

Illicit Discharge Detection and Elimination (IDDE) Program

TOWN OF PUTNAM

June 29, 2018

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Instructions: Update table of contents accordingly based on the final document.

1 Introduction

1.1 MS4 Program

The MS4 Permit requires that each permittee, or regulated community, address six Minimum Control Measures. These measures include the following:

1. Public Education and Outreach
2. Public Involvement/Participation
3. Illicit Discharge Detection and Elimination
4. Construction Site Stormwater Runoff Control
5. Post-Construction Stormwater Management in New Development or Redevelopment
6. Pollution Prevention/Good Housekeeping.

Under Minimum Control Measure 3, the permittee is required to implement an IDDE program to provide the legal authority to prohibit and eliminate illicit discharges to the MS4, find the source of any illicit discharges, eliminate those illicit discharges, and ensure ongoing screening and tracking to prevent and/or eliminate future illicit discharges. The IDDE program must also be recorded in a written (hardcopy or electronic) document and meet the IDDE program requirements specified in the MS4 Permit. This document has been prepared to address this requirement.

1.2 Geographic Scope of IDDE Program

The MS4 Permit requires municipalities to implement the IDDE program within the Urbanized Area (based on 2010 U.S. Census) and those catchment areas of the MS4 with either Directly Connected Impervious Area (DCIA) of greater than 11% or which discharge directly to impaired waters (i.e., “priority” areas). **Figure 1-1** depicts the urbanized area and other areas outside of the urbanized area that, collectively, may be considered priority areas within the TOWN OF PUTNAM.

FIGURE 1-1 PUTNAM PRIORITY AREAS
INCLUDES URBANIZED AREA, IMPAIRED WATERSHEDS, AND DCIA > 11%

MAY 2018 NOT TO SCALE

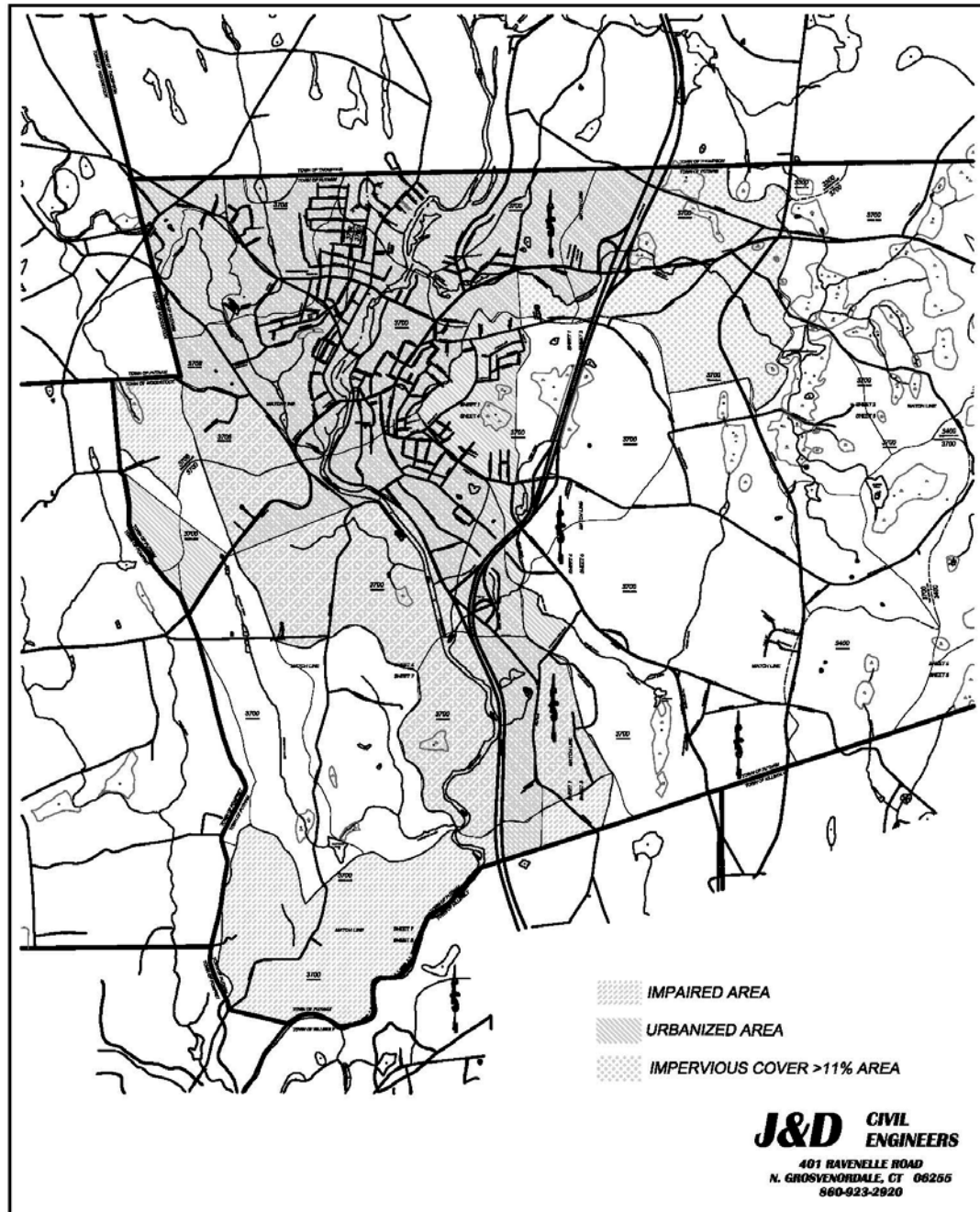


Figure 1-1. Urbanized Areas and Other Areas Potentially Subject to the MS4 Permit IDDE Program Requirements (“Priority Areas”)

1.3 Receiving Waters and Impairments

Table 1-1 lists the impaired waters within the boundaries of the TOWN OF PUTNAM based on the latest version of the State of Connecticut Integrated Water Quality Report produced by CTDEEP every two years. 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.

