyoke Dam is generally characterized by rural development, while the watershed south of the dam is more urbanized. There are dikes and floodwalls that restrict access along the southern section of the river and prevent flood damage during high river level periods.

In recognition of the Connecticut River's significance to the region, several programs and projects have focused on the protection and restoration of the Connecticut River and revitalization of the communities along the river. For example, the entire Connecticut River watershed was designated as a national fish and wildlife refuge in 1991. The Silvio O. Conte National Fish and Wildlife Refuge Act was passed to conserve, protect and enhance the plant, fish and wildlife species within the watershed. In addition, the Connecticut River was designated by the Federal Government in 1998 as one of fourteen "American Heritage Rivers" in the country. Federal support for the protection and restoration of the Connecticut River and revitalization of the communities along it was provided through this program.

Recreational activities in and along the Connecticut River include primary contact recreation (swimming and water skiing), secondary contact recreation (fishing and boating), and hiking/walking. Most of these recreational activities, however, occur upstream of the Holyoke Dam.

Sensitive areas along the river identified during the study include:

1. Near the Holyoke Dam, because the dam acts as a staging area and temporary bottleneck for uprunning fish. CSO 18 is just upstream of the dam.
2. Although there are no designated public swimming areas along the Connecticut River, swimming is common above the dam at Long Pond Cove and at "High Rock". High Rock is located just downstream of CSO 21 and Long Pond Cove is located downstream of CSO 19.
3. Boating is common in the vicinity of the Sue Panitch River Access Center, an existing public boat launch site at the end of Jones Ferry Road. CSO 2 is just downstream of the boat launch location.

Recent river water quality data confirms that bacteria levels exceed water quality standards.

The Connecticut River is impacted by CSO discharges from the City of Holyoke and other nearby communities along the river, including the Cities of Springfield and Chicopee. Average annual CSO discharges from the three communities are as follows:

Community	Annual CSO Volume (MG)
Holyoke	163[1]
Chicopee	110[2]
Springfield	443[3]

[1]This is the estimated current annual CSO volume. CSO 11 will be eliminated as part of a sewer separation project that has been designed and will soon be bid, which will reduce the total average annual overflow volume by 18 MG to 145 MG.

[2]As reported in Chicopee's 2017 Integrated Management Plan.

[3]As reported in Springfield's 2014 Integrated Wastewater Plan.

In addition to the CSO discharges to the Connecticut River, there are stormwater discharges to the river from Holyoke and many other communities along the river that impact water quality. In the early 2000's, Holyoke, Springfield, and Chicopee partnered with MassDEP and the Pioneer Valley Planning Commission (PVPC) to update a Connecticut River water quality model. The development of the model and an analysis of results is provided in Springfield's Final Long Term CSO Control Plan, dated May 2012. Springfield concluded in their Plan that while CSOs contributed to *E. coli* in the river, the overall volume of stormwater into the river is so much greater than CSO volume that the majority of *E. coli* in the river during rain events can be attributed to stormwater, rather than CSOs.

The PVPC, in collaboration with the Connecticut River Conservancy (CRC), has compiled bacteriological (*E. coli*) data collected from 2012 to the present at multiple locations along the river from Vermont to Connecticut. The data shows that water quality standard exceedances for bacteria were measured in the river within each of the communities where samples were taken, regardless of whether the community has a separate sewer system or a combined sewer system with discharges to the river. In addition, there does not appear to be a significant difference in the number of water quality exceedances upstream of the Holyoke Dam vs. downstream of the Dam. This data may also be indicating that stormwater discharges have a significant impact on water quality within the Connecticut River.

4 Wastewater Collection System Modeling

A hydrologic and hydraulic model of the Holyoke wastewater collection system was developed as part of the draft CSO LTCP. The model simulated CSO activity in the City during storm events of various sizes and was used to develop and evaluate CSO abatement alternatives. At that time, the Storm Water Management Model (SWMM) software was used to create the model. That model software was selected because it was accepted by EPA and MassDEP, was commonly used for sewer system modeling, and was used for the City's sewer system modeling performed as part of the regional CSO study in the late 1980s. The regional model was used, where appropriate, to facilitate the development of the Holyoke sewer system model as part of the May 2000 draft CSO LTCP.

Since 2008, the model developed as part of the draft CSO LTCP has been updated by Suez to reflect CSO abatement projects since the original draft CSO LTCP was prepared in 2000. The City's model was refined as part of this project, and then used to develop and evaluate CSO abatement alternatives. The following changes were made to the sewer system model to improve accuracy:

1. Surface and pipe invert elevation data was collected along the Front Street Interceptor, the Jefferson Street Sewer, and the Day Brook Sewer and used to refine pipe slopes and depths in the model.
2. Record drawings for the North, South, and Highland Park Interceptors were reviewed and the model was adjusted based on this data.
3. Changes were made at the CSO 9 Regulator to better reflect Suez's control of the flow split between the WWTF and the Berkshire Street CSO Treatment Facility.
4. Changes were made at the Highland Park Pump Station to better reflect the actual pump rates based on Suez's pump flow data.
5. An additional sewershed and an existing regulator were added to the model on Dartmouth Street, near Jefferson Street, in Drainage Area 23 to improve model accuracy.
6. An additional CSO (CSO 17), located at the Front Street/Lyman Street intersection, was identified by the City and added to the model.

5 CSO Control Policies

National CSO Control Policy – Under EPA's current (1994) CSO control policy, permittees are required to characterize their sewer systems, demonstrate implementation of the nine minimum controls (NMCs) established by the policy and develop a long-term CSO control plan. Compliance with the NMCs is documented by the City annually, as required by its WWTF National Pollutant Discharge Elimination System (NPDES) permit. The EPA policy also requires that the long-term CSO control plan be developed using either a "presumption" approach or a "demonstration" approach. Under the *presumption approach*, compliance with water quality standards is presumed if one of the following performance criteria is met:

1. No more than an average of four overflow events per year occur on an annual average basis.
2. The elimination or capture for treatment of no less than 85 percent by volume of the combined wastewater flow collected on a system-wide annual average basis during precipitation events, as clarified in the 1995 EPA Guidance for Long-Term Control Plan document.
3. The elimination or removal of no less than the mass of pollutants causing water quality impairment for the volume reductions noted in Item 2 above.

The *presumption approach* does not release municipalities from the overall requirement of meeting applicable water quality standards. If the permitting authority determines that the long-term CSO control plan will not result in attainment of water quality standards, more stringent controls may be required.

Under the *demonstration approach*, compliance with water quality standards is confirmed through the CSO control planning process. This approach provides flexibility in developing a long-term CSO control plan. While not necessarily satisfying the performance criteria of the *presumption approach*, the plan must be proven to adequately meet water quality standards. The *demonstration approach* depends on a detailed assessment of receiving waters and the impacts of CSO discharges and other sources of wet weather pollutants on water quality.

The *presumption approach* was used in this evaluation.

Massachusetts CSO Control Policy - MassDEP's August 1997 CSO policy established the following goals:

1. Elimination of receiving water impacts is the primary goal.
2. Where the elimination of CSOs is not feasible, the goal is minimization of impacts to the maximum extent feasible and attaining the highest water quality achievable. In these areas, the identification and protection of critical uses is essential.

6 Development of CSO Abatement Alternatives

A wide variety of technologies and approaches for the abatement of CSO impacts on receiving water quality were considered as part of this evaluation. The CSO abatement technologies ranged from relatively low-cost, "soft" approaches, such as street sweeping and catch basin cleaning, to high-cost, high-tech approaches, such as the construction of satellite treatment or storage facilities to abate CSO discharges. The different types of available CSO abatement technologies and approaches are generally classified under one of the categories listed below, as recommended in EPA's 1995 *Combined Sewer Overflows: Guidance for Long-Term Control Plan*:

- Source controls
- Collection system controls
- Storage technologies
- Treatment technologies

Although it is recommended that the City pursue many of the source controls and collection system controls described in the report, such as the removal of infiltration/inflow (I/I) sources previously identified in the wastewater collection system, the majority of the source controls and collection system controls identified are expected to provide only a small (or no) reduction in CSO discharges. As such, the abatement alternatives developed in this report have focused on those abatement measures that are expected to have a significant impact on CSO discharges, including sewer separation, stormwater storage, CSO storage, satellite CSO treatment and upgrading the existing wastewater treatment facility.

6.1 Screening Level Analysis

A screening level analysis was performed that compared the screening level costs for sewer separation, storage and treatment for each CSO. In accordance with the approved Work Plan, costs were developed for CSO storage and treatment facilities that reduce the number of untreated overflows per year to no greater than 0, 4, or 8 in this screening level analysis. This comparison was used to identify alternatives that could be eliminated from further review. Generally, sewer separation is the preferred abatement alternative, where affordable, as noted in the 1997 Massachusetts Guidance for Abatement of Pollution from CSO Discharges. As such, where sewer separation was determined to be a lower cost than storing or treating CSO discharges (or a similar cost to CSO storage or treatment), then sewer separation was recommended. Note that the sewer separation costs were primarily compared to the cost of CSO facilities that reduce the number of untreated overflows per year to no greater than 4. As noted previously, one of the Federal CSO policy performance criteria under the *presumption approach* is that no more than an average of 4 overflow events per year occur on an annual average basis.

The screening level costs include estimated capital costs and operation and maintenance costs over a 20-year period. The capital costs include construction costs and engineering costs. The construction costs include material costs, installation costs, general conditions costs, the contractor's overhead and profit, and a 30% contingency. The sewer separation costs include the cost of rehabilitating existing combined sewer piping that will either be converted to a storm drain or a sanitary sewer. The inclusion of these costs is appropriate since during design some existing piping is typically found to be in poor condition, requiring rehabilitation. In order to compare CSO treatment/storage facility alternatives to sewer separation alternatives on an equivalent basis, the cost of rehabilitating existing piping was also included in the CSO facility alternatives since these piping improvements will still be needed.

Sewer separation was determined to be the least expensive alternative for CSOs 2, 8, 18A, 19, 20 and 23. CSO storage and treatment facilities were less expensive for CSO 18 and a CSO treatment facility was less expensive for CSO 21. Conveyance of the CSO 7 overflows to the South Interceptor was determined to be less expensive than sewer separation, storage or treatment.

Where CSO storage or treatment was determined to be a lower cost, a siting analysis was performed to determine whether there is available land that is suitable for construction of a storage or treatment facility. The siting analysis considered land ownership, space available, neighborhood impacts, and necessary site improvements.

6.2 CSO 18 Alternatives Analysis

For CSO 18, The only open land identified near the CSO regulator and outfall large enough to accommodate a storage or treatment facility is park land owned by the City (Pulaski Park). The park is bordered by a residential neighborhood to the south, Route 202 to the west, and the Connecticut River and the First Level Canal to the north and east. Pulaski Park is over 14 acres in size and includes walking paths, benches, a playground, a spray park, a basketball court, a volleyball court and a skate board park. The majority of these park facilities are located at the eastern end of the park. The Highland Park Wastewater Pump Station is located at the western end of the park. The most western section of the park is located between the pump station and Route 202 and is a wooded area adjacent to the railroad tracks. Because there are currently no developed recreational facilities within this wooded section of the park, this location was selected for a proposed CSO treatment or storage facility.

Concerns related to siting a CSO facility at this location include:

1. The park land is protected under Article 97 of the Amendments to the Constitution of the Commonwealth, EOAA Land Disposition Policies, and a change in its use would require special legislation. As such, acquisition of this land for a CSO facility may be difficult.
2. Pulaski Park was placed on the National Historic Register in 2004. Because the park is a historic location, construction of a CSO facility at the park may not be allowed.
3. Pulaski Park has been the focus of restoration efforts by the City, as is noted in the City's 2013-2018 Open Space and Recreation Plan. As evidence of this, over the last 10 years the City constructed a new playground, spray park, skate park, a cross-fit training facility, and benches.
4. A new CSO facility at the park could have a negative aesthetic impact on park users and the adjacent residential neighborhood.
5. There is the potential for odors associated with storing and/or treating wastewater flow, which may impact park users and the adjacent residential neighborhood.

Because of the siting concerns noted, additional abatement alternatives for CSO 18 were considered through supplemental analyses.

6.2.1 Supplemental CSO 18 Analyses

A more detailed analysis of CSO abatement alternatives for Drainage Area 18 was performed that included refining CSO storage and treatment costs. In addition, because of the concerns noted regarding siting a CSO facility in Drainage Area 18, at Pulaski Park, partial sewer separation alternatives were developed that result in 4, 8 and 16 overflows per year. The

alternatives that would result in 4 or 8 overflows per year were established based on the Work Plan. The remaining partial sewer separation alternative was developed to reduce costs based on the configuration of the existing piping in this drainage area. Hydraulic modeling simulations indicate that this lower cost partial sewer separation alternative results in 16 overflows per year.

