City of Middletown

Connecticut

Stormwater Management Plan

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This plan is based on a template originally created by
Western Connecticut Council of Governments staff and modified for statewide
use by staff from UConn Center for Land use Education and Research (CLEAR).

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Introduction

This Stormwater Management Plan (SMP) was developed by the City of Middletown Town to protect water quality and reduce the discharge of pollutants from the municipality's storm sewer system to the maximum extent practicable (MEP). This SMP addresses the requirements established by the CT Department of Energy and Environmental Protection's (DEEP) General Permit for the Discharge of Stormwater from Small Municipal Separate Storm Sewer Systems (MS4 General Permit) which is included in Appendix A. This permit is the local enforcement mechanism of the U.S. Environmental Protection Agency's (EPA) National Pollutant Discharge Elimination System (NPDES) Stormwater Phase II Rule. Middletown's Registration for the MS4 General Permit is included in Appendix B.

SMP Structure

The plan outlines a program of best management practices (BMPs), measurable goals, responsible individuals or departments, and implementation schedules for the following six minimum control measures:

(1) Public education and outreach
(2) Public involvement and participation
(3) Illicit discharge detection and elimination
(4) Construction site stormwater runoff control
(5) Post-construction stormwater management in new development and redevelopment
(6) Pollution prevention/good housekeeping

Area Subject to the Plan

The measures identified in this SMP will be applied throughout the boundaries of the City of Middletown except as otherwise noted and be consistent with the MS4 General Permit requirements. Stormwater discharge from municipally-owned maintenance garages, salt sheds and other facilities subject to the DEEP Industrial Stormwater General Permit will continue to be regulated under the conditions of that permit.

SMP Development

A stormwater committee led by the Public Works Department and including representatives from planning, parks and recreation, economic development, inland wetlands and watercourses agency, and zoning enforcement was assembled to coordinate the development and implementation of the SMP.

The SMP's implementation will be tracked and documented in Annual Reports summarizing stormwater management activities carried out by the town and its partners. These reports will be submitted to DEEP on an annual basis no later than April 1.

Description of Municipality

The operator of the MS4 is the City of Middletown. Middletown is a public entity located in the county of Middlesex, State of Connecticut. The City of Middletown covers an area of approximately 42.44 square miles, located in Central Connecticut as shown on the USGS Quadrangle Map in Appendix C.

The Connecticut Department of Transportation (DOT) operates an MS4 on state highways located in the City. This system is regulated under the CT DOT's MS4 permit. These include State Highway Routes 3, 66 and 217. The City of Berlin also has an MS4 section in Middletown. Implementation of the BMPs identified in this plan will be coordinated between Middletown, CT DOT and the City of Berlin.

Impaired Waters

In preparing the SMP, the CT DEEP's Water Quality Standards were reviewed in order to determine the Surface Water Quality Classifications for each watercourse in Middletown. Certain BMPs address the watersheds containing watercourses designated as "impaired" by the CT DEEP. Table 1 shows the water quality classification for each watershed. Table 2 summarizes the water bodies within or that run through the municipality that are listed on the most updated List of Connecticut Water Bodies not meeting water quality standards and are designated as "impaired" (Ms. Karen Allen, DEEP Water Permitting and Enforcement

Division, stated the 2011 table is the most up-to-date as of March 2017). The Impaired Waters Table is presented in Appendix D, and the Surface Water Quality Classifications map is presented in Appendix E.

No increased discharges to impaired waters listed in categories 5 or 4b of the most recent Connecticut Integrated Water Quality Report (Appendix F) are permitted unless Middletown demonstrates there will be no net increase in loading of E. coli (E. coli is the only pollutant of concern for any of the impaired waters in Middletown).

TABLE 1
Water Quality Surface Classifications in Middletown, CT

Drainage Basin Number	Name	Surface Water Quality Classification	Impaired per Water Quality Standards
4000	Connecticut River	SB	Yes
4600	Mattabesset River	B	Yes
4604	Sawmill Brook	A	Yes
4607	Coginchaug River	B	Yes
4013	Sumner Brook	B	Yes

TABLE 2
Impaired Waterbodies in Middletown, CT

Waterbody ID and Water Segment Description	Length (miles)	Impaired Use	Pollutant	Cause/Potential Sources[1]
Connecticut River, 4000 – SB Classified				
Connecticut River-01: From head of estuary at Chapman Pond outlet, East Haddam, US to northern most boundary of Hurd State Park, East Hampton. Discharges from the Middletown MS4 to this section will be minimal, if any.	10.27	Recreation Fish Consumption	Escherichia coli Polychlorinated biphenyls	Stormwater, illicit discharges, agricultural runoff, wildlife/pets Industrial discharges, hazardous waste sites, oil and chemical spills
Connecticut River-02: From northern most boundary of Hurd State Park, East Hampton, US to confluence with Reservoir Brook (adjacent to Gildersleeve Island), Portland. There is no TMDL established for this section.	10.49	Recreation Fish Consumption	Escherichia coli Polychlorinated biphenyls	Stormwater, illicit discharges, agricultural runoff, wildlife/pets Industrial discharges, hazardous waste sites, oil and chemical spills
Mattabesset River Regional Basin, 4600 – B Classified				
Mattabesset River-01: From mouth at CT River, Cromwell, US to Route 3 crossing (south of Route 372 intersection).	3.31	Recreation Habitat for Fish, Other Aquatic Life and Wildlife	Escherichia coli Unknown	Stormwater, illicit discharges, agricultural runoff, wildlife/pets No specific notes in CT Impaired Waters List
Mattabesset River-02: From Route 3 crossing, Cromwell and Middletown Townline, US to High Pond Dam (just US of Berlin Street crossing), East Berlin.	3.65	Recreation Habitat for Fish, Other Aquatic Life and Wildlife	Escherichia coli Unknown	Stormwater, illicit discharges, agricultural runoff, wildlife/pets Potentially industrial point source discharge, landfills, illicit discharge, remediation sites, groundwater contamination

TABLE 2 (cont.)				
Waterbody ID and Water Segment Description	Length (miles)	Impaired Use	Pollutant	Cause/Potential Sources[1]
Mattabesset River-03: From High Pond Dam just US of Berlin Street crossing, East Berlin, US to confluence with Willow Brook.	3.6	Recreation Habitat for Fish, Other Aquatic Life and Wildlife	Escherichia coli Unknown	Stormwater, illicit discharges, agricultural runoff, wildlife/pets Potentially industrial point source discharge, landfills, illicit discharge
Mattabesset River-04: From confluence with Willow Brook, US to Kensington Dam at outlet of Railroad Pond (just US of Kensington Road crossing), Berlin.	2.83	Recreation Habitat for Fish, Other Aquatic Life and Wildlife	Escherichia coli Unknown	Stormwater, illicit discharges, agricultural runoff, wildlife/pets Potentially industrial point source discharge, landfills, illicit discharge, remediation sites, groundwater contamination
Mattabesset River-05: From Kensington Dam at outlet of Railroad Pond (just US of Kensington Road crossing), Berlin, US to inlet of Paper Goods Pond (segment includes both ponds).	1.01	Habitat for Fish, Other Aquatic Life and Wildlife	Unknown	No specific notes in CT Impaired Waters List
Mattabesset River-06: From inlet to Paper Goods Pond, US to Lower Hart Pond outlet dam (Both Lower and Upper Hart Ponds are not in segment).	1.32	Recreation Habitat for Fish, Other Aquatic Life and Wildlife	Escherichia coli Unknown	Stormwater, illicit discharges, agricultural runoff, wildlife/pets No specific notes in CT Impaired Waters List
Spruce Brook-13 (Berlin): From mouth at Mattabasset River US to headwaters at confluence of East/West Spruce Brooks, above Lamentation Brook (Lamentation Mountain area).	4.17	Recreation	Escherichia coli	Stormwater, illicit discharges, agricultural runoff, wildlife/pets
Miner Brook-26: From mouth at confluence with Mattabasset River, Cromwell/ Middletown border, US to headwaters (in marsh just US (south) of Westfield Street crossing, parallel with Route 217), Middletown.	2.92	Recreation	Escherichia coli	Stormwater, illicit discharges, agricultural runoff, wildlife/pets
Sawmill Brook Watershed, 4604 A Classified				
Sawmill Brook-00 (includes Smiths Pond): From mouth at Mattabasset River, US to headwater above Atkin Street Pond (Highland Pond) Middletown.	4.18	Recreation	Escherichia coli	Stormwater, illicit discharges, agricultural runoff, wildlife/pets