Table 1-1. Impaired Waters

Waterbody Name	Segment ID	Category	Impairment and Stormwater Pollutant of Concern	Approved TMDL
QUINEBAUG RIVER	3700-00_04 &05	5	Not Supporting Recreation – E.coli (bacteria) Habitat for fish, other aquatic life and wildlife – cause unknown	no
LITTLE RIVER	3708-00_01	4a	Not Supporting Recreation – E.coli (bacteria)	yes
WHEATON BROOK	3708-18_01	5	Not Supporting Recreation – E.coli (bacteria)	no

Source: State of Connecticut 2016 Integrated Water Quality Report (CTDEEP) draft dated January 2017, reflects recommended listings and de-listings.

Category 5 Waters – Available data and/or information indicate that one or more designated uses are not being supported and a TMDL is needed.

1.4 IDDE Program Goals, Framework, and Timeline (BMP 5 in Stormwater Plan)

The objective of the IDDE program is to systematically find and eliminate sources of non-stormwater discharges to the MS4 and implement procedures to prevent such discharges. The program consists of the following major components as outlined in the MS4 Permit, pages 22-24 and further clarified in Appendix, B pages 1-13.

- Legal authority to prohibit illicit discharges and enforce this prohibition – BMP 5c
- Program for citizen reporting of illicit discharges – BMP 1
- Storm system mapping – BMP 3
- Sanitary Sewer Overflow (SSO) elimination – BMP 4
- Assessment and priority ranking of catchments – BMP 5c
- Outfall and interconnection screening and sampling – BMP 5d
- Catchment investigations -
- Identification/confirmation of illicit sources
- Illicit discharge removal
- Follow-up screening
- Employee training – BMP 7

The IDDE investigation protocol framework is shown in **Figure 1-2**. The required timeline for implementing the IDDE program is shown in **Table 1-2**.

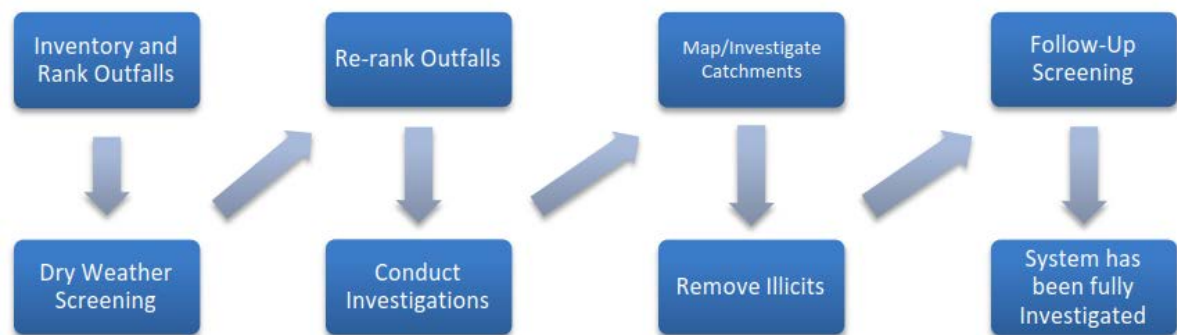


Figure 1-2. IDDE Investigation Procedure Framework

Table 1-2. IDDE Program Implementation Timeline

IDDE Program Requirement	Deadline					
	Year 1	Year 2	Year 3	Year 4	Year 5	Year 10
SSO Inventory (5-year look back)	Oct 30, 2017					
Program for Citizen Reporting	Effective Date					
Establish IDDE Legal Authority	July 1, 2018					
Written IDDE Program	July 1, 2018					
Outfall/Interconnection Inventory		July 1, 2019				
Map All Stormwater Outfalls		July 1, 2019				
Initial Assessment and Priority Ranking of Catchments (update annually)		July 1, 2019				
Complete Detailed Storm System Mapping			July 1, 2020			
Begin Dry Weather Outfall Screening (high and low priority outfalls)	July 1, 2018					
Complete Dry Weather Outfall Screening (high and low priority outfalls)					July 1, 2022	
Catchment Investigations – Problem Outfalls (80% and 100% of problem catchments)			July 1, 2020		July 1, 2022	
Catchment Investigations* – all Problem, High and Low Priority Outfalls						July 1, 2027

*For existing 2004 MS4 permittees, catchment investigations must begin with three months of finalization of investigation procedure and no later than 15 months from effective date of permit. New MS4 permittees must begin these investigations no later than 2 years and 3 months from effective date of permit.