Complete sewer separation provides the greatest level of abatement but is the most expensive alternative. Partial sewer separation alternatives provide the advantage of allowing the City to more easily implement additional abatement in this drainage area, if determined to be necessary, when compared to CSO storage/treatment alternatives. In addition, the sewer separation alternatives provide the benefit of not requiring the construction of a CSO facility in Pulaski Park, which may not be allowed because the park is protected land and a historic location. Partial sewer separation that results in 8 overflows per year is not recommended since it provides a lower level of abatement than sewer separation that results in 4 overflow per year with only a small reduction in cost.

As noted above, there are significant siting concerns related to construction of a storage or treatment facility at Pulaski Park. The CSO 18 alternatives were reviewed in greater detail as part of the development of system-wide alternatives.

6.3 CSO 21 Alternatives Analysis

For CSO 21, because the CSO 21 Regulator is located at the bottom of a steep embankment, the most appropriate location for a CSO treatment facility is at the bottom of this embankment. However, flat ground at the bottom of the embankment is limited. As such, significant earthwork/regrading would be needed in order to construct a treatment facility at this location and provide vehicle access to it. The cost of a CSO treatment facility at this location was increased to reflect the difficult site conditions.

Concerns related to siting a CSO facility at this location include:

1. The property where the CSO 21 Regulator is located and the proposed location of the CSO 21 treatment facility is privately owned; the property owner may not be willing to sell the property to the City. If the City were to attempt to take the land by eminent domain, significant legal action may be necessary.
2. Construction of a CSO treatment facility at this location will be challenging due to the small area of flat land and the steep slopes.
3. The treatment facility would be located in a residential neighborhood; the construction of a CSO treatment facility at this location may not be accepted by the nearby residents.
4. There is the potential for odors associated with treating wastewater flow at this location, which may impact the adjacent residential neighborhood.

Considering the above concerns and the fact that there is only a small difference in cost between sewer separation in Drainage Area 21 and the cost of constructing a CSO treatment facility (1% difference), sewer separation is recommended over construction of a CSO treatment facility at CSO 21.

Sending additional combined flow to the WWTF or the Berkshire Street CSO Treatment Facility were also considered during the screening level analysis. It was determined that neither facility has surplus capacity to accommodate additional flow and that there is little space available to expand these facilities. In addition, it was noted in the report that improvements at the WWTF to provide additional nitrogen removal may be necessary in the future and that these improvements may require use of the little space available to

construct additional tankage to meet nitrogen removal requirements. In addition, in order to convey additional combined flow from upstream areas (CSOs 18, 19, 20, 21 and 23) to the existing treatment facilities, a new interceptor would need to be constructed because the Front Street Interceptor has insufficient surplus capacity to accommodate the upstream CSO discharges.

6.4 Day Brook Alternatives Analysis

Day Brook is a significant water course that enters the combined sewer system at the upstream end of the CSO 9 Drainage Area. In order to reduce untreated CSO 9 discharges, detention and removal of Day Brook from the sewer system were evaluated in this study. The cost to detain flow peaks from Day Brook during wet weather events was estimated as approximately $2.0 million and this alternative would reduce the annual volume of overflow during a typical year by 6.8 MG. Several Day Brook removal pipeline alternatives were considered in this evaluation. The estimated capital cost of the preferred layout for a new storm drain that would convey Day Brook to the canal system is $12.8 million. The removal of Day Brook from the sewer system would reduce the annual overflow volume by approximately 7.9 MG during a typical year and reduce the average daily flow to the WWTF by approximately 1.2 MGD.

6.5 System-Wide Alternatives Analysis

A total of six system-wide alternatives to reduce the annual number of CSO activations and volume were developed and are summarized in Table EX-2.

Model simulations indicate that during a typical year each of the six alternatives will reduce the total City-wide CSO flow volume by 90% or more. In addition, model simulations indicate that each alternative will result in the elimination or capture for treatment of no less than 85 percent by volume of the combined wastewater flow collected on a system-wide annual average basis.

The Federal CSO policy indicates that under the *presumption approach* compliance with water quality standards is achieved if one of the following performance criteria is met:

1. No more than an average of four overflow events per year occur on an annual average basis.
2. The elimination or capture for treatment of no less than 85 percent by volume of the combined wastewater flow collected on a system-wide annual average basis (during precipitation events), as clarified in the 1995 EPA Guidance for Long-Term Control Plan document.
3. The elimination or removal of no less than the mass of pollutants causing water quality impairment for the volume reductions noted in Item 2 above.

Based on Criteria 2 above, each of the six system-wide alternatives developed meets the CSO policy goals.

APPENDIX A

TABLE EX-2

Summary of System-Wide Alternatives[8]

System-Wide Alternatives (Costs in $M)	Capital Cost ($M)[1,3,4]	Total Project Cost ($M)[2,3,4]	No. of Overflow Activations Remaining	Annual CSO Volume Removed (MG)	% CSO Removal[5]	Annual % of System Flow Removed/ Captured[6]	Advantages	Disadvantages
Alternative 1							-Greatest level of abatement -Greatest reduction in flow to the WWTF -Eliminates CSO discharges to a sensitive area of the river (just upstream of dam at CSO 18)	-Highest cost alternative -Will likely take the longest to complete
7 - Sewer separation -	$4.7	$4.7	0					
Day Brook - Remove Flow From Sewer System[7] -	$12.8	$10.2	3	**131**	**93%**	**94%**		
18 - Full Sewer Separation -	$51.5	$51.5	0					
Separation of 2, 8, 18A, 19, 20, 21, 23 -	$51.2	$51.2	0					
Subtotal	**$120.1**	**$117.5**				**$/gal:**	**$0.90**	
Alternative 2							-≤4 activations/year achieved at all CSOs -Reduces CSO discharges to a sensitive area of the river (just upstream of dam at CSO 18)	-Area 18 storage facility would be located on Parks & Rec land; change in use requires special state legislation
7 - Convey overflow to the South Interceptor -	$0.2	$0.7	4					
Day Brook - Detention -	$1.4	$1.8	3	**124**	**92%**	**95%**		
18 - Storage - 4 Activations (2.5 MG) -	$20.8	$31.6	4					
Separation of 2, 8, 18A, 19, 20, 21, 23 -	$51.2	$51.2	0					
Subtotal	**$73.6**	**$85.2**				**$/gal:**	**$0.68**	
Alternative 3							- ≤4 activations/year achieved at all CSOs -Lower cost than Alts 1 & 2	-Area 18 treatment facility would be located on Parks & Rec land; change in use requires special state legislation -Does not reduce the number of CSO discharges to the river, although treatment would be provided
7 - Convey overflow to the South Interceptor -	$0.2	$0.7	4					
Day Brook - Do Nothing -	$0.0	$0.0	3	**122**	**91%**	**95%**		
18 - Treatment - 4 Activations (62 MGD) -	$20.5	$33.8	4					
Separation of 2, 8, 18A, 19, 20, 21, 23 -	$51.2	$51.2	0					
Subtotal	**$71.9**	**$85.7**				**$/gal:**	**$0.70**	
Alternative 4							-≤4 activations/year achieved at all CSOs -Lower cost than Alts 1, 2, & 3	-Area 18 storage facility located on Parks & Rec land; change in use requires special state legislation
7 - Convey overflow to the South Interceptor -	$0.2	$0.7	4					
Day Brook - Do Nothing -	$0.0	$0.0	3	**117**	**90%**	**94%**		
18 - Storage - 4 Activations (2.5 MG) -	$20.8	$31.6	4					
Separation of 2, 8, 18A, 19, 20, 21, 23 -	$51.2	$51.2	0					
Subtotal	**$72.2**	**$83.5**				**$/gal:**	**$0.71**	
Alternative 5							-≤4 activations/year achieved at all CSOs -Reduces CSO discharges -Does not rely on obtaining Parks & Rec land for siting a CSO facility -Additional abatement is more easily implemented	-High cost
7 - Convey overflow to the South Interceptor -	$0.2	$0.7	4					
Day Brook - Do Nothing -	$0.0	$0.0	3	**122**	**91%**	**95%**		
18 - Partial Sewer Separation - 4 Activations -	$39.5	$40.8	4					
Separation of 2, 8, 18A, 19, 20, 21, 23 -	$51.2	$51.2	0					
Subtotal	**$90.9**	**$92.6**				**$/gal:**	**$0.76**	
Alternative 6							-Lowest cost alternative -May be completed in a shorter timeframe -Does not rely on obtaining Parks & Rec land for siting a CSO facility -Additional abatement is more easily implemented	-CSO 18 still >4 activations per year; contingent on approval of 85% reduction
7 - Convey overflow to the South Interceptor -	$0.2	$0.7	4					
Day Brook - Do Nothing -	$0.0	$0.0	3	**116**	**90%**	**93%**		
18 - Partial Sewer Separation - 16 Activations -	$25.4	$27.8	16					
Separation of 2, 8, 18A, 19, 20, 21, 23 -	$51.2	$51.2	0					
Subtotal	**$76.8**	**$79.7**				**$/gal:**	**$0.69**	

[1]Capital cost estimates include construction costs, engineering costs (20%) and a construction contingency (30%).

[2]Total cost includes total capital cost, O&M, and an allowance for routine sewer system lining/replacement.

[3]Costs are based on a December 2019 Engineering News Record Construction Cost Index of 11,381.

[4]These are Engineer's Opinions of Probable Costs. Tighe & Bond has no control over the cost or availability of contractor's labor, equipment or materials, or over market conditions or the contractor's method of pricing, and the Opinions of Probable Cost are made on the basis of Tighe & Bond's professional judgment and experience. Tighe & Bond makes no guarantee nor warranty, expressed or implied, that the cost of the Work will not vary from the Opinions of Probable Cost.

[5]Percentage of 1976 annual total combined sewer system flow that is no longer released untreated to the river. The original volume, prior to any CSO abatement (subsequent to the 2000 draft CSO LTCP), is estimated to be 475 MG per the 2019 model results.

[6]Percentage of 1976 annual total combined sewer system flow that will be captured for treatment or eliminated during storm events, based on the sewer system flows in place prior to the implementation of CSO improvements after the 2000 draft CSO LTCP was completed. The dry weather flow is not included in the calculation.

[7]The total project cost includes the reduction in operation and maintenance costs at the WWTF related to the reduction in average daily flow once Day Brook is removed from the sewer system.

[8]This comparison excludes abatement of CSO 11 since the abatement approach will be the same for each alternative. Sewer separation has been designed for Drainage Area 11 and construction is expected to begin in 2020.

The system-wide analysis evaluated, through hydraulic modeling, the total impact on the wastewater collection system of the proposed improvements under each alternative. The following components of the system-wide alternatives were considered for this analysis:

- **Day Brook** – Three alternatives were considered for Day Brook: do nothing, detention to reduce peak flows during storm events, or completely removing the brook flow from the sewer system through the construction of a drain pipe to convey the brook to the Connecticut River or the canal system. Model results indicate that if Day Brook is not detained or removed from the sewer system, the number of untreated discharges to the Connecticut River at CSO 9 would still be reduced to 4 per year, on average, due to the proposed improvements in other areas.
- **WWTF Upgrades** - Similar to the above, if no improvements to the WWTF are made to accommodate additional flow, the number of untreated discharges to the Connecticut River at CSO 9 would still be reduced to 4 per year, on average, due to the proposed improvements in other areas.
- **CSO 7 -** The South Interceptor is expected to have the capacity to accommodate the overflow from CSO 7 since the flow removed through separation in Drainage Areas 2 and 8 is predicted to be greater than the flow added by the CSO 7 overflow during each of the storms measured in 1976 (the typical year used for the model simulation).
- **CSO 18 –** As discussed above, CSO abatement through complete sewer separation, partial sewer separation, storage, and satellite treatment, was considered.
- **CSOs 2, 8, 18A, 19, 20, 21, and 23 -** Each alternative included the complete sewer separation of Drainage Areas 2, 8, 18A, 19, 20, 21 and 23, which were determined to be more appropriate and/or cost effective than satellite treatment or storage alternatives during the screening analysis.

Note that System-Wide Alternative 1 was developed to represent the alternative that is expected to provide the greatest level of abatement. However, this alternative would have the highest cost.