TABLE 2 (cont.)				
Waterbody ID and Water Segment Description	Length (miles)	Impaired Use	Pollutant	Cause/Potential Sources[1]
Coginchaug River Watershed, 4607 B Classified				
Coginchaug River-02: From downstream side of Route 3 crossing, US to downstream side of Route 66 crossing (just US of Veterans Memorial Park), Middletown.	0.75	Recreation	Escherichia coli	Stormwater, illicit discharges, agricultural runoff, wildlife/pets
Coginchaug River-03: From downstream side of Route 66 crossing (just US of Veterans Memorial Park), US to Starr Mill Pond dam, Middletown.	0.6	Recreation	Escherichia coli	Stormwater, illicit discharges, agricultural runoff, wildlife/pets
Coginchaug River-04: From Starr Mill Pond Inlet, Middletown, US (past Wadsworth Falls) to Strictland Road crossing, Middlefield.	4.19	Recreation	Escherichia coli	Stormwater, illicit discharges, agricultural runoff, wildlife/pets
Coginchaug River / Laurel Brook-13: Mouth on Coginchaug River, in Wadsworth Falls State Park, parallel to swimming area, near Route 157, US to unnamed pond outlet, just US of Red Road crossing, Middletown.	1.17	Recreation	Escherichia coli	Stormwater, illicit discharges, agricultural runoff, wildlife/pets
Wadsworth Falls SP Pond-00-UL_pond_01 (Middlefield): Small pond within Wadsworth Falls State Park (filled and drained with connection to Coginchaug River), on Route 157 between confluence of Laurel Brook to Coginchaug River and Wadsworth Brook confluence with Coginchaug River, Middletown.	1.37 Acres	Recreation	Escherichia coli	Stormwater, illicit discharges, agricultural runoff, wildlife/pets
Sumner Brook Watershed, 4013 B Classified				
Sumner Brook-00: Confluence with Long Hill Brook, parallel with Mill Street, US to Russells Pond OUTLET, DS of Russell Street crossing, Middletown.	0.52	Habitat for Fish, Other Aquatic Life and Wildlife	Unknown	Unknown Potentially remediation sites, groundwater contamination, industrial wastewater, spills, unspecified urban stormwater.
Crystal Lake-05-1-L1_01: South of Randolph Road, Middletown.	30.96 Acres	Recreation	Escherichia coli	Stormwater, illicit discharges, agricultural runoff, wildlife/pets

Note 1) Information obtained from Table 3-3 Summary of Designated Uses with Common Stressors, 2014 State of CT Integrated Water Quality Report. Where "Habitat for Fish, Other Aquatic Life and Wildlife" is the impaired use, the common stressors are habitat alterations, flow regime changes, toxics, nutrients, interactions between multiple pollutants, low dissolved oxygen. Common sources of these stressors are industrial discharges, municipal wastewater treatment discharges, hazardous waste sites, oil and chemical spills, land use and stormwater.

The surface water classifications currently assigned to Middletown watercourses are defined below.

Class A

Surface water is known or presumed to meet Water Quality Criteria which support designated uses, which may include potential drinking water supply; fish and wildlife habitat; recreational use; agricultural, industrial supply and other legitimate uses, including navigation. The targets for water quality where Escherichia coli is a stormwater pollutant of concern are as follows for Class A waters:

- Instantaneous designated swimming 235 cols/100mls
- Non designated swimming 410 cols/100mls
- All other recreation 576 cols/100mls
- Geomean 126 cols/100mls

Class B

These surface waters are designated for habitat for fish and other aquatic life and wildlife; recreation; navigation; and industrial and agricultural water supply. The targets for water quality where Escherichia coli is a stormwater pollutant of concern are the same as Class A listed above.

Class SB

These waters are designated for habitat for marine fish, other aquatic life and wildlife; commercial shellfish harvesting; recreation; industrial water supply; and navigation. The targets for water quality where bacteria is a stormwater pollutant of concern are as follows for Class SB waters:

- Instantaneous designated swimming 104 cols/100mls
- Instantaneous all other uses 500 cols/100mls
- Geomean 35 cols/100mls

The CT River is classified as SB for water quality which is a marine classification. The general permit requires testing for Fecal coliform and Enterococci for SB surface waters, yet the impaired waters table indicates the cause of the impairment in the Middletown sections of the CT River is Escherichia coli. Ms. Karen Allen, DEEP Water Permitting and Enforcement Division, and staff in the Water Planning and Standards Division clarified that the required parameter for the Middletown area of the CT River is Escherichia coli.

Based on the DEEP Surface Water Quality Classifications and TMDL's established, the waterbodies listed in Table 2 (with the exception of the CT River[1]) are identified as the surface waters that should take the highest priority in Middletown's efforts to address stormwater impacts. These were taken into consideration as the BMPs were developed.

Note 1: There is no TMDL established for the Connecticut River CT4000-00_02, and discharges from the Middletown MS4 to section CT4000-00_01 are expected to be minimal, if any.

Protecting Natural Diversity and Endangered Species

Activities initiated by Middletown under this SMP will not negatively affect any endangered or threatened species or their essential habitats. The Natural Diversity Data Base map is included in this SMP (Appendix G) and will be reviewed, along with Section 26-306 of the Connecticut General Statutes, before any BMPs are implemented in these areas.

New or Increased Discharges to High Quality Waters

"High Quality Waters" are defined in RCSA Section 22a-426-1 as "surface waters where the water quality is better than necessary to meet the minimum criteria established in the Connecticut Water Quality Standards for the applicable classification and related designated uses." On or before 30 days prior to the commencement of a new or increased discharge to a High Quality Waters, Middletown will document compliance with the Connecticut Anti-Degradation Implementation Policy in the Water Quality Standards, as amended. For any such discharges, Middletown will identify in its SMP control measures to ensure compliance with these provisions and the general permit. Maximum Extent Practicable standards (defined in Section 5(b) of the general permit) will be evaluated and implemented as required.

Aquifer Protection Areas

Activities initiated by Middletown under this SMP will not negatively affect any aquifer protection areas identified in the map in Appendix H. The map will be reviewed, along with Section 22a-354i of the Connecticut General Statutes, before any BMPs are implemented in these areas. Appendix C of the General Permit will also be included in the review. Additionally, specific activities identified in Sections 8(c) and 9(b) of these regulations will be managed accordingly to protect groundwater quality.

Preservation of Historic Places

Activities initiated by Middletown under this SMP will not negatively affect or impact any historic places identified in Appendix I. State Historic Preservation statutes, regulations, and policies will be reviewed prior to any such activities, or an Army Corps of Engineers Section 404 wetland permit will be obtained.

(1) Public Education and Outreach

This minimum control measure outlines a program to communicate common sources of stormwater pollution and the impacts of polluted stormwater to the public. This will be done through distributing educational materials to the community and conducting outreach activities. The following BMPs and implementation schedule serve as Middletown's MS4 Public Education Program.

Goals:

- Raise public awareness that polluted stormwater runoff is the most significant source of water quality problems;
- Motivate residents to use Best Management Practices (BMPs) that reduce polluted stormwater runoff; and
- Reduce polluted stormwater runoff in town as a result of increased awareness and utilization of BMPs.

1.1 Implement public education program

Middletown will collect and distribute stormwater educational materials that, at a minimum, address the impacts of the following on water quality: pet waste, impervious cover, application of fertilizers, pesticides, and herbicides, and illicit discharges and improper disposal of wastes into the MS4.

Middletown will maintain their own or link to UConn NEMO's comprehensive online library of stormwater educational material. The Middletown website can be found at http://www.cityofmiddletown.com/content/117/121/167/default.aspx and will contain a link directly to this web-based library and promote the availability of these materials. Mr. Thomas Nigosanti and Ms. Kim O'Rourke will be responsible for developing educational materials. The City will also provide materials in a printed format to be on display in public locations within the Middletown town hall and Russell public library.

Additional targeted outreach efforts will be completed by the Department of Public Works to educate K-12 students, agricultural operators, commercial businesses, developers, and homeowners on particular aspects of stormwater management.

Middletown will coordinate with the Connecticut River Coastal Conservation District (CRCCD), MRWA, CRGC, Riverwatch, and Nature Conservancy to ensure that all required topics listed in this plan are covered and tracked on an annual basis. Kim O'Rourke, Recycling Coordinator, and Michelle Ford, Planning & Environmental Specialist, will be consulted in these efforts.

The CRCCD has developed the following publications which are available on their website at www.conservect.org/ctrivercoastal:

- The Backyard Water Resources Guide
- How to Create a Streamside Buffer Garden
- Pet Waste, Water Quality & Your Health
- Rain Recycling with Rain Barrels

Ms. Jane Brawerman, Executive Director at CRCCD, will continue to provide educational materials as they become available. The CRCCD office is located at deKoven House Community Center - 27 Washington Street, Middletown and is open to the public 8:30 am to 4:30 pm Monday through Friday.