1.5 IDDE Program Accomplishments – 2004 MS4 Permit

The 2004 MS4 Permit required MS4 communities to develop a plan to detect illicit discharges using a combination of storm system mapping, adopting a regulatory mechanism to prohibit illicit discharges and enforce this prohibition, and identifying tools and methods to investigate suspected illicit discharges. MS4s were also required to define how confirmed discharges would be eliminated and how the removal would be documented.

The TOWN OF PUTNAM has completed or implemented the following IDDE program elements consistent with the 2004 MS4 Permit requirements:

- Wet weather outfall monitoring – 6 outfalls monitored
- Outfall mapping - complete
- Additional storm system mapping, including the locations of catch basins, manholes and pipe connectivity- done by on different platforms
- Sanitary Sewer Overflow (SSO) inventory – underway, should be complete by June 30, 2018
- Adoption of an illicit discharge ordinance or similar legal authority – adopted on xx/xx/xx
- Procedures for locating illicit discharges (i.e., visual screening of outfalls for dry weather discharges, dye or smoke testing)
- Procedures for locating the source of the discharge
- Procedures for removal of the source of an illicit discharge
- Procedures for documenting actions and evaluating impacts on the storm sewer system subsequent to removal.

2 Authority and Responsibilities

2.1 Legal Authority – BMP 5a

The TOWN OF PUTNAM has adopted a Municipal Storm Sewer Management ordinance (11/20/2013) . A copy of the Municipal Storm Sewer Management ordinance is provided in **Appendix A**. The ordinance is intended to allow Putnam 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 system
- Implement appropriate enforcement procedures and actions.

The TOWN OF PUTNAM will review its current ordinance and related policies for consistency with the MS4 Permit. The TOWN OF PUTNAM will update, if necessary, its ordinance within one year of the permit effective date (July 1, 2018).

2.2 Statement of Responsibilities – BMP 5b and see also section (b) on page 5 of appendix B

The **##AGENCY OR DEPARTMENT** is the lead municipal agency or department responsible for implementing the IDDE program pursuant to the provisions of the **##NAME OF ORDINANCE**. Other agencies, departments, or personnel with responsibility for aspects of the program include:

Instructions: List the municipal agencies or departments in your community with responsibility for aspects of the IDDE program. Describe the process for coordination and data sharing between these agencies and departments.

The Central Massachusetts Regional Stormwater Coalition “Communicating IDDE Responsibilities” provides suggested language for municipal job descriptions and IDDE program responsibilities.

http://www.centralmastormwater.org/pages/CRSC_documents/CMRSWC_IDDE%20Communication%20Packet.pdf

- Department of Public Works - **##RESPONSIBILITIES**
- Highway Department - **### RESPONSIBILITIES**
- Sewer Department - **##RESPONSIBILITIES**
- Engineering Department - **##RESPONSIBILITIES**
- Building Inspector and/or Code Enforcement Officer - **##RESPONSIBILITIES**
- Licensed Plumbing Inspector - **##RESPONSIBILITIES**
- Health Department - **##RESPONSIBILITIES**
- Inland Wetlands Agent - **##RESPONSIBILITIES**
- Conservation Agent - **##RESPONSIBILITIES**
- Planning Department - **##RESPONSIBILITIES**
- First Selectman, Town Manager, Mayor - **##RESPONSIBILITIES**

3 Citizen Reporting of Illicit Discharges – BMP 1

The MS4 Permit requires municipalities to develop a program for citizen reporting of illicit discharges. The TOWN OF PUTNAM has established a system to allow for citizen reporting which includes an email address or phone number for submitting comments. The reporting system is described on the TOWN OF PUTNAM website and in municipal offices, and consists of ##REPORTING MECHANISM AND PROCESS.

The TOWN OF PUTNAM will investigate and eliminate any illicit discharges reported by citizens or organizations, provided such a report incorporates at least a time and location of an observed discharge. TOWN OF PUTNAM will conduct an inspection of the reported outfalls, manholes or other sites promptly after receiving such a report. The TOWN OF PUTNAM will incorporate the reported outfalls into the IDDE program. Citizen reports and the responses to those reports will be included in the Annual Report.

4 Mapping - BMP 3

The TOWN OF PUTNAM originally developed mapping of its stormwater system to meet the mapping requirements of the 2004 MS4 Permit. The completed elements include a series of maps (8 sheets) of the entire town at 1" = 400' showing the outfall location, size of outfall, type of pipe, drainage basin numbers and the pipe network in a general way in Autocad format (DWG files). A second map has also been developed in GIS format showing catch basins, drain manholes and pipe sizes.

A copy of the existing storm system map is much too large to be provided in **Appendix B**. It is available at Town Hall and the DPW office of Fox Road.

The 2017 MS4 Permit requires a revised and more detailed storm system map than was required by the 2004 MS4 Permit. The ##AGENCY OR DEPARTMENT is responsible for updating the stormwater system mapping pursuant to the MS4 Permit. The TOWN OF PUTNAM will report on the progress towards completion of the storm system map in each annual report.

4.1 Outfall and Interconnection Inventory and Mapping BMP 2 and section (C) on p 23 of GP and section (5) on page 2 of Appendix B. This section is applicable to the entire Town.