6.5.1 System-Wide Alternative Selection

The system-wide alternatives analysis determined that the most cost-effective approach to achieving the CSO policy goals is to implement all or part of Alternative 6, which includes the following components listed in Table EX-2:

TABLE EX-3
Alternative 6 Components[2]

Drainage Area	Recommended Abatement	Capital Cost ($M)	Total Project Cost ($M)
11[1]	Sewer separation	$8.6	$8.6
2, 8, 18A, 19, 20, 21 & 23	Sewer separation	$51.2	$51.2
7	Divert flow to South Interceptor	$0.2	$0.7
18	Partial sewer separation (≤16 overflows/year)	$25.4	$27.8
TOTAL		**$85.4**	**$88.3**

[1]Design of sewer separation in this area is complete and construction is expected to begin in the spring of 2020.

[2]This alternative will eliminate or capture for treatment no less than 85 percent by volume of the combined wastewater flow collected on a system-wide annual average basis, which is one of the acceptable performance criteria described in the National CSO policy under the *presumption approach*.

Alternative 6 is the lowest cost system-wide alternative and meets the federal CSO policy goal under the *presumption approach* of eliminating or capturing for treatment of no less than 85 percent by volume of the combined wastewater flow collected during rain events on a system-wide annual average basis. Alternative 6 results in a 90% reduction in overflow volume annually and results in the capture or elimination of 93% by volume of the combined wastewater flow collected on a system-wide annual average basis.

Advantages of this system-wide alternative include:

1. Lowest cost.
2. Meets the water quality goals under the *presumption approach*.
3. Likely to be more quickly implemented than more expensive alternatives.
4. It does not require the construction of a CSO treatment or storage facility at Pulaski Park in Drainage Area 18, which might not be allowed because the park is a historic site and is protected land in accordance with under Article 97 of the Amendments to the Constitution of the Commonwealth, EOAA Land Disposition Policies (a change in its use would require special legislation). In addition, the construction of a CSO facility at Pulaski Park has the potential to impact the adjacent neighborhood and park users.
5. Partial sewer separation of Drainage Area 18 removes more overflow volume than treatment or storage for the same number of overflows.
6. Additional abatement is more easily implemented with sewer separation alternatives, if determined to be necessary in the future.

In addition, to the above, note that Alternative 6 provides only a slightly lower level of abatement than Alternative 1, which provides the greatest level of abatement, as shown below:

Alternative	Total Project Cost ($M)[1]	% CSO removal
1	$126.1	93%
6	$88.3	90%

[1]Includes capital costs, operation & maintenance costs over a 20-year period, and an allowance for sewer lining/replacement over the 20-year period. Costs include Drainage Area 11 sewer separation.

6.6 Recommended CSO Abatement

A more detailed assessment of System-Wide Alternative 6 revealed that not all of the CSOs in the City would need to be abated in order to comply with the federal CSO control policy using the *presumption approach*.

The City proposes to implement the abatement projects described in Table EX-4, which would comply with federal CSO policy goals by achieving 87% capture or elimination of the combined flow within the wastewater collection system during wet weather events on an average annual basis, when considered in conjunction with prior CSO abatement projects. The abatement of these CSOs would also result in an 86% reduction in annual CSO volume, when considered in conjunction with prior CSO abatement projects.

TABLE EX-4
Recommended CSO Abatement Plan – 86% CSO Removal and 87% Capture

CSO No.	CSO Description	Recommended Abatement	Capital Cost ($M)	Annual CSO Volume Removed (MG)[1]	Cumulative % CSO Volume Reduction	$/CSO Gal Removed Annually
Previously Implemented CSO Abatement Projects				316.3	66.0%	---
11	Jackson St.	Sewer Separation	$8.60	17.8	69.7%	$0.48
8	Springdale Park	Sewer Separation	$9.56	21.4	74.2%	$0.45
21	River Terrace	Sewer Separation	$16.67	58.4	86.4%	$0.29
TOTAL	**---**		**$34.83**	**413.9**	**---**	**---**

[1]Based on a total annual overflow volume of 479.2 MG in 2000.

These three areas were selected for abatement because their implementation is the most cost-effective and would eliminate 3 of the 4 CSOs with the greatest overflow volume.

No further CSO abatement is proposed or required to comply with the federal CSO control policy.

7 Climate Vulnerability Assessment

The impact of climate change on the selection of CSO abatement alternatives was considered in this report. As part of this effort, historical rainfall and river level/flow data in the Holyoke area were reviewed. In addition, reports on regional rainfall and river level/flow trends were reviewed. This data and literature review confirmed that rainfall amounts and river flows have increased over the last 70+ years. In addition, the data indicates that there has been an increase in the number of extreme rain events.

The impact of climate change on the CSO abatement alternatives was evaluated as part of this assessment. Sewer separation is typically performed by installing new sewers to convey sanitary sewage and converting the existing combined sewers to storm drains. Generally, the quantity of sewage flow is not expected to be impacted by climate change and, correspondingly, the cost of sewer separation is not expected to be impacted by climate change. In addition, the level of abatement provided by sewer separation is not expected to be impacted by climate change.

Both the CSO treatment and storage facilities would be sized to prevent more than 4 overflows during a typical year. Climate change has resulted in an increase in the number of larger, more intense rain events. If this trend continues, a CSO treatment or storage facility sized based on the storms experienced today may not be large enough to prevent more than 4 overflows/year in the future. As such, a CSO treatment or storage facility is more likely to be impacted by climate change than sewer separation alternatives.

8 Affordability Analysis

The affordability of the recommended CSO abatement plan and the City's other non-CSO wastewater needs has been assessed as part of this study. The affordability analysis includes an evaluation of the financial impacts of CSO abatement on an "average" community based on income using an approach specifically developed by EPA for the CSO abatement program. The EPA analysis is commonly used as a first step in evaluating

project affordability. However, it is important to note that Holyoke is not an "average" community and this approach does not fully portray actual cost impacts. Since Holyoke is one of the most economically disadvantaged communities in the Commonwealth of Massachusetts, other considerations that assess Holyoke's ability to fund CSO abatement are also presented in this report (based primarily on the 2017 American Community Survey).

The following information confirms the greater financial challenges facing the City of Holyoke and its residents than an "average" community (based on economic conditions):

- Holyoke's median household income (MHI) of $37,954 is the third lowest in Massachusetts; Holyoke's MHI is only half of the state average of $74,167.
- Holyoke has the second highest poverty rate in Massachusetts; 29% of Holyoke's residents live below the poverty level vs. the state average of 11%.
- The number of Holyoke residents below the poverty level has nearly doubled since 1970.
- One quarter of the City's population that lives in the downtown area is especially impoverished with a median household income of $16,450; 55% of these residents live below the poverty level.
- Holyoke is one of only ten public school systems statewide that applied for and received approval for its schools to provide universal free lunch due to high poverty levels.
- Holyoke's unemployment rate of 10.2% is almost double the state average of 6.0%; in addition, Holyoke's Labor Participation Rate of 57% is well below the state average of 67%.
- Approximately 53% of the City's revenue is from state aid, which is well above the state average of 14%.
- 21% of the housing in Holyoke is subsidized or available for low-income residents.

The EPA financial capability approach compares the total annual residential costs for wastewater collection, treatment and CSO abatement with the median household income. In addition, certain indicators of the City's economic health are rated individually, and then combined for an overall rating. These two factors, the average annual residential sewer cost expressed as a percentage of the median household income (the Residential Indicator) and the consolidated rating of the economic indicators are then used to provide information on the impact of a project on the community, using the criteria established by EPA and summarized in Table EX-5.

TABLE EX-5
EPA Financial Capability Matrix

Permittee Financial Capability Indicator (Socio-economic, Debt and Financial Indicators)	**Residential Indicator** (cost per household as a % of median household income)		
	Low (< 1.0%)	**Mid-Range** (1.0 - 2.0%)	**High** (> 2.0%)
Weak (< 1.5)	Medium Burden	High Burden	High Burden
Mid-Range (1.5 – 2.5)	Low Burden	Medium Burden	High Burden
Strong (> 2.5)	Low Burden	Low Burden	Medium Burden

The City's Permittee Financial Capability Indicator score is 1.5 (at the low end of Mid-Range), based on its current bond rating, unemployment rate, median household income (MHI), and sewer enterprise system fee collection rate. This Permittee Financial Capability rating of Mid-Range is the result of the A1 bond rating score being "Strong". However, the other indicators that consider unemployment rate, MHI, and the sewer enterprise system fee collection rate are all considered weak, with scores of 1.0. The unemployment rate, MHI, and the sewer enterprise system fee collection rate provide a more accurate indication of how economically depressed the City is and therefore a "Weak" rating should be applied to Holyoke.

With a Permittee Financial Capability Indicator that is "Weak", the EPA methodology indicates that a High Burden is placed on a community when the Residential Indicator is greater than or equal to 1%, as shown in Table EX-5.

The City's current Residential Indicator is 1.0, based on its current wastewater operation and maintenance and debt service costs. This indicates that the City's wastewater costs currently place a High Burden on households earning the median household income. Note that the existing wastewater costs place an even higher burden on the City's large low-income population which earn well below the City's MHI of $37,954 (per the 2017 American Community Survey). As noted above, one quarter of the City's population that lives in the downtown area has a median household income of only $16,450.

The City's future wastewater costs were projected in this evaluation and included in the affordability assessment. Future wastewater costs include improvements expected to be necessary at the WWTF and within the wastewater collection system over the next 20 years, as well as the recommended CSO abatement. The most significant WWTF improvement anticipated is the potential need for nitrogen removal upgrades to comply with anticipated changes in permit requirements. The cost of these upgrades is estimated to be approximately $137 million based on a prior study performed for MassDEP. Within the wastewater collection system, we have assumed that 2% of the separated sewers and the combined sewers that are not included in the recommended plan will need to be rehabilitated or replaced over the next 20 years. In addition, we have assumed that rehabilitation of the Front Street Interceptor and the Day Brook Sewer will be needed over the next 20 years. Portions of these major sewer mains are over 150 years old. We also assumed that the Springdale Park Pump Station will be replaced during this 20-year period.

The calculated Residential Indicator values using the EPA affordability methodology are shown in Table EX-6 and illustrate that even if CSO abatement costs are not considered, the anticipated wastewater costs will place a High Burden on City residents. If WWTF nitrogen removal upgrades are required, the projected wastewater costs will be unaffordable without

supplemental grant funding assistance (regardless of whether CSO abatement is implemented).

TABLE EX-6
Residential Indicator Summary[1]

Condition	Residential Indicator-without WWTF Nitrogen Removal Upgrades	Residential Indicator-with WWTF Nitrogen Removal Upgrades
Existing WW Costs	1.0	1.0
Future WW Costs (Non-CSO only)	1.7	2.8
Future WW Costs (NON-CSO + CSO)	2.0	3.0

[1]The Residential Indicator is calculated as the estimated wastewater cost per household divided into the median household income.

More detailed financial models were also developed that confirmed the significant impacts that the CSO abatement projects and other anticipated wastewater needs will have on City residents, as described below.

1. A supplemental analysis of affordability was performed using the EPA methodology described above, modified as follows:
    a. Annual wastewater costs were developed based on proposed implementation and payback periods for each anticipated wastewater project and proposed CSO abatement project, rather than assuming equal annual costs over the implementation period. Design and construction periods were assumed using this approach. Refer to Figure EX-2.
    b. Longer implementation periods than 20 years were considered to reduce impacts to residents and businesses.
    c. It was assumed that CSO abatement projects will receive State Revolving Fund (SRF) loans at a 2% interest rate and that significant projects that are not expected to receive SRF loans will be funded with a 4.5% interest loan; 20-year bond periods were assumed.
    d. Construction costs were escalated from present day costs based on the change in the ENR Construction Cost Index from 2009 to 2018.
    e. Wastewater operation and maintenance (O&M) costs were escalated from present day costs based on the changes in the City's wastewater O&M costs from Fiscal Year 2000 to Fiscal Year 2018.
    f. The median household income (MHI) in Holyoke was escalated from present day costs based on the average percent change in the MHI from 2009 to 2017.

    Note that funding from supplemental special grants is not included in the analysis.

    The financial impacts are illustrated in Figure EX-3 and confirm that the proposed CSO abatement projects will place a High Burden on City residents with Residential Indicator values exceeding 1.5. In addition, Figure EX-3 confirms the need for significant funding assistance in the form of grants in order to implement either CSO abatement improvements or WWTF nitrogen removal upgrades (beyond an SRF loan, which has already been considered in the analysis).