1.2 Address education and outreach for pollutants of concern

Middletown will distribute information on common sources of bacteria and how to prevent or reduce the amount reaching the MS4 and discharging into waterways. There are no waters in Middletown for which nitrogen or phosphorus are pollutants of concern.

The following additional topics will covered to address the bacteria impairments that exist in Middletown.

- Septic systems
- Sanitary cross connections
- Waterfowl
- Pet waste
- Manure piles associated with livestock and horses

Public outreach and education schedule

BMP	Lead department / individual	Month / year of implementation	Measurable goal
Implement public education program	Kim O'Rourke, Recycling Coordinator	July 1, 2018 and continue until permit expires	1) Distribute educational brochures to various segments of the population; elementary schools, Russell Library, Wesleyan, Household Hazardous Waste Collection participants, public meetings and/or included with water bills. Topics will include pet waste, fertilizers, herbicides, and pesticides, impervious cover and impacts of illicit discharges and improper disposal of waste. 2) Create a link on the city website with pertinent information and a method for citizen reports on polluters.
Address education/outreach for pollutants of concern	Kim O'Rourke, Recycling Coordinator	July 1, 2018 and continue until permit expires	Educational materials will include pollutants of concern specific to Middletown waterbodies (bacteria) and some recommended BMPs to reduce the impacts.
Target education to specific properties known to contribute bacteria to stormwater	Kim O'Rourke, Recycling Coordinator	July 1, 2018 and continue until permit expires	Identify properties and owners based on historic sanitary system failures, proximity to bacteria impaired waters, low infiltrative soils, and shallow groundwater.

(2) Public Involvement and Participation

This minimum control measure identifies the process for public involvement and participation in the town's stormwater management efforts.

Goals:

- Involve the community in planning and implementing the town's stormwater management activities.
- Provide a minimum 30 day notice to the public for this plan and annual reports.

2.1 Comply with public notice requirements for the Stormwater Management Plan and Annual Reports

Middletown will publish a public notice on its website. The notice will provide a contact name, phone number, address, and email to whom the public can send comments. Additionally, this plan and the Annual Reports will be publicly accessible on the web at the following locations:

http://www.cityofmiddletown.com/content/117/121/167/default.aspx
http://www.middletownct.gov/filestorage/117/121/167/2016_MS4_Annual_Report.pdf
A copy of this SMP will also be available for public inspection and copying at the Middletown Town Hall.

The public notice will allow for a 30-day comment period, at a minimum.

Public involvement and participation schedule

BMP	Lead department / individual	Month / year of implementation	Measurable goal
Comply with public notice requirements for the SMP and Annual Reports	Thomas Nigosanti, City Engineer, DPW	July 1, 2017 and continue until permit expires	Complete by July 1, 2017
Stormwater Management Plan available for public review	Kim O'Rourke, Recycling Coordinator	April 1, 2017	Complete by April 1, 2017
Enlist local organizations to help implement the elements of the Plan	Michelle Ford, Planning & Environmental Specialist	Before June 30, 2018	Hold annual meetings with the Inland Wetlands Commission.
Enlist local organizations to help implement the elements of the Plan	Michelle Ford, Planning & Environmental Specialist	Before June 30, 2018	Coordinate public involvement with CRGC, MRWA, Riverwatch and Nature Conservancy.

(3) Illicit Discharge Detection and Elimination

This minimum control measure outlines a program to detect and eliminate current illicit discharges to the MS4 and prevent further illicit discharges in the future. All activities for this measure will be completed in Middletown's priority areas (urbanized area, catchment areas with directly connected impervious area (DCIA) > 11%, and outfalls that discharge to impaired waters).

Goal:

Find the source of any illicit discharges; eliminate those illicit discharges; and ensure ongoing screening and tracking to prevent and eliminate future illicit discharges.

3.1 Develop written IDDE plan

Middletown will develop a written IDDE plan to detect, locate and eliminate illicit discharges (to the maximum extent practicable) from the MS4 within Middletown's priority areas. The IDDE plan will provide enforceable legal authority to eliminate illicit discharges, assign responsibilities, and develop a citizen reporting program. The plan will also outline the outfall screening and IDDE protocols consistent with Appendix B of the MS4 General Permit to identify, prioritize, and investigate MS4

catchments for suspected illicit discharge of pollutants. Also, the IDDE plan will outline follow-up screening and illicit discharge prevention procedures.

3.2 Develop list and map of all MS4 outfalls and interconnections in priority areas

Middletown will complete a database of all stormwater discharges from a pipe or conduit located within and owned or operated by the municipality and all interconnections with other MS4s. Each entry will include:

a. Type, material, size, shape and location (identified with a latitude and longitude) of conveyance, outfall or channelized flow (e.g. 24" concrete pipe);
b. the name, water body ID and Surface Water Quality Classification of the immediate surface waterbody or wetland to which the stormwater runoff discharges;
c. if the outfall does not discharge directly to a named waterbody, the name and water body ID of the nearest named waterbody to which the outfall eventually discharges;
d. the name of the watershed, including the subregional drainage basin number (available from CT ECO at www.cteco.uconn.edu) in which the discharge is located;
e. date of most recent inspection of the outfall, the condition, and any indicators of potential non-stormwater discharges as of most recent inspection;

As data is collected, it will be given to Thomas Nigosanti, City Engineer, who will enter it or import it into existing GIS files. Furthermore, Mr. Nigosanti will be responsible for maintaining and updating maps and spreadsheets as needed, at a minimum of monthly. The database will be exported into excel format for annual reports.

3.3 Develop citizen reporting program

Middletown will establish a system to allow for citizen reporting of suspected illicit discharges into the stormwater system. The system will include an email address and phone number for submitting a report. Middletown will affirmatively investigate and eliminate any illicit discharges for which a time and location of discharge are provided. Middletown will promptly inspect the reported outfall or manhole and proceed according to the requirements of the written IDDE program. All citizen reports and responses will be included in Middletown's annual report.

3.4 Establish legal authority to prohibit illicit discharges

Middletown will update the necessary and enforceable legal authority by statute, ordinance, rules and regulations, permit, easement, contract, order or any other means, to eliminate illicit discharges. The authority will:

a. prohibit illicit discharges to its storm sewer system and require removal of such discharges consistent with the deadlines outlined in the MS4 general; and
b. authorize the investigation of suspected illicit discharges and elimination of illicit discharge, including from properties not owned or controlled by the MS4 that discharge to the MS4
c. control the discharge of spills and prohibit the dumping or disposal of materials including, but not limited to, residential, industrial and commercial wastes, trash, used motor vehicle fluids, pesticides, fertilizers, food preparation waste, leaf litter, grass clippings, and animal wastes into its MS4; and
d. authorize appropriate enforcement procedures and actions;
e. authorize fines or penalties and/or recoup costs incurred by the permittee from anyone creating an illicit discharge or spilling or dumping.

The ordinance can be found at:
http://ecode360.com/27362076?highlight=discharging,discharged,discharger,discharges,discharge,illegal#27362076

3.5 Develop record keeping system for IDDE tracking

Middletown will keep a record of illicit discharge abatement activities including location (including latitude and longitude or address), description, date(s) of inspection, sampling data (if applicable), action(s) taken, date of removal or repair and responsible party.

In addition, Middletown will develop and maintain a sanitary sewer overflow (SSO) inventory that records the location, date and time of occurrence, estimated volume of discharge, a description of known or suspected cause, and details about mitigating measures including dates of implementation.

This inventory will also:

- include all known SSOs to their MS4 in the past 5 years (July 1, 2012 – June 30, 2017);
- continue to be updated to track future SSOs; and
- be included in Annual Reports.

3.6 Address IDDE in areas with pollutants of concern

Middletown will identify which areas in town are most likely to contribute bacteria to the MS4. This assessment will consider: historic on-site sanitary system failures, proximity to bacterial impaired waters, low infiltrative soils, and shallow groundwater. Any areas determined to have a high potential for septic system failure will be reported to the Health Department for corrective action.

3.7 Detailed MS4 infrastructure mapping

Middletown will revise its detailed map of the MS4 to include:

- Components of the MS4 within priority areas:
    - Outfalls & receiving waters;
    - Pipes; open channel conveyances; catch basins; manholes;
    - Interconnections with other MS4s and other storm sewer systems;
    - Municipally-owned stormwater treatment structures (e.g. detention & retention ponds, infiltration systems, bioretention areas, water quality swales, gross particle separators, oil/water separators, or other systems);
    - Catchment delineations for each outfall;
    - Impaired water bodies identified by name and use impairment as defined by the most recent integrated water quality report;
    - Municipal sanitary sewer system (if available);
    - Municipal combined sewer system (if applicable).

Middletown will update the map as new information becomes available and will report on the progress of the development of this map in the annual report.