The TOWN OF PUTNAM will develop an inventory (spreadsheet or database in a format compatible with Microsoft Excel) and mapping at a minimum scale of 1"=2000' and maximum scale of 1"=100' showing all stormwater outfalls¹ located within and owned or operated by the municipality (or institution for institutional MS4s) and all interconnections² with other MS4s. The map referenced above is in substantial compliance with this requirement and may only need the addition of interconnections.

The inventory will be updated to include the following information for each outfall and interconnection:

- Unique identifier
- Type, material, size (e.g., 24-inch concrete pipe)
- Spatial location (latitude and longitude with a minimum accuracy of +/-30 feet)
- Name, water body ID and Surface Water Quality Classification of the immediate surface water body or wetland to which the stormwater runoff discharges
- If the outfall does not discharge directly to a named water body, the name and water body ID of the nearest named water body to which the outfall eventually discharges
- Name of the watershed, including subregional drainage basin number, in which the discharge is located
- Date of most recent inspection
- Physical condition
- Indicators of potential non-stormwater discharges (including presence or evidence of suspect flow and sensory observations such as odor, color, turbidity, floatables, or oil sheen) as of the most recent inspection.

¹ **Outfall** means a point source as defined by 40 CFR § 122.2 and in Section 2 of the 2017 MS4 Permit as the point where the MS4 discharges to waters of the state. An outfall does not include open conveyances connecting two separate storm sewers or pipes, tunnels or other conveyances that connect segments of the same stream or other waters of the state and that are used to convey waters of the state. It is strongly recommended that a permittee inspect all accessible portions of the system as part of this process. Culverts longer than a simple road crossing shall be included unless the permittee can confirm that they are free of any connections and simply convey waters of the state.

² **Interconnection** means the point where the permittee's MS4 discharges to another MS4 or other storm sewer system, through which the discharge is conveyed to waters of the state or to another storm sewer system and eventually to a water of the state.

The inventory and mapping will be completed within two years of the permit effective date (July 1, 2019).

The inventory will be updated annually to include data collected in connection with dry weather screening and other relevant inspections. ~~An~~ The status of the updated inventory and mapping will be provided in each annual report.

4.2 Detailed System Mapping- BMP 3 and section (6) on page 3 of appendix B

A detailed storm system map will be developed for, at a minimum, the portions of the municipality within “priority” areas. The detailed mapping is intended to facilitate the identification of key infrastructure, factors influencing proper system operation, and the potential for illicit discharges.

The mapping may be produced by hand or computer-aided methods (e.g., GIS or CAD). The mapping is intended to facilitate the identification of key infrastructure and factors influencing proper system operation and the potential for illicit sanitary sewer discharges. The map will include the required infrastructure and water resources information indicated below. The mapping will be updated as necessary to reflect newly discovered information and required corrections or modifications.

The following mapping elements are required:

- Outfalls and receiving waters (previously required by the 2004 MS4 Permit)
- Pipes, catch basins, and/or manholes
- Open channel conveyances (swales, ditches, etc.)
- Interconnections with other MS4s and other storm sewer systems
- Municipally owned stormwater treatment structures (e.g., detention and retention basins, infiltration systems, bioretention areas, water quality swales, gross particle separators, oil/water separators, or other proprietary systems)
- Catchment delineations for use in priority rankings, or prioritizing BMP retrofits
- Water bodies identified by name and indication of all use impairments as identified on the most recent State of Connecticut Integrated Water Quality Report.

The following mapping elements may be included if adequate plans are available.

- Municipal Sanitary Sewer system (if available)

Detailed system mapping will be completed within three years of the effective date of the permit (July 1, 2020).

5 Sanitary Sewer Overflow Inventory – BMP 4

The 2016 MS4 Permit requires municipalities to prohibit illicit discharges, including sanitary sewer overflows (SSOs), to the separate storm sewer system. SSOs are discharges of untreated sanitary wastewater from a municipal sanitary sewer that can contaminate surface waters, cause water quality problems and property damage, and threaten public health. SSOs can be caused by blockages, line breaks, sewer defects that allow stormwater and groundwater to overload the system, power failures, improper sewer design, and vandalism.

The TOWN OF PUTNAM has completed an inventory of SSOs that have discharged to the MS4 in the five years prior to the effective date of the 2017 MS4 Permit (July 1, 2012 – June 30, 2017) (**Table 5-1**). The inventory includes all SSOs that occurred during wet or dry weather resulting from inadequate conveyance capacities or where interconnectivity of the storm and sanitary sewer infrastructure allows for transfer of flow between systems. This information was taken from Bypass Report Forms previously submitted to DEEP.

Upon detection of an SSO, the TOWN OF PUTNAM will eliminate it as expeditiously as possible and take interim measures to minimize the discharge of pollutants to and from its MS4 until the SSO is eliminated. Upon becoming aware of an SSO to the MS4, the TOWN OF PUTNAM will provide written notice to CTDEEP within five (5) days of becoming aware of the SSO occurrence.

The inventory in **Table 5-1** will be updated by the TOWN OF PUTNAM when new SSOs are detected. The SSO inventory will be included in the annual report, including the status of mitigation and corrective measures to address each identified SSO.