2. A supplemental analysis of affordability was performed using an alternate methodology developed by several consultants for the American Water Works Association (AWWA), the National Association of Clean Water Agencies (NACWA), and the Water Environment Federation (WEF). This effort was prepared in anticipation of the EPA updating its financial capability assessment guidelines. This approach determines affordability using the following two indicators:

    a. Household Burden Indicator (HBI) - The HBI is calculated as the basic household water service costs (water and sewer combined) as a percentage of the 20th percentile household income (the Lowest Quintile of Income (LQI) for the service area). The basic water services costs per household are based on an assumed 50 gallons per person per day. The HBI attempts to reflect the economic impact on relatively low-income households. The benefit of using the fixed water consumption value noted is that it allows the analysis to focus on non-discretionary, basic water service costs, rather than average costs, which are more relevant to low-income households.

    b. Poverty Prevalence Indicator (PPI) - The PPI is calculated as the percentage of community households at or below 200% of the Federal Poverty Level (the Federal Poverty Level is $24,600 for a family of four). The PPI reflects the degree to which poverty is prevalent in a community, which indicates the prevalence of economic distress across the community. In Holyoke, 50% of the population live below 200% of the federal poverty level, per the 2017 American Community Survey Census data. This methodology indicates that PPI's greater than 35% place the highest burden on a community in this category.

In combination, the HBI and PPI metrics reflect both the household burden and the financial health of the community. The matrix presented in Table EX-7 provides benchmarks for determining the water/wastewater cost impacts on those households with incomes at or below the LQI. Note that for communities such as Holyoke with a PPI of greater than 35%, an HBI greater than 7% would place a High Burden on its residents.

TABLE EX-7
Benchmarks for Recommended Household Affordability Metrics

HBI[1]	PPI[2]		
	>35%	**20% to 35%**	**<20%**
>10%	Very High Burden	High Burden	Moderate-High Burden
7% to 10%	High Burden	Moderate-High Burden	Moderate-Low Burden
<7%	Moderate-High Burden	Moderate-Low Burden	Low Burden

[1]The Household Burden Indicator (HBI) is calculated as the basic household water service costs (water and sewer combined) as a percentage of the 20th percentile household income (the Lowest Quintile of Income for the service area).

[2]The Poverty Prevalence Indicator (PPI) is calculated as the percentage of community households at or below 200% of the Federal Poverty Level.

The financial impacts using this alternate methodology are illustrated in Figure EX-4 and confirm that the proposed CSO abatement projects will place a High Burden on City residents with Household Burden Indicator values exceeding 7.0 and, if WWTF nitrogen upgrades are implemented, exceeding 10.0. Similar to the supplemental EPA methodology, this alternate analysis confirms the need for significant funding assistance in order to implement either CSO abatement improvements or WWTF nitrogen removal upgrades.

9 Funding

Funding sources that may be available for CSO abatement projects include:

- The State Revolving Fund (SRF) Loan Program for wastewater improvements
- Federal/state grant funding

The State Revolving Fund (SRF) loan program for wastewater improvements has been established by the Commonwealth to assist communities in funding a wide variety of wastewater projects, including replacing/rehabilitating sewers, pump stations and wastewater treatment facilities. CSO improvements would also be eligible for funding under this program. Communities currently compete for low interest loans (2% for a 20-year loan) under this program. Disadvantaged communities can also qualify to receive partial loan forgiveness on the loan principal.

Over the past 20 years, limited federal and state grants have been made available for CSO abatement along the Connecticut River. The Mosher Street area, Jones Ferry Road area and Appleton Street area sewer separation projects were partially funded through federal grants. These grants funded 55% of the proposed improvements.

Grant funding is available to communities through the Community Development Block Grant (CDBG) program. The Community Development Fund (CDF) awards grants to eligible cities and towns to meet a broad range of community development needs in housing, infrastructure, revitalization, economic development and public social services. These grants could be applied to a future wastewater improvement project such as CSO abatement.

Due to the economic distress of the City and its extremely high poverty levels, supplemental grant funding will be required in order for the proposed CSO abatement improvements to be affordable. Without additional funding, it will be very difficult for the City to afford the three CSO projects, regular sewer rehabilitation and replacement, and regular wastewater system operation and maintenance; and it will not be possible to afford the WWTF nitrogen removal upgrades. In addition, it may be necessary to extend the implementation schedule beyond 20 years to lessen the financial burden on the City, depending on the amount of funding assistance available.

10 Recommended Plan

The City of Holyoke has been reducing CSO discharges over the last 20 years since the draft CSO LTCP was prepared. Completed CSO abatement projects include the Green Brook Separation Project that reduced CSO 21 discharges (2001), the Mosher Street Area Sewer Separation project that eliminated CSO 14 (2007), the Berkshire Street Satellite Treatment Facility that reduced untreated CSO 9 discharges (2007), the Front Street/Appleton Street CSO Regulator Adjustment (2007) that reduced CSO 16 discharges, the Jones Ferry Road Area Sewer Separation Project that eliminated CSO 3 (2012), and the Appleton Street Area Sewer Separation Project that eliminated CSO 13 (2012). These projects have reduced the annual CSO volume by approximately 316 million gallons (66%).

Proposed CSO abatement projects based on the results of this CSO LTCP Update include:

- Jackson Street Area (CSO 11) Sewer Separation
- Springdale Park (CSO 8) Sewer Separation
- Riverview Terrace (CSO 21) Sewer Separation

Design of the Jackson Street Area Sewer Separation Project has been completed and construction is scheduled to commence in 2020.

Abatement of CSO discharges from CSOs 8, 11, and 21 is recommended because:

1. Abatement of these three CSOs provides the lowest cost per gallon of CSO volume removed ("the biggest bang for the buck") and would eliminate 3 of the 4 CSOs with the greatest overflow volume.
2. Elimination of these CSOs, along with the prior CSO abatement described above, will result in greater than 85% removal of annual CSO volume over the next 20± years (86%). This abatement goal has been recommended by EPA for other CSO communities.
3. Elimination of these CSOs, along with the prior CSO abatement described above, will result in the elimination or capture for treatment of greater than 85 percent by volume of the combined wastewater flow collected on a system-wide annual average basis (from 76% under current conditions to 87%), which complies with the federal CSO abatement policy.

We recommend that CSOs 8, 11 and 21 abatement be implemented over the next 20 years, as summarized in Table EX-8. However, it is important to note that because Holyoke is one of the most economically disadvantaged communities in the state, significant grant funding assistance is needed in order for the City to afford either the proposed CSO abatement or WWTF nitrogen removal upgrades. In addition, it may be necessary to extend the implementation schedule beyond 20 years to lessen the financial burden on the City, depending on the amount of funding assistance available.

TABLE EX-8
Recommended CSO Abatement Plan

CSO No.	CSO Abatement Description	Capital Cost ($M)	Annual CSO Volume Removed (MG)	Cumulative % CSO Volume Reduction[2]	Implementation Schedule[1]
Previously Implemented CSO Abatement Projects			316.3	66.0%	---
11	Jackson St. sewer separation	$8.60	17.8	69.7%	2020-2022
8	Springdale Park sewer separation	$9.56	21.4	74.2%	2025-2029
21	River Terrace sewer separation	$16.67	58.4	86.4%	2035-2039
TOTAL	**---**	**$34.83**	**413.9**	**---**	**---**

[1]Includes design and construction.

[2]Based on a total annual overflow volume of 479.2 MG in 2000.

No further CSO abatement is proposed or required to comply with the federal CSO control policy.

Acknowledgments

We wish to thank you and Robert Peirent for your assistance throughout the project and the development of this report.

This report was prepared by Tighe & Bond personnel under the general supervision of William Hardy, PE and David Popielarczyk, PE.

Very truly yours,

TIGHE & BOND, INC.

William N. Hardy, PE
Chief Operating Officer

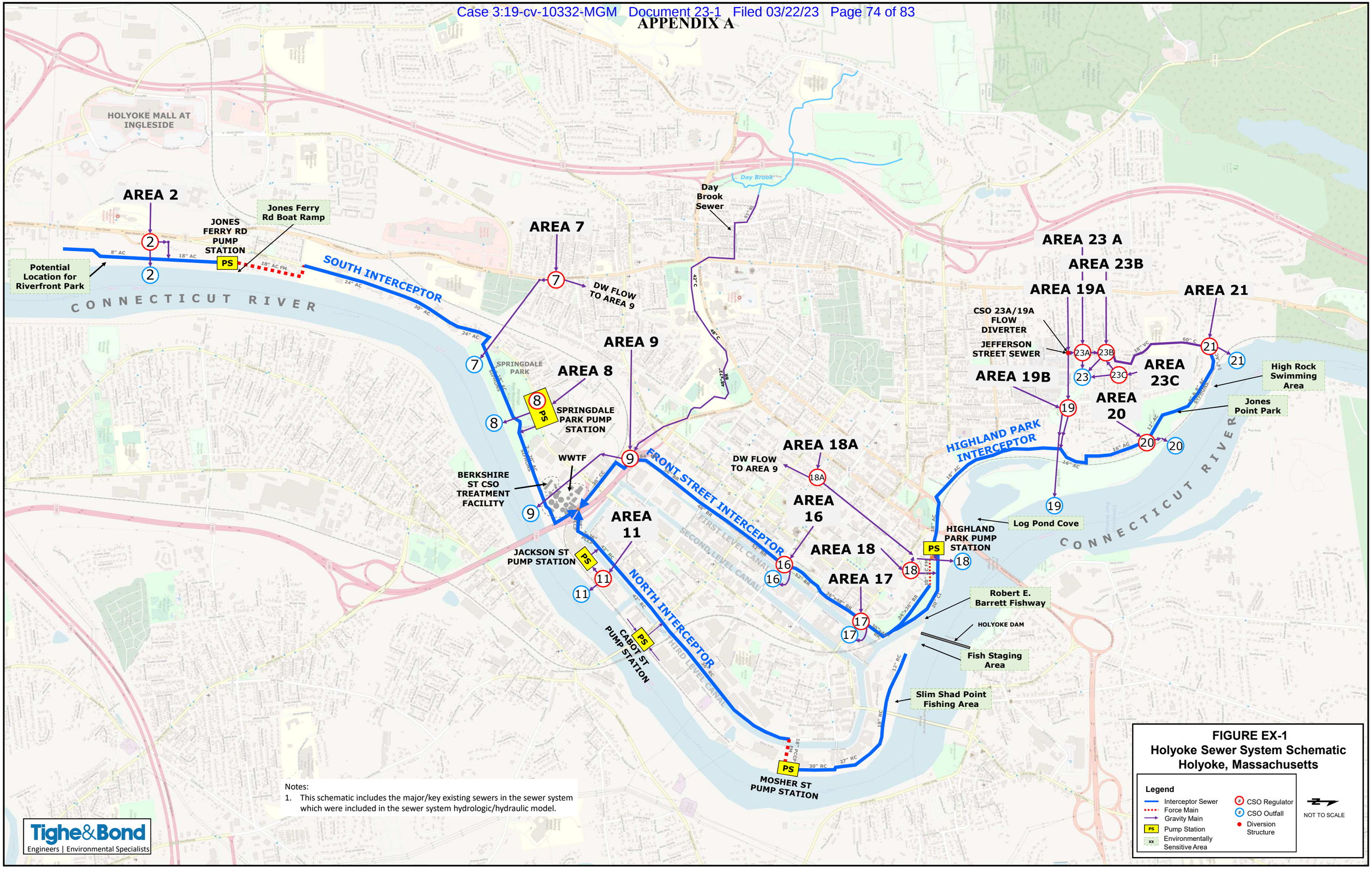
TIGHE & BOND, INC.

David J. Popielarczyk, PE
Principal Engineer/Associate

Enclosure

J:\H\H1471 Holyoke LTCP Update\003 LTCP Update\Report\Phases 1 & 2 Report-Draft\Rev 1\Executive Summary-Phases 1 And 2-Rev 1.Doc

APPENDIX A



Notes:
1. This schematic includes the major/key existing sewers in the sewer system which were included in the sewer system hydrologic/hydraulic model.