Illicit discharge detection and elimination schedule

BMP	Lead department / individual	Month / year of implementation	Measurable goal
Develop written IDDE program	Thomas Nigosanti, City Engineer, DPW	July 1, 2018	Complete written program by date specified addressing all required elements.
Develop list and maps of all MS4 stormwater outfalls in priority areas	Thomas Nigosanti, City Engineer, DPW	July 1, 2019	The list and maps will include all MS4 stormwater outfalls in priority areas. Complete by June 30, 2022.
Develop citizen reporting program	Kim O'Rourke, Recycling Coordinator	July 1, 2018	Develop a method for citizen reporting. Conduct an inspection within a specified time and complete a report with follow up date as is necessary.
Establish legal authority to prohibit illicit discharges	William Russo, Director of Public Works	July 1, 2018	Update as necessary to comply with permit.

BMP	Lead department / individual	Month / year of implementation	Measurable goal
Develop record keeping system for IDDE tracking	Thomas Nigosanti, City Engineer, DPW	July 1, 2017	Develop tracking table. A rating system will be implemented to prioritize and track the progress.
Address IDDE in areas with pollutants of concern	Robert DeManche, Inspector	July 1, 2017	1) Identify IDDE areas with the highest potential to discharge bacteria to the MS4. Potential will be based on criteria specified in the permit. 2) Develop an initial illicit discharge potential assessment and priority ranking system.
Detailed MS4 infrastructure mapping	Thomas Nigosanti, City Engineer, DPW	July 1, 2020	All required mapping elements will be included as required in Appendix B in the permit.
Complete list and maps of all MS4 stormwater outfalls throughout municipality	Thomas Nigosanti, City Engineer, DPW And United International Corporation	July 1, 2022	The existing GIS map will be overlaid with the entire storm sewer network. The goal is to have the entire stormwater network as an interactive layer on the city's GIS.

(4) Construction Site Stormwater Runoff Control

This minimum control measure outlines procedures for minimizing polluted stormwater runoff from activities that disturb one or more acres of land. In Middletown, this is determined on a site by site basis or collectively as part of a larger plan.

Goal:

Minimize polluted stormwater runoff from construction sites and prevent it from carrying sediment into waterways via MS4 infrastructure.

4.1 Implement, upgrade and enforce land use regulations or ordinances to meet requirements of MS4 general permit

Middletown will revise its land use regulations or ordinances to establish the legal authority to control stormwater runoff from construction sites by requiring:

a. developers, construction site operators, or contractors maintain consistency with the 2002 Guidelines for Soil Erosion and Sedimentation Control, as amended, the Connecticut Stormwater Quality Manual, and all stormwater discharge permits issued by the DEEP within the municipal or institutional boundary pursuant to CGS 22a-430 and 22a-430b;
b. the implementation of additional measures to protect/improve water quality (in addition to the above requirements) as deemed necessary by Middletown;
c. Middletown is authorized to carry out all inspection, surveillance and monitoring procedures necessary to determine compliance with municipal regulations, ordinances or programs or institutional requirements related to the management of Middletown's MS4. Inspections shall be conducted, where allowed, to inventory the number of privately-owned retention ponds, detention ponds and other stormwater basins that discharge to or receive drainage from the permittee's MS4;
d. the owner of a site seeking development approval from Middletown shall provide and comply with a long term maintenance plan and schedule to ensure the performance and pollutant removal efficiency of privately-owned retention ponds, detention ponds and other stormwater basins that discharge to or receive discharge from Middletown's MS4 including short-term and long-term inspection and maintenance measures to be implemented by the private owner; and
e. Middletown will control, through interagency or inter-jurisdictional agreements, the contribution of pollutants between the permittee's MS4 and MS4s owned or operated by others.

4.2 Develop and implement plan for interdepartmental coordination of site plan review and approval

Middletown's plan to coordinate the functions of all the departments and boards involved in the review, permitting, or approval of land disturbance projects is as follows:

Ordinance / Regulatory Mechanism

The Director of Planning, Conservation & Development will update the subdivision regulations to provide the ability to regulate the discharge of runoff from construction sites. The possibility of a separate bond for erosion control will be discussed which should be able to be called on short notice in order to react to weather related problems. For construction projects greater than one acre, the General Permit for the Discharge of Stormwater and Dewatering Wastewater Associated with Construction Activities will be required to be on file prior to commencement of construction. Procedures for enforcement of control measures are to be set.

Site Plan Review

All site plans will be reviewed by the Planning, Conservation & Development Department and the Public Works Engineering Division for sedimentation and erosion controls. Site plan reviews will consider stormwater controls or management practices to prevent or minimize impacts to water quality.

Construction Inspection Program

Random inspections of construction sites will be performed by the Environmental Planner and/or the Wetlands Enforcement Officer to determine the overall compliance that is being achieved by construction operators. Road construction projects will have regular inspections to verify compliance with plans. New subdivisions will have either 3rd party inspections, or be inspected by Public Works personnel.

Procedures and legal authority are in place to conduct site inspections and enforcement to assess the adequacy of the installation, maintenance, operation, and repair of construction and post construction control measures. Progress reports will be prepared by the developer and/or the Zoning Enforcement Officer. A checklist of issues and prioritizing rating system will be implemented as a measuring tool. The goal is to continually improve the program.

4.3 Review site plans for stormwater quality concerns

Middletown will conduct site plan reviews that incorporate consideration of stormwater controls or management practices to prevent or minimize impacts to water quality on sites with soil disturbance of one acre or more. Middletown will also conduct site inspections to assess the adequacy of the installation, maintenance, operation, and repair of construction and post construction control measures and take enforcement action when necessary.

4.4 Conduct site inspections

Middletown will perform construction site inspections and take enforcement actions if necessary to ensure the adequacy of the installation, maintenance, operation, and repair of all construction and post-construction runoff control measures.

4.5 Implement procedure to allow public comment on site development

Middletown's procedure for public involvement in proposed and ongoing development and land disturbance activities is as follows:

Site development projects will be announced on the city website with a link for public comment. The public involvement procedure includes receipt and consideration of input submitted through the link. Information related to construction site runoff will be forwarded to Thomas Nigosanti, the City Engineer, who will meet with Michelle Ford, Planning & Environmental Specialist for review and discussion. A generic response will be sent immediately to the submitter acknowledging their comment, and a specific response will be sent within a month after the initial comment describing if and how the comment will be considered in the project.

4.6 Implement procedure to notify developers about DEEP construction stormwater permit

Middletown will notify developers and contractors of their potential obligation to obtain authorization under DEEP's General Permit for the Discharge of Stormwater and Dewatering Wastewaters Associated with Construction Activities (construction general permit) if their project disturbs more than 1 acre of land and results in a point source discharge to Connecticut surface waters directly or through the Middletown MS4. Middletown will also require a copy of the Storm Water Pollution Control Plan be made available to the town on request. The procedure to notify developers of the construction general permit is as follows:

Middletown will inform developers working with the municipality that they have a *potential obligation* to obtain authorization under the DEEP's General Permit for the Discharge of Stormwater and Dewatering Wastewaters Associated with Construction Activities ("construction general permit") if their development or redevelopment project *disturbs one or more acres of land*, either individually or collectively, as part of a larger common plan, *and results in a point source discharge to the surface waters of the state directly or through the permittee's MS4*. The notification will include a provision informing the developer/ contractor of their obligation to provide a copy of the Storm Water Pollution Control Plan (required by the construction general permit) to the permittee upon request.

The contractor is required at all times to conduct his/her operations in conformity with all Federal and State permit requirements concerning water, air, noise pollution and the disposal of contaminated, or hazardous materials.

Construction site stormwater management schedule

BMP	Lead department / individual	Month / year of implementation	Measurable goal
Implement, upgrade and enforce land use regs or ordinances to meet MS4 permit requirements	Director of Planning, Conservation & Development	July 1, 2019	Compare current language in regs to permit requirements and amend as necessary.
Develop/implement plan for interdepartmental coordination in site plan review and approval	Director of Planning, Conservation & Development	July 1, 2017 (Completed in 2011)	Site plans are reviewed by the Planning, Conservation & Development Department and the Public Works Engineering Division for sedimentation and erosion controls.
Review site plans for stormwater quality concerns	Director of Planning, Conservation & Development	July 1, 2017	Develop a procedure to conduct site plan reviews that incorporate consideration of stormwater controls or management practices to prevent or minimize impacts to water quality.
Conduct site inspections	Director of Planning, Conservation & Development and/or Inland Wetlands Enforcement Officer and Third Party Inspectors	July 1, 2017	Procedures and legal authority are already in place to conduct site inspections and enforcement to assess the adequacy of the installation, maintenance, operation, and repair of construction and post construction control measures. Progress reports will be prepared by the developer and/or the Zoning Enforcement Officer. A checklist of issues and prioritizing rating system will be implemented as a measuring tool. Goal is to make continual improvements and eliminate issues.
Implement procedure to allow public comment on site development	Director of Planning, Conservation & Development	July 1, 2017	Develop a procedure for receipt and consideration of information submitted by the public concerning proposed and ongoing land disturbance and development activities. See section 4.5 above.
Implement procedure to notify developers about DEEP construction stormwater permit	Director of Planning, Conservation & Development	July 1, 2017	Develop a procedure to notify developers of their *potential obligation* to obtain a "construction general permit" from DEEP. See section 4.6 above.