Table 5-1. SSO Inventory

SSO Location ¹	Discharge Point ²	Date ³	Time Start ³	Time End ³	Estimated Volume ⁴	Description ⁵	Mitigation Completed ⁶	Mitigation Planned ⁷
Peake Brook Lift Sta	Peake Brook	8/31/12	11:50A M	12:10P M	100 gal	Mech equipment failure	Wash down	Replace Magnetect
Pomfret St/Kennedy DR	Quinebaug River	9/11/12	2:15 PM	2:30 PM	100 gals	Grease blockage	Flush line	Put on 2 week flush schedule
Rec Park Rd/Keech	None	9/13/12	11:00 AM	12:00 PM	100 gals	Electrical equipment failure	Vac wet well	
11 Chapman St	none	9/18/12	10:24 AM	10:50 AM	20 gals	Grease blockage	Sewer jet main	Put on regular schedule
Peake Brook	Peake Brook	10/16/12	11:35 AM	11:45 AM	50 gals	Electrical equipment failure	Reset breaker	Replace breaker
22 Sabin Street	Little River	10/27/12	10:36 AM	11:05 am	50 gals	Grease blockage	Flushed line	
Dufault/Edmond	None	12/6/12	4:02 PM	4:30 PM	50 gals	Grease blockage	Flushed line	
Peake Brook Lift Sta	Little River	12/23/12	5:45 PM	6:15 PM	100 gals	Mechanical equipment failure	Repaired pump	
Rte 44/395 on ramp	non	4/10/13	11:15 AM	12:15 PM	500 gals	Contractor broke force main	Shut down pumps vac wet well	
Peake Brook Sta	Little River	3/28/13	3:27 PM	3:27 PM	50 gals	Mechanical equipment failure	Reset pumps	Double check
Recreation Park Rd	none	4/13/13	5:15 PM	5:40 PM	50 gals	Mechanical equipment failure	Pumped out wet well	
Lift Station No. 1	none	4/19/14	10:55 AM	12:04 PM	100 gals	Electrical equipment failure	Restarted pump	
21 Franklin St	None	5/29/14	11:05 AM	12:15 PM	50 gals	Grease, roots	Flushed blockage	Put on 2 week schedule
Rte 44 Lift Station	none	7/13/14	2:15 PM	2:50 PM	50 gals	Mechanical equipment failure	Rewired floats and controls	recheck
125 Church St	Quinebaug River	3/11/15	11:30 AM	12:15 PM	10 gals	Partial blockage from shield left in MH	Remove shield	Don't leave shields in MH
Rte 44 Pump Sta	Little Dam Tavern Brook	11/24/15	7:00 AM	7:20 PM	50 gals	Mechanical Equipment Failure	Rewire new floats	same

11 Pleasant St	none	12/6/15	12:31 PM	1:15 PM	10 gals	roots	Flushed main	
93 Sabin St	none	2/24/16	5:40 PM	6:30 PM	200 gals	roots	Jet line	
189 Church St	Quinebaug River	3/10/16	11:00 AM	11:35 AM	100 gals	rags	Jet line	Monitor location
Groveland Ave	none	3/24/16	1:30 PM	11:00 AM	1500 gals	Cracked/broken pipe	Plug line, by pass pump	Replace pipe
93 Sabin St	Little River	3/26/16	10:40 AM	12:19 PM	50 gals	Rags/wipes	Jet line	Monitor location
17 Cottage St	none	3/31/16	8:50 AM		10-15 gals	Blockage-other	Jet line	
13 Thompson Ave	none	10/12/16	12:30	13:20	0-50 gals	Blockage - other		
5 Heritage Dr	none	12/15/16	10:00		51-500 gals	Blockage - other		
189 Walnut St	none	2/7/17	12:35	1:30	0-50 gals	roots		
Pomfret/Sabin	none	7/8/17	10:45	11:00	0-50 gals	Blockage - other		
93 Sabin Street	None	11/23/17	11:56	12:45	0-50 gals	roots	cleared	
71 Laurel St	none	12/22/17	10:00	10:45	1-50 gals	blockage	Cleared line	

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 Date(s) and time(s) of each known SSO occurrence (i.e., beginning and end of any known discharge)

⁴ Estimated volume(s) of the SSO occurrence

⁵ Description of the occurrence indicating known or suspected cause(s)

⁶ Mitigation and corrective measures completed with dates implemented

⁷ Mitigation and corrective measures planned with implementation schedules

This table should be updated with information on new SSOs that are detected.

6 Catchment Assessment and Priority Ranking

The MS4 Permit, [appendix B, section \(7\)](#) requires a written [Illicit discharge Detection and Elimination Program](#). [Section \(7\) \(c\)](#) requires an assessment and priority ranking of catchments in terms of their potential to have illicit discharges and SSOs and the related public health significance. The ranking will determine the priority order for screening of outfalls and interconnections, catchment investigations for evidence of illicit discharges, and provides the basis for determining permit milestones.

6.1 Catchment Delineations – BMP 3

A catchment is the area that drains to an individual outfall or interconnection. Catchments will be delineated to define contributing areas for investigation of potential sources of illicit discharges. Catchments are typically delineated based on topographic contours and mapped drainage infrastructure, where available. [Catchment delineations have been completed in Putnam](#). Required updates to the catchment assessment and priority ranking will incorporate refined catchment details as they become available.