Tighe&Bond
Engineers | Environmental Specialists

FIGURE EX-1
Holyoke Sewer System Schematic
Holyoke, Massachusetts

Legend
- Interceptor Sewer
- Force Main
- Gravity Main
- PS Pump Station
- xx Environmentally Sensitive Area
- CSO Regulator
- CSO Outfall
- Diversion Structure

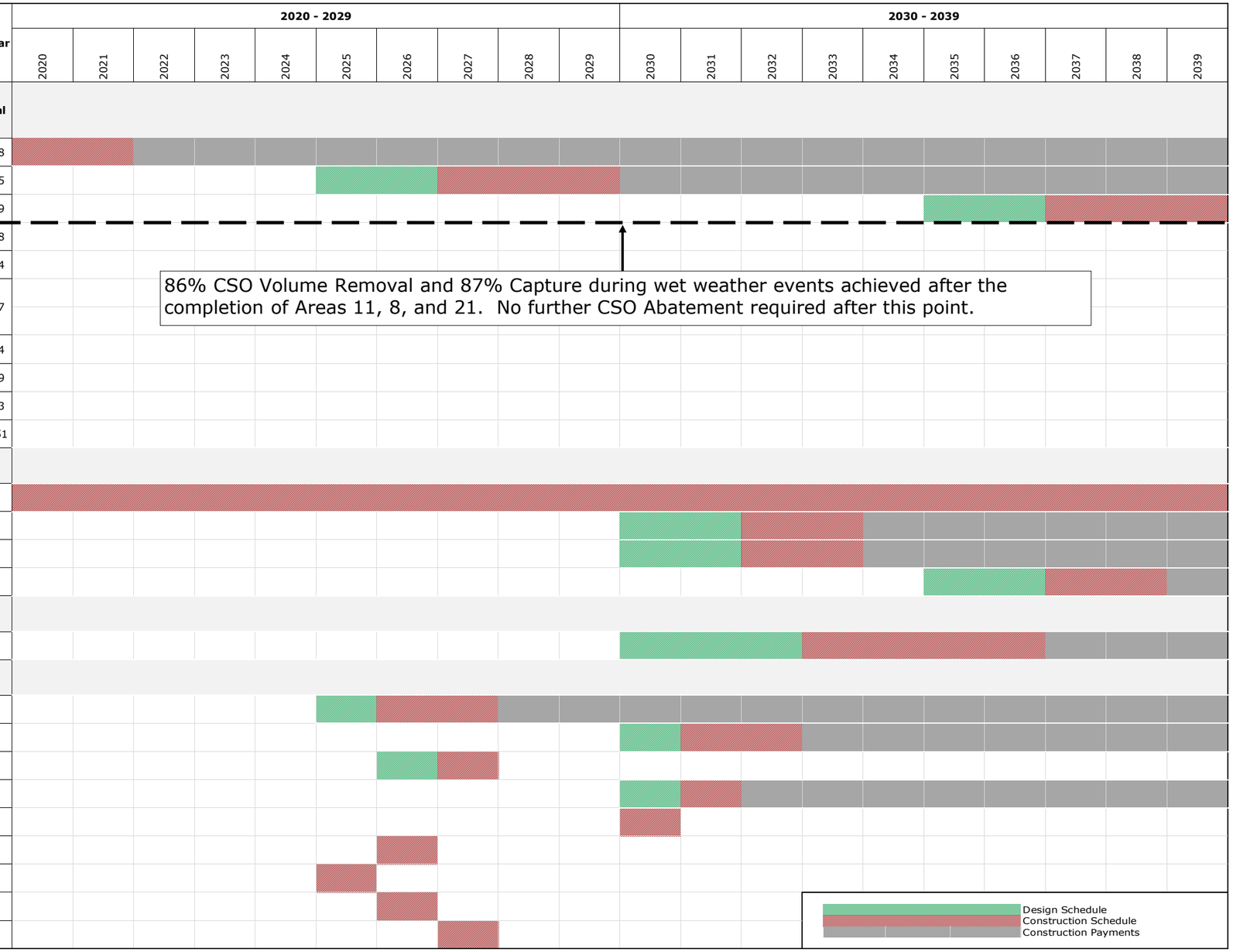
NOT TO SCALE

APPENDIX A

FIGURE EX-2

Wastewater Projects Implementation and Payment Schedule

CSO Abatement Program	Cost ($M)	CSO Vol. Red. (MG)	% CSO Removal	Reduction in # of Activations	$/gal
11 - Jackson Street	$8.6	17.8	69.7%	36	$0.48
8 - Springdale Park	$9.6	21.4	74.2%	32	$0.45
21 - River Terrace	$16.7	58.4	86.4%	67	$0.29
20 - Cleveland Street	$6.7	9.8	88.4%	47	$0.68
7 - Northampton St./Glen St.	$0.7	0.49	88.5%	8	$1.34
18 - Walnut Street - Phase A	$13.9	14.8	91.6%	5	$1.87
18 - Walnut Street - Phase B	$13.9				
23 - Jefferson Street	$8.2	4.0	92.4%	26	$2.04
18A - Essex St./Walnut St.	$4.4	1.31	92.7%	20	$3.39
2 - Providence Hospital	$0.8	0.15	92.8%	7	$5.23
19 - Yale Street	$4.8	0.16	92.8%	5	$29.51
Sewer Collection System					
Sewer Pipe Rehabilitation/Replacement Program (Ongoing)					
Springdale Park PS Replacement					
Front Street Interceptor Rehabilitation					
Day Brook Sewer Rehabilitation					
WWTF Denitrification Upgrades					
WWTF Denitrification Upgrades					
WWTF Upgrades					
Aeration System Improvements					
Electrical infrastructure improvements					
Emergency generator replacement					
New sludge press					
Influent pump replacement (six at 47 HP each)					
Repave parking lot (1,300 SY)					
Roof replacement-Admin Bldg					
Roof replacement-Oxygen Compressor Bldg					
Roof replacement-Effluent Pump & Chlorine Bldg					



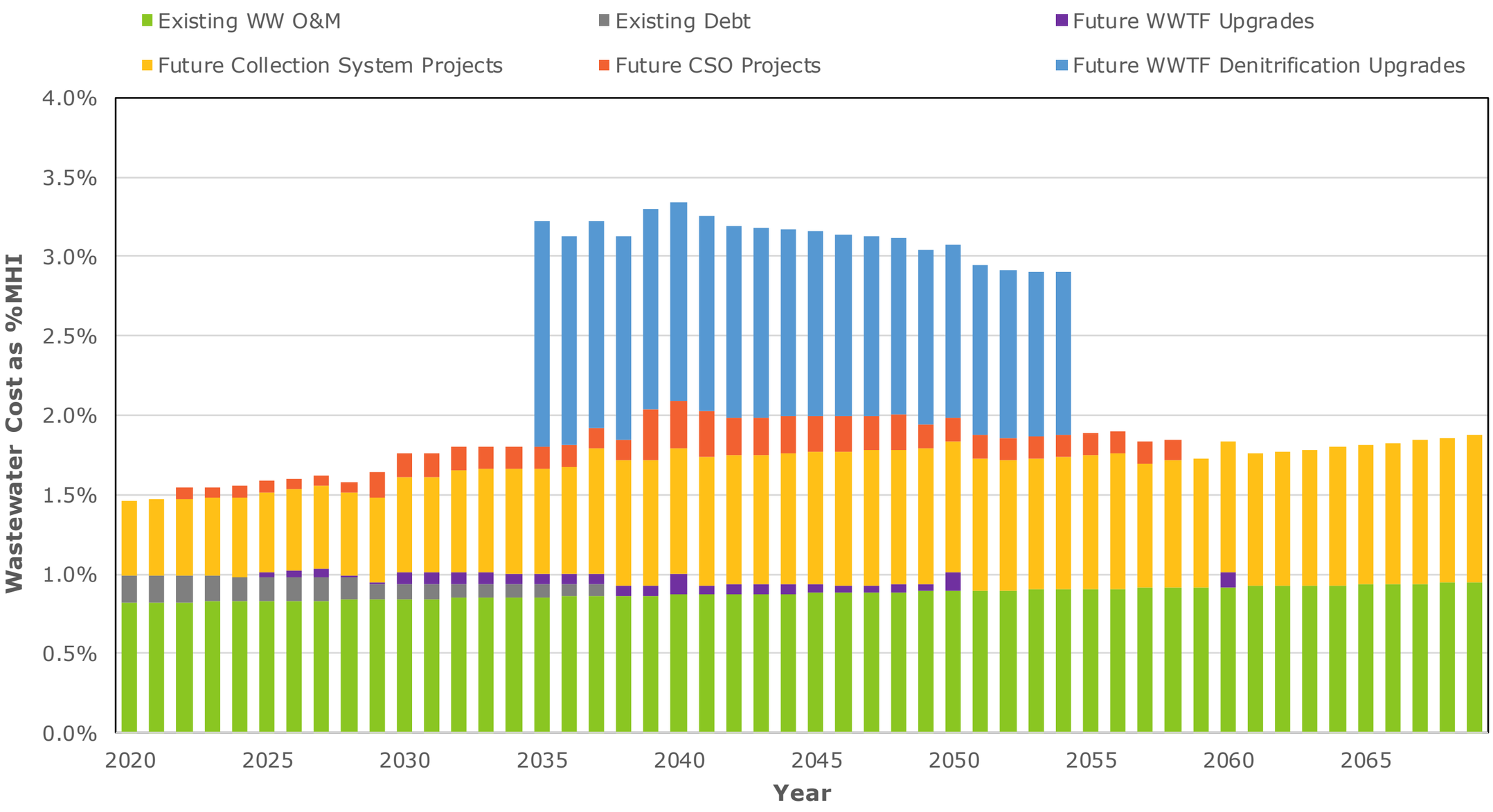


Figure EX-3

Annual Wastewater Cost as Percent MHI

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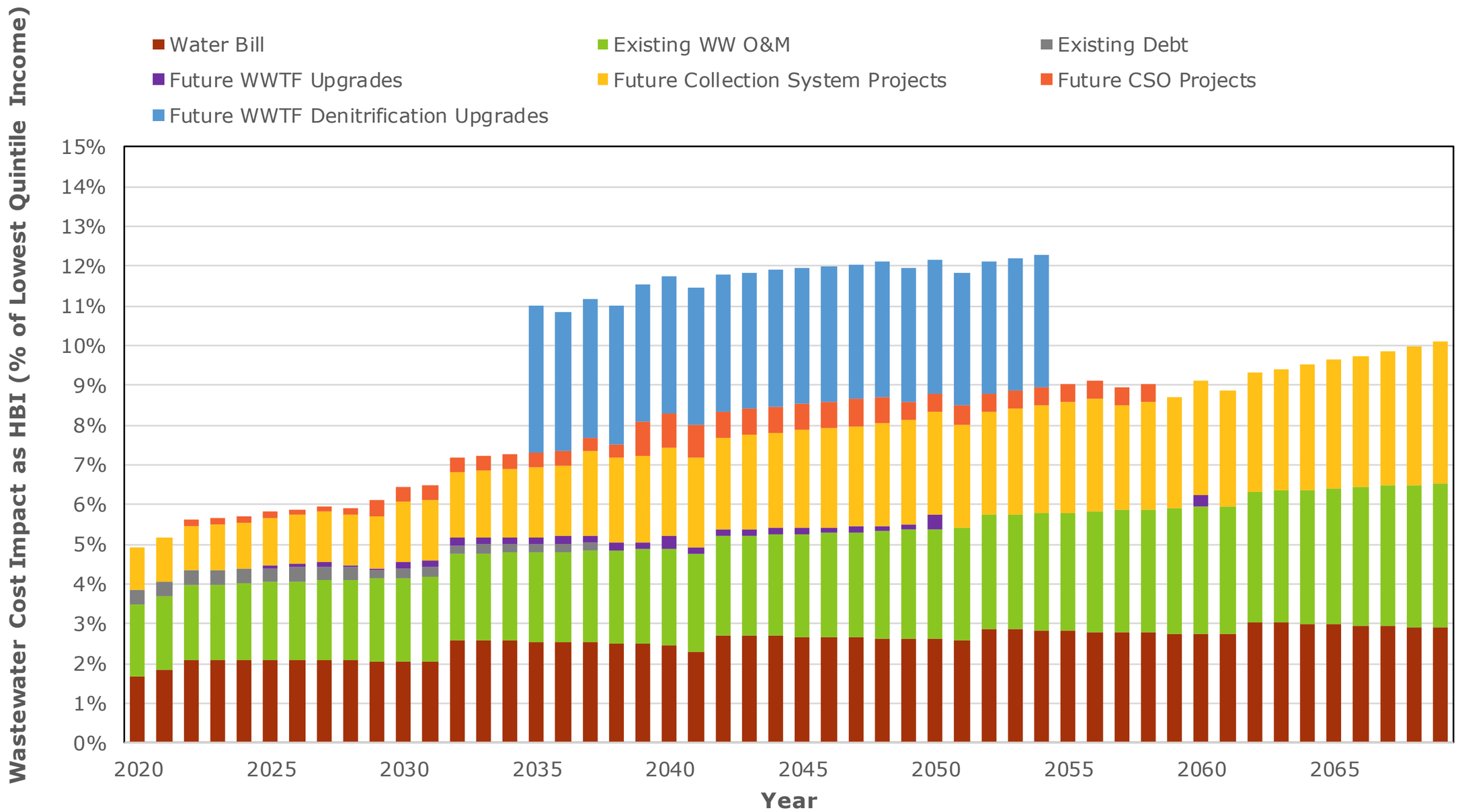

Figure EX-4

Annual Combined Water & Sewer Cost as Percent LQI

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APPENDIX B

Kudarauskas, Elizabeth A.