(5) Post-construction Stormwater Management in New Development or Redevelopment

This minimum control measure outlines Middletown's program to address stormwater runoff from new or re-development projects that disturb one or more acres of land.

Goal:

Mitigate the long-term impacts of new and re-development projects on water quality through proper use of low impact development and runoff reduction practices.

5.1 Establish or update legal authority and guidelines regarding LID and runoff reduction in site development planning

Middletown will update their legal authority by ordinance, bylaw, regulation, standard condition of approval, or other means to require, to the MEP, developers and contractors seeking the town's approval to consider the use of low impact development (LID) and runoff reduction site planning and development practices that meet or exceed those LID and runoff reduction practices in the CT Stormwater Quality Manual prior to other stormwater management practices allowed in Middletown's land use regulations, guidance or construction project requirements.

This legal authority will include the following standards:

1) for redevelopment of sites that are currently developed with Directly Connected Impervious Area (DCIA) of forty percent or more, the project must retain on-site half the water quality volume for the site, or
2) for new development and redevelopment of sites with less than forty percent DCIA, retain the water quality volume for the site, or
3) if those retention standards cannot be met, the developer will be required to provide a report indicating why the standard could not be met and a mitigation project on another property or pay a fee to fund a DCIA retrofit.

In developing this legal authority, Middletown will consider the following watershed protection elements to manage the impacts of stormwater on receiving waters:

a. Minimize the amount of impervious surfaces (roads, parking lots, roofs, etc.) within each municipality by minimizing the creation, extension, and widening of parking lots, roads, and associated development and encourage the use of Low Impact Development or green infrastructure practices.
b. Preserve, protect, create and restore ecologically sensitive areas that provide water quality benefits and serve critical watershed functions. These areas may include, but are not limited to; riparian corridors, headwaters, floodplains and wetlands.
c. Implement stormwater management practices that prevent or reduce thermal impacts to streams, including requiring vegetated buffers along waterways, and disconnecting discharges to surface waters from impervious surfaces such as parking lots.
d. Seek to avoid or prevent hydromodification of streams and other water bodies caused by development, including roads, highways, and bridges.
e. Implement standards to protect trees, and other vegetation with important evapotranspirative qualities.
f. Implement policies to protect native soils, prevent topsoil stripping, and prevent compaction of soils.
g. Coordinate with state or local health officials to ensure no interference with performance of on-site septic systems.
h. Limit turf areas.

In addition, Middletown will review its current regulations - site planning requirements, zoning regulations, street design regulations, and infrastructure specifications with minimum size criteria for impervious cover (roads, parking lots, etc.) to identify and, where appropriate, reduce or eliminate existing regulatory barriers to implementation of LID and runoff reduction practices to the MEP.

5.2 Implement long-term maintenance plan for stormwater basins and treatment structures

Middletown will develop a maintenance plan for retention / detention ponds and stormwater treatment structures that it owns or over which it holds an easement or other authority and that are located in the town's priority areas to ensure their long-term effectiveness. This plan will require an annual inspection of those retention / detention ponds and stormwater treatment structures and removal of accumulated sediment and pollutants in excess of 50% design capacity.

5.3 Directly Connected Impervious Area (DCIA) mapping

Middletown will follow guidance provided by DEEP and UConn CLEAR to calculate the Directly Connected Impervious Area (DCIA) that contributes stormwater runoff to each of its MS4 outfalls. Progress on this task will be documented in each Annual Report until completion.

5.4 Address post-construction issues in areas with pollutants of concern

For areas contributing to waters where bacteria is a Stormwater Pollutant of Concern and erosion or sedimentation problems are found during the annual inspections conducted under the long-term maintenance plan described in BMP 5.2, Middletown will prioritize those areas for the DCIA retrofit program under minimum control measure 6 – Pollution Prevention/Good Housekeeping.

Post-construction stormwater management schedule

BMP	Lead department / individual	Month / year of implementation	Measurable goal
Establish or update legal authority and guidelines regarding LID and runoff reduction in site development planning	Director of Planning, Conservation & Development	July 1, 2021	Update the subdivision regulations to require developers to consider low impact development and runoff reduction site planning practices. The exiting regulations can be found at: http://www.middletownplanning.com/zoningcode/pzcode10.html
Enforce LID/runoff reduction requirements for development and redevelopment projects	Director of Planning, Conservation & Development	July 1, 2021	Develop and implement appropriate enforcement procedures and actions.
Implement long-term maintenance plan for stormwater basins and treatment structures	William Russo, DPW Director	July 1, 2019	Develop a maintenance plan for ensuring long-term effectiveness of retention ponds and treatment structures. Annually inspect all such ponds and structures.
Complete DCIA mapping	Thomas Nigosanti, City Engineer, DPW	July 1, 2020	Calculate DCIAs that contribute SW runoff to each MS4 outfall. Document the progress in each annual report.
Address post-construction issues in areas with pollutants of concern	Director of Planning, Conservation & Development	July 1, 2019	Address erosion and sediment problems noted during inspections of retention ponds and treatment structures for discharges to impaired waters. Develop, fund, implement, and prioritize a program to address these problems under the Retrofit program. Establish a schedule to correct the problems and establish a short and long term maintenance program. Include details of the program and progress in the annual report.

(6) Pollution Prevention / Good Housekeeping

This minimum control measure outlines a program to mitigate the impact of town operations and maintenance on town owned and/or operated properties and the MS4 itself to water quality.

Goal:

Prevent or reduce pollutant runoff as a result of municipal operations.

Middletown will implement an operations and maintenance program to prevent or reduce pollutant runoff from town facilities and protect water quality.

6.1 Develop and implement formal employee training program

Middletown will continue its MS4 training program for town employees to increase awareness of water quality issues. Training will include:

- Standard operating procedures consistent with the MS4 general permit;
- General goals and objectives of this Stormwater Management Plan;
- Identification and reporting of illicit discharges and improper disposal; and
- Spill response protocols and responsibilities.

These trainings may also include regional or statewide trainings coordinated by UConn CLEAR or others. William Russo, DPW Director, will be responsible for administering the program.

6.2 Implement MS4 property and operations maintenance

Middletown-owned or -operated properties, parks, and other facilities that are owned, operated, or otherwise the legal responsibility of Middletown will be maintained so as to minimize the discharge of pollutants to its MS4. Such maintenance will include, but not be limited to:

(i) Parks and open space

Middletown will optimize the application of fertilizers by municipal employees, institutional staff, or private contractors on lands and easements for which it is responsible for maintenance. Optimization practices considered may include:

- conducting soil testing and analysis to determine soil phosphorus levels,
- the reduction or elimination of fertilizers,
- reduction of fertilizer usage by adhering to the manufacturers' instructions,
- use of alternative fertilizers forms (i.e. products with reduced, slow-releasing, or insoluble phosphorus compositions),
- proper storage and application practices (i.e. avoid impervious surfaces),
- application schedule (i.e. appropriate season or month) and timing (i.e. coordinated with climatic conditions to minimize runoff potential);
- standard operating practices for the handling, storage, application, and disposal of pesticides and herbicides in compliance with applicable state and federal laws;
- evaluating reduced mowing frequencies and use of alternative landscaping materials like drought resistant and native plantings;
- establish procedures for management of trash containers at parks (scheduled cleanings; sufficient number).

Middletown will establish practices for the proper disposal of grass clippings and leaves at Middletown-owned lands. Clippings shall be composted or otherwise appropriately disposed. Clippings will not enter the MS4 system or waters of the state.

(ii) Pet waste management

Middletown will identify locations where inappropriate pet waste management practices are immediately apparent and pose a threat to receiving water quality due to proximity and potential for direct conveyance of waste to its storm system and waters.

In such areas, Middletown will, implement targeted management efforts such as public education and enforcement (e.g. increased patrol for violators).

In Middletown-owned recreational areas where dog walking is allowed, Middletown will install educational signage, pet waste baggies, and disposal receptacles (or require carry-out).

Middletown will document its efforts in its annual reports. Middletown should consider including information regarding the scope and extent of its education, compliance, and enforcement efforts (including the number of violations pursued and fines levied or other enforcement taken).

(iii) Waterfowl management

Middletown will identify lands where waterfowl congregate and feeding by the public occurs.