6.2 Assessment and Priority Ranking of Catchments – BMP 5c

The **##AGENCY OR DEPARTMENT** will complete an initial illicit discharge potential assessment and priority ranking of catchments based on existing information, including the outfall and interconnection inventory and mapping.

The initial assessment and priority ranking will be completed within two (2) years from the effective date of the permit (by July 1, 2019).

An updated assessment and priority ranking will be provided in each annual report thereafter, including a listing of all catchments and the results of the ranking for each catchment. The assessment and priority ranking will be updated annually based on catchment delineations, the results of dry weather screening, and other relevant information.

Catchments associated with outfalls and interconnections will be classified into one of the following categories:

1. **Excluded Catchments:** Catchments with no potential for illicit discharges. 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.

2. **Problem Catchments:** Catchments with known or suspected contributions of illicit discharges based on existing information. This category includes any catchments where previous outfall/interconnection screening indicates likely sewer input. Likely sewer input indicators are any of the following:

- 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, or
- Ammonia ≥ 0.5 mg/L, surfactants ≥ 0.25 mg/L, and detectable levels of chlorine.

Screening and sampling is not required for Problem Catchments. Problem Catchments must be scheduled for catchment investigation. Following the initial ranking of catchments, subsequent rankings shall not add any catchments to the Problem Catchment category.

3. **High Priority Catchments:** Catchments that have not been classified as Problem Catchments and that are:

- Discharging to an area of concern to public health due to proximity of public beaches, recreational areas, drinking water supplies or shellfish beds
- Determined by the permittee as high priority based on outfall/interconnection screening and catchment characteristics assessment.

Any catchment where outfall/interconnection screening indicates likely sewer input as described under Item 1, Problem Catchments, shall be ranked at the top of the High Priority Catchments category and scheduled for catchment investigation.

4. **Low Priority Catchments:** Catchments determined by the permittee as low priority based on outfall/interconnection screening (see Section 7) and catchment characteristics assessment (see below).

Catchments will be ranked into the above priority categories (except for excluded catchments, which may be excluded from the IDDE program) based on the following characteristics of the defined initial catchment areas, where information is available. Additional relevant characteristics, including location-specific characteristics, may be considered but must be documented in the IDDE program.

-
- **Previous screening results** – previous screening/sampling results indicate likely sewer input (see criteria above for Problem Catchments).
 - **Past discharge complaints and reports.**
 - **Poor dry weather receiving water quality** – the following guidelines are recommended to identify waters as having a high illicit discharge potential:
 - Exceeding water quality standards for bacteria
 - Ammonia levels above 0.5 mg/l

- Surfactants levels greater than or equal to 0.25 mg/l.
- **Density of generating sites** – Generating sites are those places, including institutional, municipal, commercial, or industrial sites, with a potential to generate pollutants that could contribute to illicit discharges. Examples of these sites include, but are not limited to, car dealers; car washes; gas stations; garden centers; and industrial manufacturing areas.
- **Age of development and infrastructure** – Industrial areas greater than 40 years old and areas where the sanitary sewer system is more than 40 years old will probably have a high illicit discharge potential. Developments 20 years or younger will probably have a low illicit discharge potential.
- **Sewer conversion** – Contributing catchment areas that were once serviced by septic systems, but have been converted to sewer connections may have a high illicit discharge potential.
- **Surrounding density of aging septic systems** – Septic systems thirty years or older in residential land use areas are prone to have failures and may have a high illicit discharge potential.
- **Culverted streams** – Any river or stream that is culverted for distances greater than a simple roadway crossing may have a high illicit discharge potential.
- **Water bodies** that receive a discharge from the MS4 and are drinking water supplies, shell fishing areas, beaches or waters used for contact recreation.
- **Impaired water bodies** that receive a discharge from the MS4 or waters with approved TMDLs applicable to the permittee, where illicit discharges have the potential to contain the pollutant identified as the cause of the water quality impairment.

Table 6-1 is a catchment assessment and priority ranking matrix that can be used to document the catchment assessment and priority ranking process.