From: Robert Peirent <peirentr@holyoke.org>
Sent: Monday, April 4, 2022 3:19 PM
To: Koopman, Douglas
Cc: Kurpaska, Daniel J (DEP); Sokop, Matthew (DEP); Harrington, Brian D (DEP); Joshua Garcia
Subject: Re: Holyoke LTCP meeting

Follow Up Flag: Follow up
Flag Status: Flagged

Doug

Following up on our discussion earlier today, I've expanded upon the timeline for completion of CSO Area 8. The ultimate completion date hasn't changed but I have provided milestone dates for beginning the design and bidding/construction of the project. The new text is highlighted in yellow.

Please let me know if you have any questions or require any additional information.

- Completion of the Springdale Pond Drain Relocation Project (part of CSO Area 8) - December 31, 2022
- Completion of River Terrace Area 21A - December 31, 2027
- Completion of River Terrace Area 21B - December 31, 2029
- Begin design of CSO Area 8 - January 1, 2033
- Beginning bidding/construction of CSO Area 8 - January 1, 2035
- Completion of CSO Area 8 - December 31 2037

On Tue, Mar 22, 2022 at 4:33 PM Robert Peirent <peirentr@holyoke.org> wrote:

> Doug
>
> I reviewed the following timeline with Mayor Garcia this AM and received his approval to propose the following schedule.
>
> - Completion of the Springdale Pond Drain Relocation Project (part of CSO Area 8) - December 31, 2022
> - Completion of River Terrace Area 21A - December 31, 2027
> - Completion of River Terrace Area 21B - December 31, 2029
> - Completion of CSO Area 8 - December 31 2037
>
> These schedule changes were made in response to EPA's May 28, 2020 draft LTCP review letter. As requested, completion of Area 21 has been prioritized over Area 8. In addition, these projects have been accelerated somewhat from what was proposed in the draft LTCP.

A portion of Area 8, the Springdale Pond Drain Relocation Project was designed inhouse and the construction contract for this work has been awarded. It will be funded with ARPA funds. The remaining projects are anticipated to be funded using the MA Clean Water State Revolving Fund. The design of the River Terrace project is ongoing and is expected to continue through at least June 30, 2023, subject to availability of additional MassDEP/CT River Cleanup funds.

Given the City's ongoing financial challenges and the significant burden that projects like these place on the City's already stressed ratepayers, the two Area 21 projects are expected to coincide with year 3 and year 5 of EPA's BIL allocation to the MA Clean Water Trust Fund to maximize the potential for principal forgiveness as well as to coincide with retirement of a portion of the City's current SRF debt service.

We believe that the timeline presented above is a reasonable response to EPA's review comments and represents a good faith attempt by the City to continue to improve our compliance with the Clean Water Act and EPA's National CSO Control Policy.

Please let me know if you have any questions or require any additional information.

On Tue, Mar 8, 2022 at 4:34 PM Koopman, Douglas <koopman.douglas@epa.gov> wrote:

Bob

That is fine with me. I appreciate the update and your commitment to this project.

Lets shoot for March 25th

Thank you

Doug

Douglas Koopman

(617)918-1747

Koopman.Douglas@epa.gov

EPA Region I

5 Post Office Square, Suite 100

Mail code 04-03

Boston MA, 02109-3912

From: Robert Peirent <peirentr@holyoke.org>
Sent: Tuesday, March 8, 2022 3:51 PM

APPENDIX B

To: Koopman, Douglas <koopman.douglas@epa.gov>
Cc: Kurpaska, Daniel J (DEP) <daniel.j.kurpaska@state.ma.us>; Sokop, Matthew (DEP) <matthew.sokop@state.ma.us>; Harrington, Brian D (DEP) <brian.d.harrington@state.ma.us>
Subject: Re: Holyoke LTCP meeting

Doug - I'm coming up on my 60 day promised deadline for presenting a proposed schedule for completion of the City's CSO related projects that can be incorporated in an updated consent decree. I'd like to request pushing the deadline for submitting this schedule out to the COB March 25th. Things remain very hectic in Holyoke since we remain without a long-term DPW superintendent with Mike McManus' departure in early November. In addition, during this period a new mayor came on board along with multiple new City Councilors. We've also turned over 3 members of our BPW since then.

The good news, amongst all this transition, is that we continue to make progress on our CSO projects. Jackson St restarts on 3/21 with sewer lining and site restoration activities to complete, our Springdale Pond drain relocation project bids tomorrow, and our next phase of work on the River Terrace Area 21 project is underway.

Part of my reason for asking for more time is that I'm heading out on vacation on Thursday 3/10 and won't return until Friday 3/18. I will be getting together with Mayor Garcia when I return to confirm his commitment to the schedule that I will present to you by the 25th.

My last bit of news is that I'll be stepping away from my position as City Engineer on June 23rd. I've reached the point in life that I need to find a way to work less hours than I do in my current position. I don't know what my next adventure will be but expect that I'll figure something out.

Thanks

On Tue, Jan 4, 2022 at 10:26 AM Koopman, Douglas <koopman.douglas@epa.gov> wrote:

> Thank you all for getting back to me
>
> This coming Tuesday works for a meeting
>
> If I remember correctly, the original schedule of work that the City proposed was to due area 8, Springdale Park and then area 21 River Terrace.

We had discussed doing the Area 21 River terrace work first followed by area 8 work. all the while completing the Separation of CSO 11 and working on getting the discharge from Springdale pond out of the system. Also we had some discussion of blocking up CSO 17 over time as it has not been active.

I think where we are at is to get an updated schedule from the City which will be incorporated into the CD.

I might not have this completely correct but I think we can use it as a starting point for discussion.

Thank you

Talk to everyone on Tuesday

Doug

Microsoft Teams meeting

Join on your computer or mobile app

Click here to join the meeting

Join with a video conferencing device

sip:teams@video.epa.gov

Video Conference ID: 111 390 248 8

Alternate VTC instructions

Or call in (audio only)

+1 857-299-6148,,95128549# United States, Boston

Phone Conference ID: 951 285 49#

Find a local number | Reset PIN

For all EPA meetings, there is no expectation of privacy regarding any communications. Participation in a recorded meeting will be deemed as consent to be recorded. Information on EPA systems is the property of the Agency and may become official records.

APPENDIX B

Learn More | Meeting options

--

In person appointments available upon request. Please email or call with preferred time and date and I will confirm availability.

Bob Peirent, P.E.

Holyoke City Engineer

(413) 322-5605

City Hall Annex, Room 300

20 Korean Veterans Plaza

Holyoke, MA 01040-5019

--
In person appointments available upon request. Please email or call with preferred time and date and I will confirm availability.

Bob Peirent, P.E.
Holyoke City Engineer
(413) 322-5605

City Hall Annex, Room 300
20 Korean Veterans Plaza
Holyoke, MA 01040-5019

--
In person appointments available upon request. Please email or call with preferred time and date and I will confirm availability.

APPENDIX B

Bob Peirent, P.E.
Holyoke City Engineer
(413) 322-5605

City Hall Annex, Room 300
20 Korean Veterans Plaza
Holyoke, MA 01040-5019

APPENDIX C

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 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

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: _____

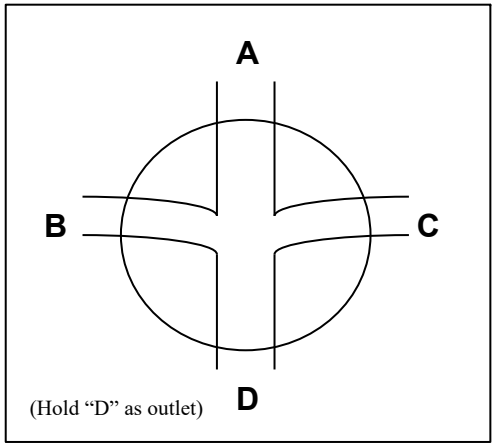
Inspector: _____

Date/Time: _____

Weather: _____

Street/Location: _____

General Comments: _____



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.

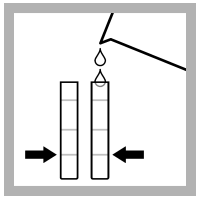
Replacement items

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

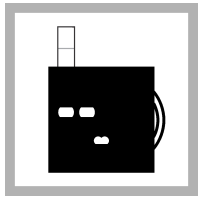
Optional items

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

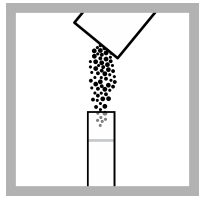
Test procedure—Ammonia-nitrogen (0–2.0 mg/L NH_3–N)



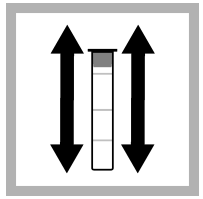
1. Fill two tubes to the first line (5 mL) with sample.



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

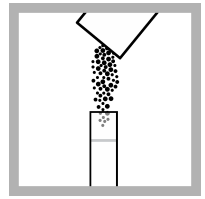


3. Add one Ammonia Salicylate Reagent Powder Pillow to the second tube.

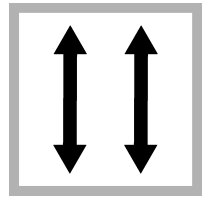


4. Put a stopper on the tube. Shake until the powder fully dissolves.

5. Wait 3 minutes.

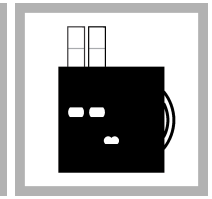


6. Add one Ammonia Cyanurate Reagent Powder Pillow to the same tube. Put a stopper on the tube.

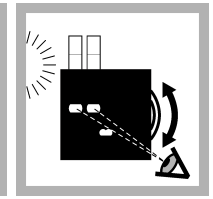


7. Shake until the powder fully dissolves.

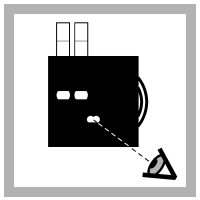
8. Wait 15 minutes. A green color develops.



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.

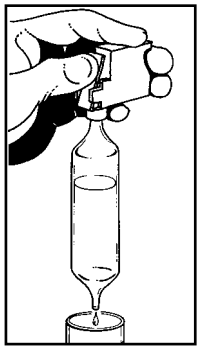


Figure 1

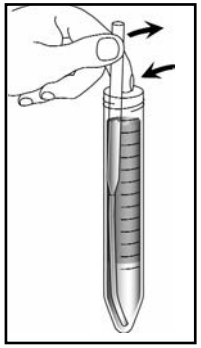


Figure 2

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).

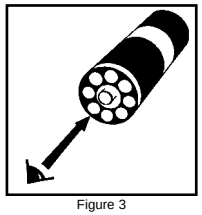


Figure 3

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)

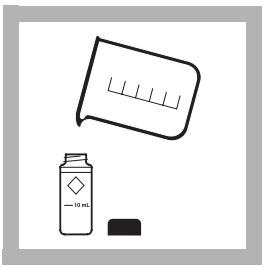
For water, wastewater and seawater

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.



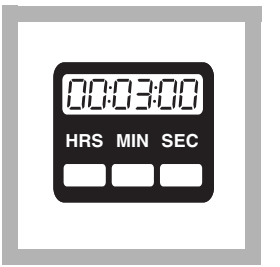
1. Fill a 10-mL cell to the 10-mL line with sample. Cap.

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.

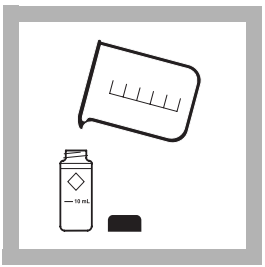
Note: *Gently shaking dissipates bubbles which may form in samples containing dissolved gases.*



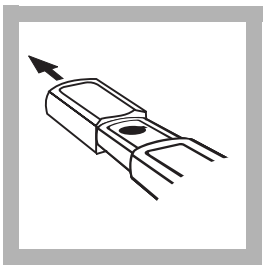
3. Wait 3 minutes. During this period, proceed with *steps 4–8*.