To raise awareness regarding the water quality impacts, Middletown will install signage or use other targeted techniques to educate the public about the detrimental impacts of feeding waterfowl (including the resulting feces deposition) and discourage such feeding practices.

Middletown will also implement practices that discourage the undesirable congregation of waterfowl in these areas, or otherwise isolate the direct drainage from these areas away from its storm system and waters.

(iv) Middletown Buildings and facilities (schools under the jurisdiction of Middletown, town offices, police and fire stations, pools, parking garages and other Middletown-owned or operated buildings or utilities)

Middletown will:

- evaluate the use, storage, and disposal of both petroleum and non-petroleum products and ensure, through employee training, that those responsible for handling these products know proper procedures;
- ensure that Spill Prevention Plans are in place, if applicable, and coordinate with the fire department as necessary;
- develop management procedures for dumpsters and other waste management equipment;
- sweep parking lots and keep areas surrounding the facilities clean to minimize runoff of pollutants;
- ensure that all interior building floor drains are not connected to the MS4 and are appropriately permitted.

(v) Vehicles and Equipment

Middletown will

- establish procedures for the storage of Middletown-owned or -operated vehicles;
- require vehicles with fluid leaks to be stored indoors or in contained areas until repaired;
- evaluate fueling areas owned by Middletown and used by Middletown owned or -operated vehicles and if possible, place fueling areas under cover in order to minimize exposure;
- establish procedures to ensure that vehicle wash waters are not discharged to the municipal storm sewer system or to surface waters;
- ensure any interior floor drains are appropriately permitted.

(vi) Leaf Management

Middletown will establish and implement procedures to minimize or prevent the deposition of leaves in catch basins, streets, parking lots, driveways, sidewalks or other paved surfaces that discharge to the MS4. Such procedures shall also apply to leaves collected by Middletown.

6.3 Implement coordination with interconnected MS4s

Middletown will coordinate with operators of interconnected MS4s (such as neighboring municipalities, institutions and DOT) regarding the contribution of potential pollutants from the storm sewer systems, contributing land use areas and stormwater control measures in the respective MS4s. This same coordination shall be conducted regarding operation and maintenance procedures utilized in the respective systems.

6.4 Develop and implement a program to control other sources of pollutants to the MS4

Middletown will develop and implement a program to control the contribution of pollutants to its MS4 from commercial, industrial, municipal, institutional or other facilities, not otherwise authorized by a CT DEEP stormwater permit.

6.5 Evaluate additional measures for discharges to impaired waters

For waters for which Bacteria is a Stormwater Pollutant of Concern:

On Middletown-owned or -operated lands with a high potential to contribute bacteria (such as dog parks, parks with open water, sites with failing septic systems), Middletown will develop, fund, implement, and prioritize a retrofit or source management program to correct the problem(s) within a specific timeframe. Each Annual Report will identify problem areas for which a retrofit or source management program were developed, the location of the closest outfall monitored in accordance with Section 6(*i*), the cost of such retrofit or program, and the anticipated pollutant reduction. On Middletown-owned or -operated lands, prohibit the feeding of geese or waterfowl and implement a program to manage geese and waterfowl populations. Each Annual Report will discuss the actions taken to implement this program.

6.6 Track projects that disconnect DCIA

Middletown will annually track the total acreage of Directly Connected Impervious Area (DCIA) that is disconnected from the MS4 as a result of redevelopment or retrofit projects within the town. For each retrofit/redevelopment project, Middletown will document the amount of existing DCIA that is disconnected. The total amount of disconnected DCIA will be reported each year in the Annual Report. Starting on July 1, 2021, Middletown's goal will be to reduce 1% of its total DCIA acreage per year to the maximum extent possible. Middletown will provide updates on this goal in its annual report. Middletown will also incorporate all DCIA disconnections which occurred in the town since July 1, 2012 towards meeting this goal.

6.7 Develop and implement an infrastructure repair, rehabilitation and retrofit program

Middletown will continue to develop a program to identify MS4 structures to repair, rehabilitate, or upgrade to reduce or eliminate the discharge of pollutants into water bodies. This program will be responsive to new information on outfalls discharging pollutants, impaired waters, inspections, or observations made during outfall mapping under the IDDE section of this plan.

6.8 Develop and implement plan to identify and prioritize retrofit projects

Middletown will develop a Retrofit Project Plan to identify and prioritize potential DCIA disconnection projects. Prioritization will be based on several factors, including whether the project lies within one of the MS4 priority areas (urbanized area, DCIA > 11%, discharge to impaired waters). Middletown will include in its annual report for the third year of the permit (2020-2021) its identification and prioritization process, a rationale for the selection of projects to be implemented, and the total acres of DCIA to be disconnected upon implementation. The implementation of projects in this plan will begin by June 30, 2022.

6.9 Develop and implement street sweeping program

Middletown will implement a program to provide for regular inspection and maintenance of Middletown-owned or -operated streets, parking areas and other MS4 infrastructure.

Middletown will establish and implement procedures for sweeping town-owned or operated streets and parking lots. All streets and parking lots within the MS4 Priority Areas will be inspected, swept and/or cleaned (as necessary) at least once per year in the spring following the cessation of winter maintenance activities (i.e. sanding, deicing, etc.). The procedures shall also include more frequent inspections, cleaning and/or sweeping of targeted areas determined by Middletown to have increased pollutant potential based on the presence of active construction activity or other potential pollutant sources. Middletown will identify such potential pollutant sources based upon surface inspections, catch basin cleaning or inspection results, land use, winter road deicing and/or sand application, impaired or TMDL waters or other relevant factors as determined by Middletown. If wet dust suppression is conducted, the use of water will be minimized such that a discharge of excess water to surface waters and/or the storm sewer system does not occur.

For streets and parking lots outside the MS4 Priority Areas, including any rural uncurbed streets and parking lots with no catch basins, Middletown will either meet the minimum frequencies above, or develop and implement an inspection, documentation and targeted sweeping and/or cleaning plan for those areas by June 30, 2018 and submit such plan with its year one Annual Report. For new and redeveloped municipal parking lots, Middletown will evaluate options for reducing stormwater runoff to surface waters and/or the storm sewer system by the installing pervious pavements and/or other measures to promote sheet flow of stormwater.

a. Middletown will ensure the proper disposal of street sweepings in accordance with DEEP policies, guidance and regulations. Sweepings shall not be discharged back into the storm drain system and/or surface waters.

b. Middletown will document results of its sweeping program in its annual reports including: a summary of inspection results, curb miles swept, dates of cleaning, volume or mass of material collected, and method(s) of reuse or disposal. Middletown will also include documentation of any alternate sweeping plan for rural uncurbed streets and any runoff reduction measures implemented.

6.10 Develop and implement catch basin cleaning program

Middletown will conduct routine cleaning of all catch basins and track catch basin inspection observations. Utilizing information compiled through its inventory of catch basins, operational staff and public complaints, Middletown will optimize routine cleaning frequencies for particular structures or catchment areas as follows to maintain acceptable sediment removal efficiencies:

a. Inspect all Middletown-owned catch basins within MS4 Priority Areas at least once by June 30, 2020. Catch basins outside the MS4 Priority Areas shall be inspected by June 30, 2022.
b. Prioritize inspection and maintenance for Middletown-owned catch basins located near impaired waters and construction activities (roadway construction, residential, commercial, or industrial development or redevelopment). Middletown will clean catch basins in such areas more frequently if inspection and maintenance activities indicate excessive sediment or debris loadings.
c. Establish a schedule such that the frequency of routine cleaning will ensure that no catch basin at any time will be more than fifty (50) percent full. A catch basin sump is more than 50 percent full if the contents within the sump exceed one half the distance between the bottom interior of the catch basin to the invert of the deepest outlet of the catch basin.
d. If a catch basin sump is more than fifty (50) percent full during two consecutive routine inspections/cleaning events, Middletown will document that finding, investigate the contributing drainage area for sources of excessive sediment loading, and to the maximum extent practicable, abate contributing sources. Middletown will describe any actions taken in its Annual Report.
e. Middletown will detail its plan for optimizing catch basin cleaning, inspection plans, and its schedule for gathering information to develop the optimization plan in its first annual report. Documentation shall include metrics and other information used to reach the determination that the established plan for cleaning and maintenance is optimal for the MS4. Middletown will keep a log of catch basins cleaned or inspected.
f. Middletown will report in each Annual Report the total number of catch basins, number inspected, number cleaned, the total volume or mass of material removed from all catch basins and, if practicable, the volume or mass of material removed from each catch basin draining to water quality limited waters.

6.11 Develop and implement snow management practices

(i) Deicing Material Management

Middletown will develop and implement standard operating practices for the use, handling, storage, application, and disposal of deicing products such as salt and sand to minimize exposure to stormwater; consider means to minimize the use and optimize the application of chloride-based or other salts or deicing product (while maintaining public safety) and consider opportunities for use of alternative materials; for any exterior containers of liquid deicing materials installed after July 1, 2017, Middletown will provide secondary containment of at least 110% of the largest container or 10% of the total volume of all containers, whichever is larger, without overflow from the containment area.