Table 6-1 CATCHMENT ASSESSMENT AND PRIORITY RANKING MATRIX											
GIS #	Type	Street	Receiving Water Body	Receiving Water Quality (1)	Within Priority area with DCIA > 11%, urbanized, or impaired water body	Discharging To Area of Concern to Public Health (2)	Connectivity level (3)	Density of Generating Sites (4)	Screening Indicated Sewage (5)	System Vulnerability Factor (6)	Priority Ranking (7)
				Poor = 3 Fair = 2 Good = 0	yes (1P) = 2 No (2N) = 0	Yes= 3 No = 0	Fully = 5 Highly = 4 Average = 3 Partially = 2 Slightly = 1	High = 3 Medium = 2 Low = 1	Yes = 3 (Problem Catchment) No = 0	Score = Number of Yes answers in Table 8-1	1 - problem 2 - high priority 3 - low priority 4 - excluded
1-01	1P	Woodstock Avenue	Little River	3	2	0	3	1		1	10 3 - low priority
1-02	1P	Woodstock Avenue	Little River	3	2	0	3	1		1	10 3 - low priority
1-03	1P	Woodstock Ave #1	Little River	3	2	0	3	1		1	10 3 - low priority
2-01	1P	Woodstock Avenue	Little River	3	2	0	3	1		1	10 3 - low priority
2-02	1P	Labossiere Street	Little River	3	2	0	3	1		1	10 3 - low priority
2-03	1P	Latici Street	Wheaton Brook	2	2	0	3	1		1	9 3 - low priority
2-04	1P	Viens Street	Wheaton Brook	2	2	0	3	1		1	9 3 - low priority
2-05	1P	Meyers Street	Wheaton Brook	2	2	0	3	1		1	9 3 - low priority
2-06	1P	Meyers Street	Wheaton Brook	2	2	0	3	1		1	9 3 - low priority
3-01	1P	Bibeault Street	Quinebaug River	2	2	0	3	1		1	9 3 - low priority
3-02	1P	David Circle	Quinebaug River	2	2	0	3	1		1	9 3 - low priority
3-03	1P	David Circle	Quinebaug River	2	2	0	3	1		1	9 3 - low priority
3-04	1P	David Circle	Quinebaug River	2	2	0	3	1		1	9 3 - low priority
3-05	1P	David Circle	Quinebaug River	2	2	0	3	1		1	9 3 - low priority
3-06	1P	Riverside Street	Quinebaug River	2	2	0	3	1		1	9 3 - low priority
3-07	1P	David Circle	Quinebaug River	2	2	0	3	1		1	9 3 - low priority
3-08	1P	Church Street	Quinebaug River	2	2	0	3	1		2	10 3 - low priority
3-09	1P	Auburn Street	Quinebaug River	2	2	0	2	1		1	8 3 - low priority
3-10	1P	Lafayette Street	Quinebaug River	2	2	0	2	1		2	9 3 - low priority
3-11	1P	Dudley Street	Quinebaug River	2	2	0	3	1		2	10 3 - low priority
3-12	1P	Church Street	Quinebaug River	2	2	0	3	1		1	9 3 - low priority
6-01	1P	Sayles Avenue	Little Dam Tavern Brk	0	2	0	2	1		1	6 3 - low priority
6-02	1P	Sayles Avenue	Little Dam Tavern Brk	0	2	0	2	1		1	6 3 - low priority
100-01	1P	Park Road	Quinebaug River	2	2	0	2	3		0	9 3 - low priority
100-02	1P	Park Road	Quinebaug River	2	2	0	2	3		0	9 3 - low priority
100-03	1P	Park Road	Quinebaug River	2	2	0	2	3		0	9 3 - low priority
100-04	1P	Park Road	Quinebaug River	2	2	0	2	3		0	9 3 - low priority
101-01	1P	Ridge Road	Quinebaug River	2	2	0	3	3		0	10 3 - low priority
107-01	1P	Industrial Park Road	Quinebaug River	2	2	0	2	3		0	9 3 - low priority
14-01	1P	Woodstock Ave #1	Little River	3	2	0	3	1		1	10 3 - low priority
15-01	1P	Providence Street	Wheaton Brook	2	2	0	3	3		1	11 2 - high priority
15-04	1P	Woodstock Avenue	Wheaton Brook	2	2	0	3	2		2	11 2 - high priority
15-05	1P	Woodstock Avenue	Wheaton Brook	2	2	0	3	3		2	12 2 - high priority
15-06	1P	Woodstock Avenue	Wheaton Brook	2	2	0	3	3		2	12 2 - high priority
15-08	1P	Wicker Street	Wheaton Brook	2	2	0	3	1		2	10 3 - low priority