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

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

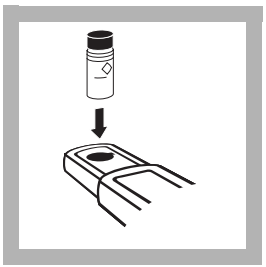


4. Fill a 10-mL sample cell to the 10-mL line with sample (the blank). Cap.



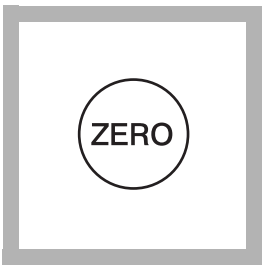
5. Remove the instrument cap.

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).

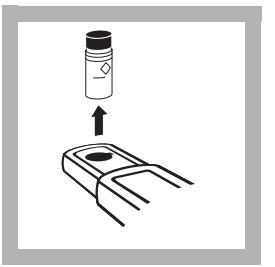
Note: *Wipe liquid off sample cells.*



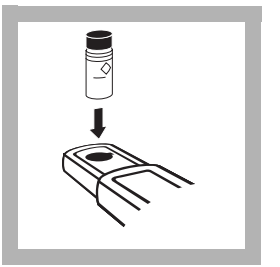
7. Press: **ZERO**

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.*

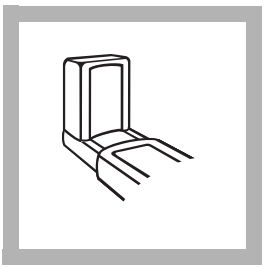


8. Remove the cell from the cell holder.

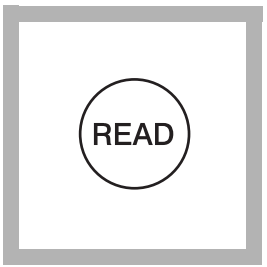


9. Within 3 minutes after the 3-minute reaction period, place the prepared sample in the cell holder.

Note: *Wipe liquid off sample cells.*



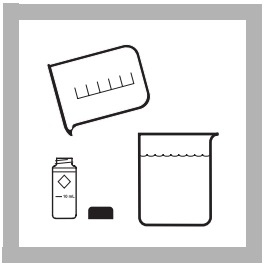
10. Cover the cell with instrument cap.



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

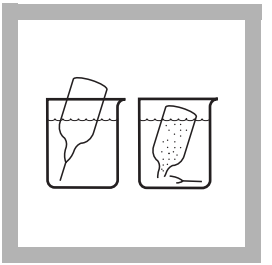
Note: *If the sample temporarily turns yellow after reagent addition or shows overrange (flashing* **2.20***), dilute a fresh sample and repeat the test. Some loss of chlorine may occur. Multiply the result by the dilution factor.*

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.

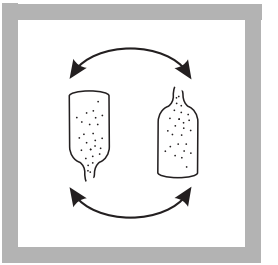
Note: *Samples must be analyzed immediately and cannot be preserved for later analysis.*



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.*

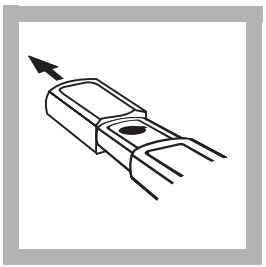


3. Quickly invert the ampule several times to mix. Wipe off any liquid or fingerprints.

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

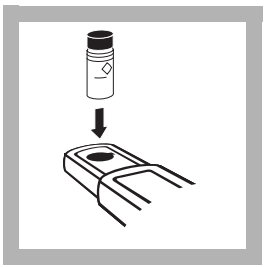
Note: *Accuracy is not affected by undissolved powder.*

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



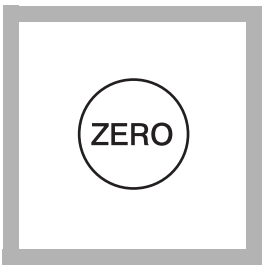
5. Remove the instrument cap.

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).

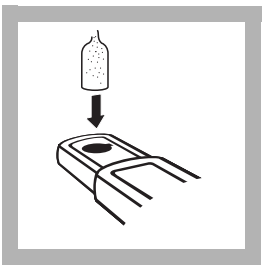
Note: *Wipe liquid off sample cells.*



7. Press: **ZERO**

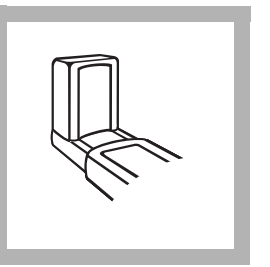
The instrument will turn on and the display will show **- - -** then **0.00**.

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

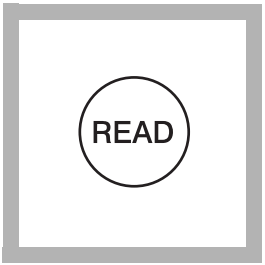


8. Within 3 minutes after the 3-minute reaction period, place the prepared sample in the cell holder.

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.

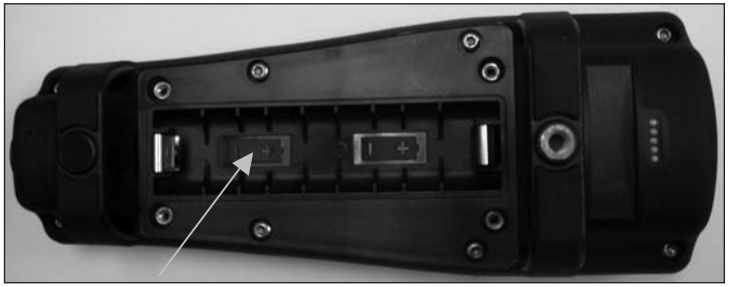


Figure 1. Pro30 with battery cover removed. Notice battery symbols indicating polarities.

> *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

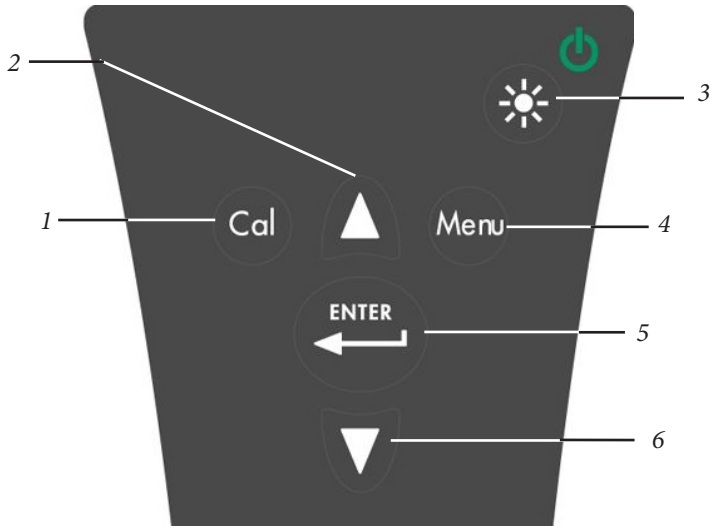


Figure 2, Keypad

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.

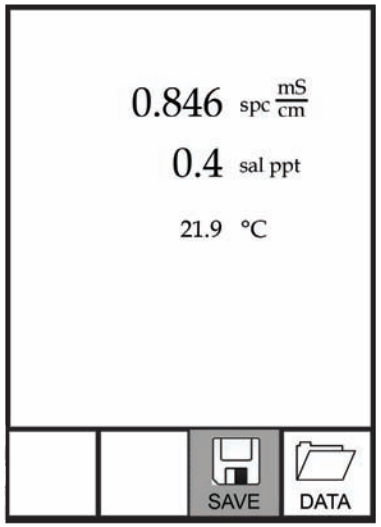


Figure 4, Run screen.

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.

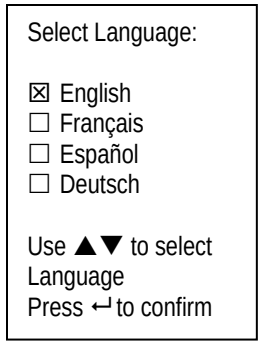


Figure 5, Select language.

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.

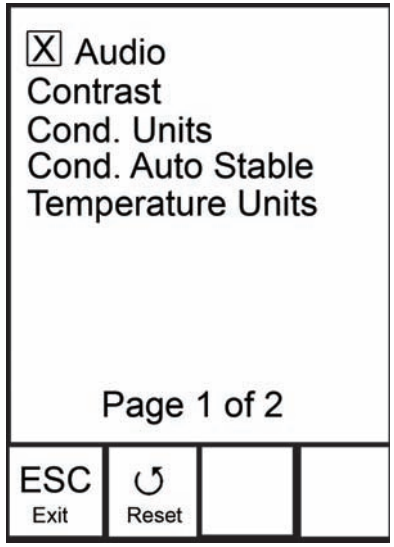


Figure 6, page 1 of System Setup menu. Audio is enabled.

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).

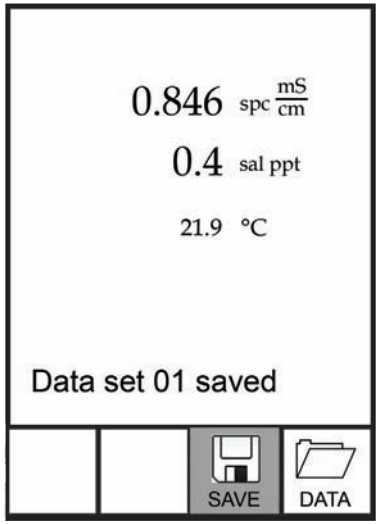


Figure 8, data set saved.

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).

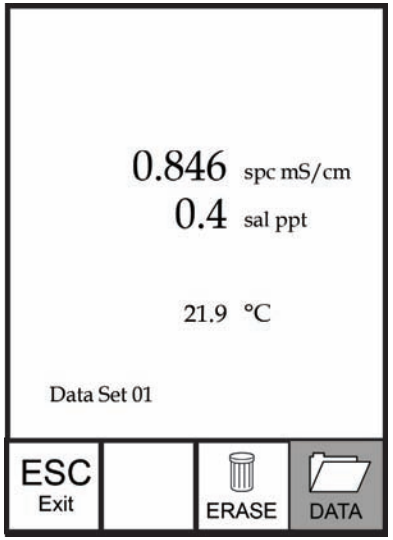


Figure 9, Data mode.

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

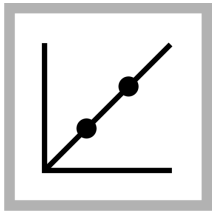
When placing an order please have the following available:
1.) YSI account number (if available)
2.) Name and phone number
3.) Purchase Order or Credit Card number
4.) Model Number or brief description
5.) Billing and shipping addresses
6.) Quantity

SERVICE INFORMATION

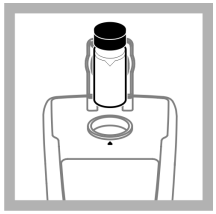
YSI has authorized service centers throughout the United States and Internationally. For the nearest service center information, please visit www.ysi.com and click 'Support' or contact YSI Technical Support directly at 800-897-4151 (+1 937-767-7241).

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".

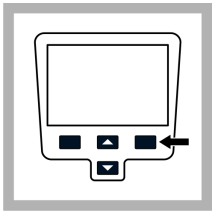
Item # 606082
Rev A
Drawing # A606082
July 2011



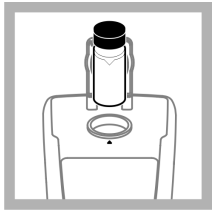
1. Push the **CALIBRATION** key to enter the Calibration mode. Follow the instructions on the display.
Note: *Gently invert each standard before inserting the standard.*



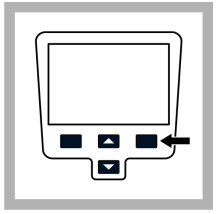
2. Insert the 20 NTU StablCal Standard and close the lid.
Note: *The standard to be inserted is bordered.*



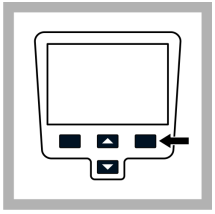
3. Push **Read**. The display shows Stabilizing and then shows the result.



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

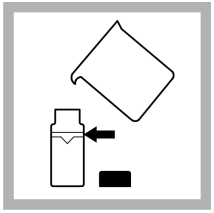
- Always cap the sample cell to prevent spillage of the sample into the instrument.
- Always use clean sample cells in good condition. Dirty, scratched or damaged cells can cause inaccurate readings.
- Make sure that cold samples do not “fog” the sample cell.
- Store sample cells filled with distilled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

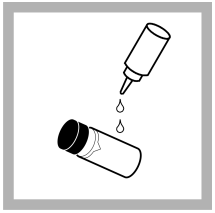
Turbidity measurement procedure

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.