(ii) Snow and Ice Control Practices

Middletown will implement and refine its standard operating practices regarding its snow and ice control to minimize the discharge of sand, anti-icing or de-icing chemicals and other pollutants (while maintaining public safety).

Middletown will establish goals for the optimization of sand and/or chemical application rates through the use, where practicable, of automated application equipment (e.g. zero-velocity spreaders), anti-icing and pre-wetting techniques, implementation of pavement management systems, and alternate chemicals.

Middletown will maintain records of the application of sand, anti-icing and/or de-icing chemicals to document the reduction of chemicals to meet established goals.

Middletown will ensure the proper training for deicing applications for municipal employees, institutional staff, or private contractors on lands and easements for which it is responsible for maintenance.

Middletown will manage and dispose of snow accumulations in accordance with DEEP's Best Management Practices for Disposal of Snow Accumulations from Roadways and Parking Lots, revised 2/4/11 and as amended (see link at: www.ct.gov/deep/stormwater).

In its Annual Report, Middletown will document results of its snow removal program including, at a minimum: the type of staff training conducted on application methods and equipment, type(s) of deicing materials used; lane-miles treated; total amount of each deicing material used; type(s) of deicing equipment used; any changes in deicing practices (and the reasons for the change); and snow disposal methods.

6.12 Interconnected MS4s

Middletown will coordinate with operators of interconnected MS4s (such as neighboring municipalities, institutions and DOT) regarding the contribution of potential pollutants from the storm sewer systems, contributing land use areas and stormwater control measures in the respective MS4s. This same coordination will be conducted regarding operation and maintenance procedures utilized in the respective systems.

6.13 Sources contributing pollutants to the MS4

Middletown will develop and implement a program to control the contribution of pollutants to its MS4 from commercial, industrial, municipal, institutional or other facilities, not otherwise authorized by permit issued pursuant to Sections 22a-430 or 22a-430b of the Connecticut General Statutes.

6.14 Additional measures for discharges to impaired waters (with or without a TMDL)

For waters for which Bacteria is a Stormwater Pollutant of Concern:

On Middletown-owned or -operated lands with a high potential to contribute bacteria (such as dog parks, parks with open water, sites with failing septic systems), Middletown will develop, fund, implement, and prioritize a retrofit or source management program to correct the problem(s) within a specific timeframe. Annual Reports will identify problem areas for which a retrofit or source management program were developed, the location of the closest outfall monitored in accordance with Section 6(i), the cost of such retrofit or program, and the anticipated pollutant reduction. On Middletown-owned or -operated lands, Middletown will prohibit the feeding of geese or waterfowl and implement a program to manage geese and waterfowl populations. Annual Reports will discuss the actions taken to implement this program.

Pollution prevention/ good housekeeping schedule

BMP	Lead department / individual	Month / year of implementation	Measurable goal
Develop/implement formal employee training program	William Russo, DPW Director	Ongoing and complete before 7/1/2018	Include new elements of the permit in the training program using PowerPoint or handouts.
Implement MS4 property and operations maintenance	Robert Russo, Superintendent of Streets and Sanitation	7/1/2017	List each property type with relevant BMPs. Develop relevant metrics to measure progress of each.
Implement coordination with interconnected MS4s	Thomas Nigosanti, City Engineer, DPW	Before 7/1/2018	Plan will include a list of neighboring municipalities, institutions and DOT whose MS4 systems are interconnected and coordinate the management of the storm sewer systems and land use. The goal is to make contact with each one and create/allocate responsibilities that can be shared.
Develop/implement program to control other sources of pollutants to MS4	Thomas Nigosanti, City Engineer, DPW	Before 7/1/2022	Identify commercial, industrial, institutional or other facilities which may contribute pollutants to the MS4 system. Include a list of their activities, potential pollutants and control methods in the plan.
Evaluate additional measures for discharges to impaired waters	Thomas Nigosanti, City Engineer, DPW	Before 7/1/2018	On lands with a high potential to contribute bacteria, develop, fund, implement, and prioritize a retrofit or source management program to correct problems. Include details in the Annual Report, including the location of the closest outfall monitored, cost of retrofit, and anticipated pollutant reduction. Prohibit the feeding of geese or waterfowl and implement a program to manage geese and waterfowl populations and describe actions taken in each Annual Report.
Track projects that disconnect DCIA	Thomas Nigosanti, City Engineer, DPW	Begin July 1, 2017 Begin July 1, 2021	Annually track the total acreage of DCIA that is disconnected as a result of redevelopment or retrofit projects. The amount of existing DCIA that is modified/disconnected will be documented. Disconnections from such projects implemented after 7/1/2012 may be included. Goal will be to reduce 1% of total DCIA acreage per year starting in 2021.
Develop/implement infrastructure repair/rehab program	Thomas Nigosanti, City Engineer, DPW	Begin July 1, 2017	Develop and implement a program to evaluate and prioritize the repairing, retrofitting or upgrading of conveyances, structures and outfalls of the MS4. Monitoring results, impaired waters, inspection observations or observations made during outfall mapping will be used to develop this program.
Develop/implement plan to identify/prioritize retrofit projects	Thomas Nigosanti, City Engineer, DPW	Before July 1, 2020	1) Identify and prioritize developed sites with DCIA of 40% or more and develop a plan to retain half the water quality volume for the site, or retain runoff volume to the maximum extent achievable.

			2) Identify and prioritize developed sites with DCIA of less than 40% and develop a plan to retain all the water quality volume for the site, or provide documentation of site constraints that prevent retention.
BMP	**Lead department / individual**	**Month / year of implementation**	**Measurable goal**
Develop/implement street sweeping program	William Russo, DPW Director	Before 7/1/2018	1) Identify streets and parking lots within the Urbanized Area, and outside the Urbanized Area with either DCIA of greater than 11% or which discharge to impaired waters. Develop a program to inspect and sweep and/or cleaned (as necessary) with a minimum frequency of once per year in the spring. Areas that require additional inspections, cleaning and/or sweeping will be identified based on increased pollutant potential due to active construction activity or other potential pollutant sources. 2) Identify streets and parking lots outside the Urbanized Area and outside the catchment areas of the MS4 with either DCIA of greater than 11% or which discharge to impaired waters, including any rural uncurbed streets and parking lots with no catch basins. Develop a similar program and implementation schedule as stated in 1) above, or develop and implement such a plan by 6/30/2018. Submit such plan with the first year Annual Report.
Develop/implement catch basin cleaning program	William Russo, DPW Director	Complete by April 1, 2018 and document in first Annual Report due April 1, 2018 At least once by June 30, 2020 At least once by June 30, 2022	Continue to conduct routine cleaning of all catch basins. A tracking table and/or ranking system will be implemented to manage the program. Frequency of cleaning and inspections will be based on location (inside or outside of UA), DCIA percent, discharges to impaired waters, proximity to construction activities and/or indications of excessive sediment or debris loadings. Documentation to optimize the program metrics such as the total number of catch basins, number inspected, number cleaned, the total volume or mass of material removed from all catch basins and, if practicable, the volume or mass of material removed from each catch basin draining to water quality limited waters. This information will also be included in the annual report. Inspect all catch basins within MS4 Priority Areas. Inspect all catch basins outside MS4 Priority Areas
Develop/implement snow management practices	William Russo, DPW Director	Before 6/30/2018	Develop and implement standard operating practices for the use, handling, storage, application, and disposal of deicing products (salt and

			sand) to minimize exposure to stormwater. Track efforts to minimize the use and optimize the application of chloride-based or other salts or deicing products. Metrics may include the volume of sand and salt applied per hourly length of storm, inches of snow or temperature and other variables. The use of automated application equipment (e.g. zero- velocity spreaders), anti-icing and pre-wetting techniques, implementation of pavement management systems, and alternate chemicals will be considered and tracked. Records of the application of sand, anti-icing and/or de-icing chemicals will be kept to document the reduction of chemicals to meet established goals. A reasonable reduction in the percent of sand, anti-icing and/or de-icing chemicals used will be considered.
Develop program to manage and dispose of snow accumulations	William Russo, DPW Director	Document in first Annual Report due April 1, 2018	The annual report will document results of the snow removal program including type of staff training conducted on application methods and equipment, type(s) of deicing materials used; lane-miles treated; total amount of each deicing material used; type(s) of deicing equipment used; any changes in deicing practices (and the reasons for the change); and snow disposal methods.

Outfall Monitoring

Town of Middletown will monitor and investigate all MS4 outfalls that discharge to impaired waterbodies by the end of the permit term. Using the outfall inventory developed under the IDDE minimum control measure, Middletown will identify which outfalls discharge to impaired waters and screen them for the specific impairments.

Once half of all outfalls discharging to impaired waterbodies have been screened, the 6 outfalls contributing the highest level of pollutants will be identified and screened on an annual basis.

Based on the screening results, Middletown will investigate the drainage areas of outfalls that are contributing to the impairment. The investigations may consider land use or development patterns, business or commercial activities, industrial activities, DCIA, natural contributors, MS4 maintenance issues, residential activities, or anything else potentially contributing to the source of the impairment.

Based on results of the drainage area investigations, Middletown will implement measures to address sources of the impairments including the specific impaired waters provisions described within the permit control measures.

BMP	**Lead department / individual**	**Month / year of implementation**	**Measurable goal**
Outfall screening	Thomas Nigosanti, City Engineer, DPW	Begin by 6/30/2018 Complete at least 50% before 6/30/2020	Monitor the outfalls that discharge to impaired water for the pollutants of concern. (Escherichia coli is the only pollutant of concern for any of the impaired waters in Middletown.) Identify discharges to Classes A and B surface waters. (See Tables 1 and 2) Conduct follow-up investigations for any outfalls with E. coli >235 col/100ml for swimming areas.

		Screen all by 6/30/2022	See note below for SB classifications.
Inventory and mapping of discharges to impaired waters	Thomas Nigosanti, City Engineer, DPW	Complete by 6/30/2019	Create an inventory of all outfalls that discharge to impaired waters. Identify such outfalls on a map.
Follow-up investigation of drainage areas	Thomas Nigosanti, City Engineer, DPW	Begin by 6/30/2019	Identify land use or development patterns; business or commercial activities; industrial activities; DCIA; natural contributors; potential MS4 maintenance issues; residential activities; and any other activities as potentially contributing to the related impairment. Implement a BMP program as necessary.
Annual monitoring of priority outfalls	Thomas Nigosanti, City Engineer, DPW	Begin by 6/30/2021	Identify 6 of the highest contributors of E. coli and sample these six outfalls annually.

Note: The CT River is classified as SB for water quality which is a marine classification. Ms. Karen Allen, DEEP Water Permitting and Enforcement Division, and staff in the Water Planning and Standards Division clarified that the required parameter for the Middletown area of the CT River is E. coli. However, as noted previously in this plan, there is no TMDL established for the CT River CT4000-00_02, and discharges from the Middletown MS4 to section CT4000-00_01 are expected to be minimal, if any. Thus, priority will be given to the other waterbodies listed in Table 2 in the Introduction of this plan.

Plan Amendments

Middletown will amend the SMP whenever:

(1) there is a change which has the potential to cause pollution of the waters of the state; or

(2) the actions required by the Plan fail to prevent pollution of the waters of the state or fail to otherwise comply with any other provision of this general permit; or

(3) the Commissioner requests modification of the Plan.

Stormwater Management Plan Signature

"I have personally examined and am familiar with the information submitted in this document and all attachments thereto, and I certify that, based on reasonable investigation, including my inquiry of those individuals responsible for obtaining the information, the submitted information is true, accurate and complete to the best of my knowledge and belief. I understand that a false statement made in this document or its attachments may be punishable as a criminal offense, in accordance with Section 22a-6 of the Connecticut General Statutes, pursuant to Section 53a-157b of the Connecticut General Statutes, and in accordance with any other applicable statute."

William Russo	Director of Public Works	_____
Chief Elected Official/ Principal Executive Officer	Title	Date

_____

Signature

Sharon Finney	President, Monarch Environmental, LLC	_____
Principal plan preparer	Title	Date

_____

Signature

Stormwater Management Plan Engineering Certification

"I hereby certify that I am a qualified professional engineer, as defined in the General Permit for the Discharge of Stormwater from Small Municipal Separate Storm Sewer Systems. I am making this certification in connection with a registration under such general permit, submitted to the Commissioner by Daniel Drew for an activity located at or within the City of Middletown. I have personally examined and am familiar with the information that provides the basis for this certification, including but not limited to all information described in Section 3(b)(9)(A) of such general permit, and I certify, based on reasonable investigation, including my inquiry of those individuals responsible for obtaining such information, that the information upon which this certification is based is true, accurate and complete to the best of my knowledge and belief. I certify, based on my review of all information described in Section 3(b)(9)(A) of such general permit and on the standard of care for such projects, that I have made an affirmative determination in accordance with Section 3(b)(9)(B) of this general permit. I understand that this certification is part of a registration submitted in accordance with Section 22a-430b of Connecticut General Statutes and is subject to the requirements and responsibilities for a qualified professional in such statute. I also understand that knowingly making any false statement in this certification may be punishable as a criminal offense, including the possibility of fine and imprisonment, under section 53a-157b of the Connecticut General Statutes and any other applicable law."

Thomas Nigosanti

Name

City of Middletown Engineer

Title

City of Middletown

Company

13031

Qualified Professional License Number

_____

Signature

_____

Date

Appendix A

General Permit for the Discharge of Stormwater from
Small Municipal Separate Storm Sewer Systems
(Click on the link below)

Small MS4 General
Permit 2017 - 2022.p

Appendix B

Middletown's Registration for the MS4 General Permit

(Click on the link below)

MS4 registration
2017.doc

Middletown's Registration for the MS4 General Permit
Part III – Impaired Waters List Continued

(Click on the link below)

MS4 registration
2017 Pg 3 Watershed

Appendix C

USGS Quadrangle Map
(Click on the link below)

USGS Quad Map
Middletown.pdf

Appendix D

Impaired Waters Table

(Click on the link below)

Impaired_Waters_Table 2011 updated as

Appendix E

Surface Water Classifications

(Click on the link below)

Surface Water Classifications.pdf

Appendix F

Connecticut Integrated Water Quality Report

(Click on the link below)

Appendix G

Natural Diversity Data Base Map

(Click on the link below)

Natural Diversity Database.pdf

Appendix H

Aquifer Protection Areas

(Click on the link below)

Aquifer Protection Areas.pdf

Appendix I

National Register of Historic Places in Middletown

The following properties are listed on the CT Register of Historic Places found at the following url: http://www.nationalregisterofhistoricplaces.com/CT/state.html#pickem

Alsop, Richard IV, House (added 1970 - - #70000686)

Also known as Davison Art Center

301 High St., Middletown

Arrawanna Bridge (added 2004 - - #04001092)
Also known as Bridge No. 4536
Berlin St. at Coginchaug R., Middletown

Broad Street Historic District (added 1988 - - #88001319)
Roughly bounded by High, Washington, Broad and Church Streets, Middletown

Church of the Holy Trinity and Rectory (added 1979 - - #79002615)
Also known as See Also: Broad Street Historic District
381 Main St. and 144 Broad St., Middletown

Coite-Hubbard House (added 1978 - - #78002846)

Also known as President's House

269 High St., Middletown

Connecticut General Hospital for the Insane (added 1985 - - #85001920)
Also known as Connecticut Valley Hospital
Silver St. E. of Eastern Dr., Middletown

(1000 acres, 27 buildings)

Highland Historic District (added 1982 - - #82003770)
Atkins St. and Country Club Rd., Middletown

(800 acres, 12 buildings)

Hubbard, Nehemiah, House (added 1982 - - #82003771)
Laurel Grove Rd. and Wadsworth St., Middletown

Historic Districts

Main Street Historic District
(added 1983 - Middlesex County - #83001275)
Also known as Main Street
Roughly Main St. between College and Hartford Ave., Middletown
(205 acres, 76 buildings, 10 objects)

Metro South Historic District
(added 1980 - Middlesex County - #80004064)
Also known as See Also: South Green National Register District
Main and College Streets, Middletown
(90 acres, 15 buildings)

Middletown South Green Historic District
(added 1975 - Middlesex County - #75001922)
Union Park area, on S. Main, Crescent, Pleasant, and Church Streets, Middletown
(900 acres, 30 buildings)

Wadsworth Estate Historic District
(added 1996 - Middlesex County - #96000775)
Also known as Long Hill; The Cenacle; See Also: Nehemiah Hubbard House
15, 30, 33, 59, 73, 89 Laurel Grove Rd., Wadsworth Falls State Park, and 421 Wadsworth St. , Middletown
(2700 acres, 7 buildings, 7 structures)

Washington Street Historic District
(added 1985 - Middlesex County - #85001018)
Roughly bounded by Washington and Main Streets, Washington Terrace and Vine St. , Middletown
(310 acres, 32 buildings)

Wilcox, Crittenden Mill
(added 1986 - Middlesex County - #86003349)
Also known as Wilcox, Crittenden Mill Historic District
234--315 S. Main St., Pameacha, and Highlands Aves. , Middletown
(170 acres, 4 buildings)