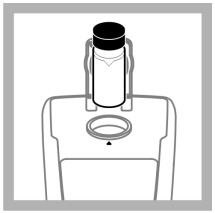
2. Wipe the cell with a soft, lint-free cloth to remove water spots and fingerprints.



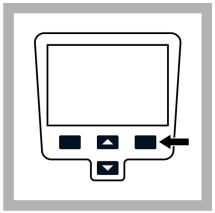
3. Apply a thin film of silicone oil. Wipe with a soft cloth to obtain an even film over the entire surface (Apply silicone oil to a sample cell on page 17).

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 F

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.

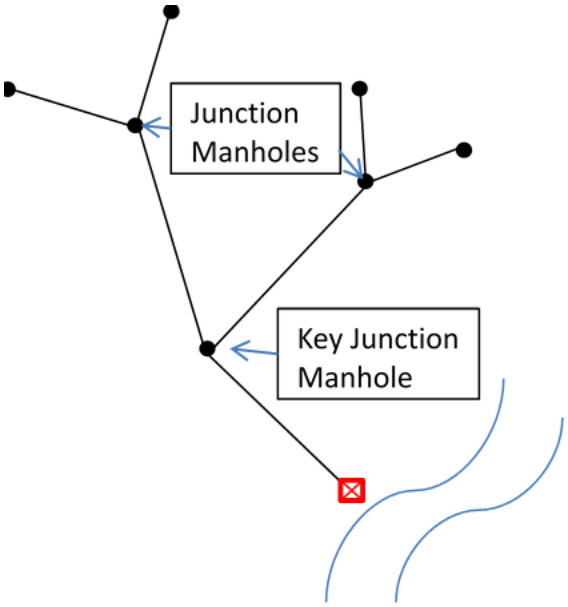

Figure 1 – Junction vs. Key Junction Manholes

- **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.

[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*

[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*

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

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

[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
Utility Knife	Multiple uses
Measuring Tape	Measuring distances and depth of flow
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Hand Sanitizer	Disinfectant/decontaminant
Machete/Clippers	Accessing overgrown infrastructure
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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)

A discrete manual or grab sample shall be collected for wet 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.[7]

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 3 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.

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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
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Enterococci [2]	≥ 130 cfu/100ml	Laboratory via approved method

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	≥ 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.

[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.

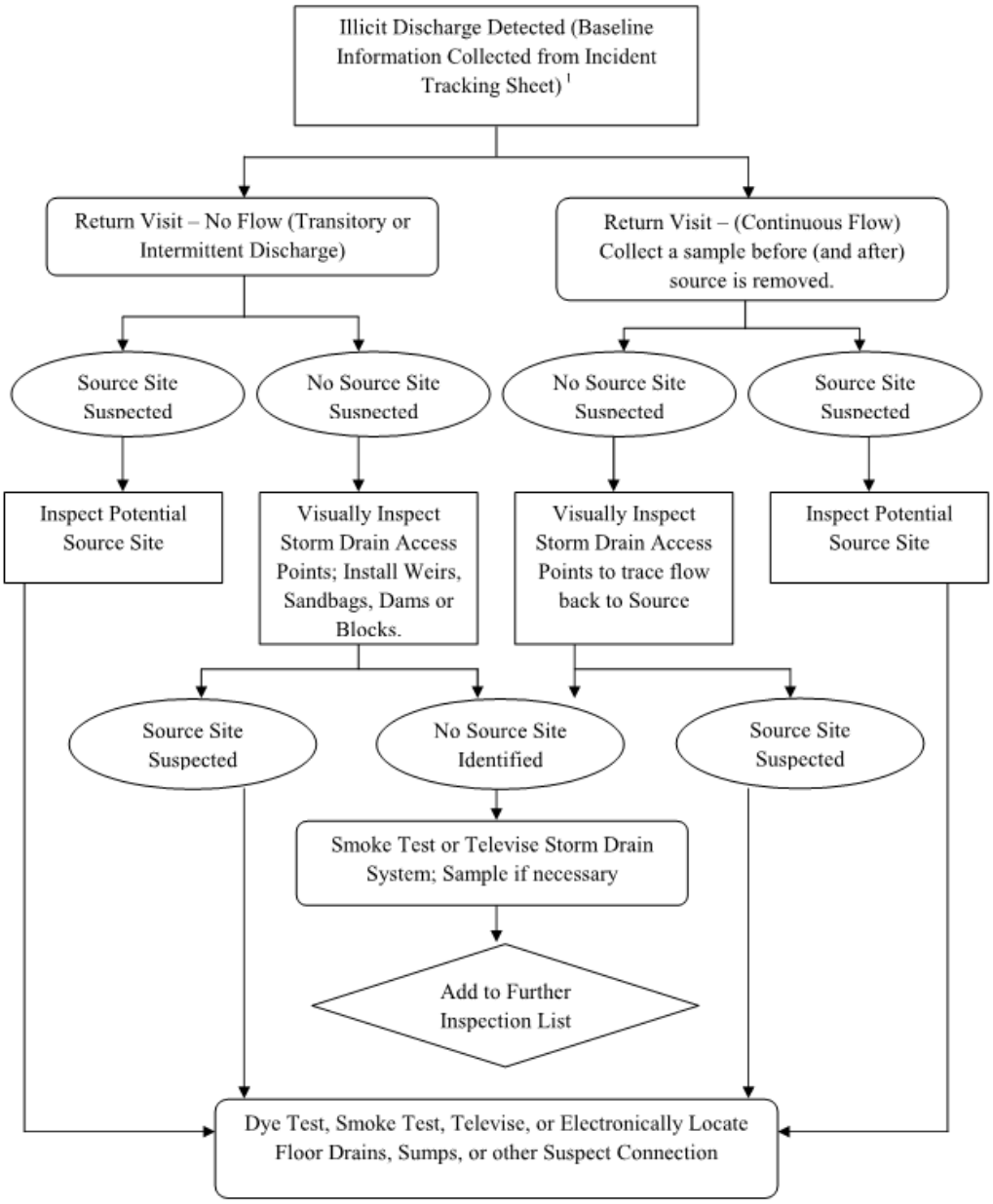

Figure 1 – Steps for Tracing Illicit Discharges

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.*

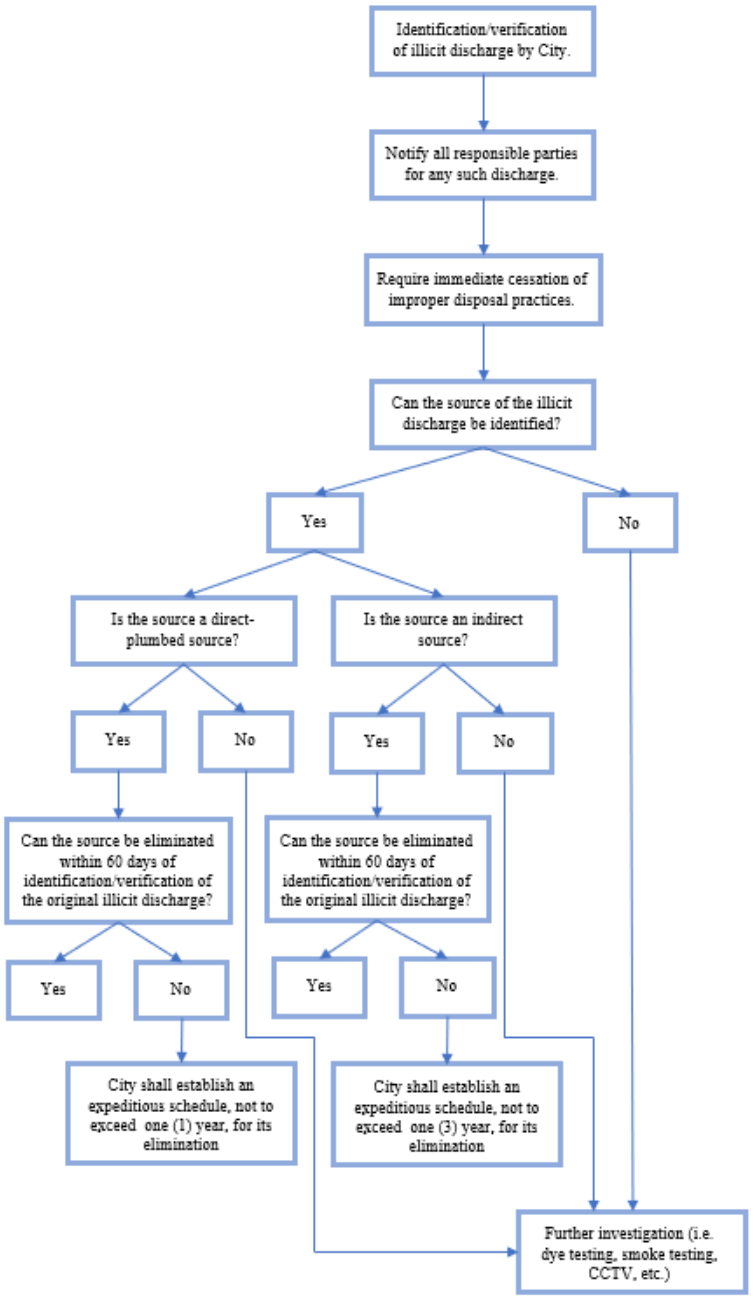

Figure 2 – Steps to Eliminate Illicit Discharge as per Consent Decree

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 E

IDDE TRAINING LOG

TRAINING ATTENDANCE SHEET

(Updated: 03/10/2025)

***COURSE TITLE :** Choose Training Title MS4 Stormwater Training

(VNA University Title)

INSTRUCTOR / PROCTOR NAME (TYPED): Scott Urban

MANAGER / SUPERVISOR AUTHORIZING EXTERNAL TRAINING VENDOR:

***REGULATED / UTILITY PROJECT/SITE LOCATIONS (CITY, STATE) Select from Dropdown:**

***CONTRACT OPERATIONS PROJECT/SITE LOCATIONS (CITY, STATE) Select from Dropdown:** HOLYOKE, MA

LOCAL EHS MANAGER/SPECIALIST FOR PROJECT/SITE: Vanessa Caron

***START TIME (NOT MILITARY): 07:30** AM ***FINISH TIME (NOT MILITARY): 08:30** AM

***DATE (MM/DD/YYYY): 05/01/2025**

Date Submitted:

* Required Field

*EMPLOYEE SIGNATURE (REQUIRED)	*PRINTED NAME (MUST BE TYPED)	*VEOLIA EMAIL ADDRESS (MUST BE TYPED ALL CAPS)	*PLACE AN "X" IN THIS COLUMN TO INDICATE EMPLOYEE ATTENDED TRAINING
	Jason Swain	JASON.SWAIN@VEOLIA.COM	X
	Scott Urban	SCOTT.URBAN@VEOLIA.COM	X
	Kevin Lukasiewicz	KEVIN.LUKASIEWICZ@VEOLIA.COM	X
	Rolanda Joseph	ROLANDA.JOSEPH@VEOLIA.COM	X
	Bernard Smyth	BERNARD.SMYTH@VEOLIA.COM	X
	Tony Orefice	TONY.OREFICE@VEOLIA.COM	X
	Jesse Danek	JESSE.DANEK@VEOLIA.COM	
	Ozzie Pedrosa	OSWALDO.PEDROSA@VEOLIA.COM	X
	Tyler Schofield	TYLER.SCHOFIELD@VEOLIA.COM	X
	Heri Cabrera	HERI.CABRERA@VEOLIA.COM	X
	Chris Pedrosa	CHRISTOPHER.PEDROSA@VEOLIA.COM	X

Date Submitted:

* Required Field

*EMPLOYEE SIGNATURE (REQUIRED)	*PRINTED NAME (MUST BE TYPED)	*VEOLIA EMAIL ADDRESS (MUST BE TYPED ALL CAPS)	*PLACE AN "X" IN THIS COLUMN TO INDICATE EMPLOYEE ATTENDED TRAINING
Scott Hebert	Scott Hebert	SCOTT.HEBERT@VEOLIA.COM	X
Shane Slowik	Shane Slowik	SHANE.SLOWIK@VEOLIA.COM	X
Kyle Schultzki	Kyle Schultzki	KYLE.SCHULTZKI@VEOLIA.COM	X
Jose Pomales	Jose Pomales	JOSE.POMALES@VEOLIA.COM	X
J. Perez	Joe Perez	JOSEPH.PEREZ@VEOLIA.COM	X

EHS - Training Attendance Sheet (Revised 02/2025)

Date Submitted:

* Required Field