Table 6-1 CATCHMENT ASSESSMENT AND PRIORITY RANKING MATRIX												
					Within Priority	Discharging						Priority Ranking (7)
					area with DCIA	To Area of			Previous			1 - problem
			Receiving	Water	> 11%, urbanized, or	Public	Connectivity	Density of	Screening	System		2 - high priority
			Water Body	Quality (1)	impaired water body	Health (2)	level (3)	Sites (4)	Indicated	Vulnerability		3 - low priority
GIS #	Type	Street	Water Body	Quality (1)	impaired water body	Health (2)	level (3)	Sites (4)	Sewage (5)	Factor (6)	Score	4 - excluded
15-09	1P	Bonosconi Drive	Wheaton Brook	2	2	0	2	1		2	9	3 - low priority
15-10	1P	Hurlbut Street	Wheaton Brook	2	2	0	2	1		2	9	3 - low priority
15-11	1P	St. Mary Cemetery	Wheaton Brook	2	2	0	3	1		2	10	3 - low priority
16-03	1P	Providence Street	Quinebaug River	2	2	3	4	2		1	14	2 - high priority
16-04	1P	Toutant hydro	Quinebaug River	2	2	0	3	3		2	12	2 - high priority
16-05	1P	Powhatten Street	Quinebaug River	2	2	0	3	1		1	9	3 - low priority
16-06	1P	Riverside Street	Quinebaug River	2	2	0	2	1		1	8	3 - low priority
16-07	1P	Addison Street Ext.	Quinebaug River	2	2	0	2	1		1	8	3 - low priority
16-08	1P	Addison Street Ext.	Quinebaug River	2	2	0	2	1		1	8	3 - low priority
17-02	1P	School Street	Little Dam Tavern Brk	0	2	0	1	1		0	4	3 - low priority
17-08	1P	Thompson Avenue	Little Dam Tavern Brk	0	2	0	2	1		2	7	3 - low priority
17-09	1P	Thompson Avenue	Little Dam Tavern Brk	0	2	0	2	1		1	6	3 - low priority
17-12	1P	Bates Avenue	Little Dam Tavern Brk	0	2	0	2	1		1	6	3 - low priority
17-13	1P	Groveland Avenue	Quinebaug River	2	2	0	3	1		2	10	3 - low priority
18-07	1P	Pearl Avenue	Little Dam Tavern Brk	0	2	0	2	1		1	6	3 - low priority
19-04	1P	Hawkins Road	Little Dam Tavern Brk	0	2	0	1	1		1	5	3 - low priority
28-01	1P	Sabin Street	Little River	3	2	0	2	1		1	9	3 - low priority
28-02	1P	Sabin Street	Little River	3	2	0	2	1		1	9	3 - low priority
28-03	1P	Wicker Street	Wheaton Brook	2	2	0	2	1		1	8	3 - low priority
28-04	1P	Wicker Street	Wheaton Brook	2	2	0	2	1		1	8	3 - low priority
28-05	1P	Milton Street	Wheaton Brook	2	2	0	3	1		1	9	3 - low priority
28-06	1P	Wicker Street	Wheaton Brook	2	2	0	2	1		1	8	3 - low priority
28-07	1P	South Prospect St	Little River	3	2	0	2	1		1	9	3 - low priority
28-08	1P	Recreation Park Rd	Little River	3	2	0	1	1		1	8	3 - low priority
28-09	1P	Sabin Street	Little River	3	2	0	2	1		1	9	3 - low priority
29-02	1P	Church Street	Quinebaug River	2	2	3	3	2		2	14	2 - high priority
29-03	1P	Recreation Park Rd	Little River	3	2	0	3	1		2	11	2 - high priority
29-04	1P	Kennedy Drive	Quinebaug River	2	2	3	4	1		1	13	2 - high priority
29-05	1P	Kennedy Drive	Quinebaug River	2	2	3	5	1		1	14	2 - high priority
29-06	1P	Kennedy Drive	Quinebaug River	2	2	3	3	1		1	12	2 - high priority
29-07	1P	Kennedy Drive	Quinebaug River	2	2	3	5	2		1	15	2 - high priority
29-08	1P	Church Street	Quinebaug River	2	2	3	3	1		1	12	2 - high priority
29-09	1P	Church Street	Quinebaug River	2	2	3	3	1		1	12	2 - high priority
29-10	1P	Kennedy Drive	Quinebaug River	2	2	3	4	1		1	13	2 - high priority
29-12	1P	Bridge Street	Quinebaug River	2	2	3	3	1		1	12	2 - high priority
29-13	1P	Church Street	Quinebaug River	2	2	0	3	3		1	11	2 - high priority
30-01	1P	Shippee Woods	Little Dam Tavern Brk	0	2	0	3	1		1	7	3 - low priority
30-02	1P	Davis Street	Perry Brook	0	2	0	3	1		2	8	3 - low priority
30-03	1P	Philips Street	Perry Brook	0	2	0	3	1		2	8	3 - low priority

Table 6-1 CATCHMENT ASSESSMENT AND PRIORITY RANKING MATRIX												
					Within Priority	Discharging To Area of			Previous			Priority Ranking (7)
				Receiving	area with DCIA	Concern to		Density of	Screening	System		1 - problem
			Receiving	Water	> 11%, urbanized, or	Public	Connectivity	Generating	Indicated	Vulnerability		2 - high priority
GIS #	Type	Street	Water Body	Quality (1)	impaired water body	Health (2)	level (3)	Sites (4)	Sewage (5)	Factor (6)	Score	3 - low priority 4 - excluded
31-01	1P	Hawkins Road	Little Dam Tavern Brk	0	2	0	3	1		1	7	3 - low priority
31-02	1P	Walnut Street	Little Dam Tavern Brk	0	2	0	2	1		1	6	3 - low priority
31-09	1P	Hawkins Road	Little Dam Tavern Brk	0	2	0	3	1		1	7	3 - low priority
32-01	1P	Hawkins Road	Little Dam Tavern Brk	0	2	0	3	1		1	7	3 - low priority
41-05	1P	Sabin Street	Little River	3	2	0	3	1		1	10	3 - low priority
41-06	1P	Sabin Street	Little River	3	2	0	2	1		2	10	3 - low priority
41-07	1P	Sabin Street	Little River	3	2	0	3	1		3	12	2 - high priority
42-02	1P	Pomfret Street/Rte 44	Quinebaug River	2	2	3	4	2		1	14	2 - high priority
42-05	1P	Pomfret Street/Rte 44	Quinebaug River	2	2	0	4	2		1	11	2 - high priority
42-06	1P	Church Street	Quinebaug River	2	2	0	3	1		1	9	3 - low priority
42-07	1P	Wilkinson Street	Quinebaug River	2	2	0	3	1		1	9	3 - low priority
42-09	1P	Kennedy Drive	Quinebaug River	2	2	3	4	2		2	15	2 - high priority
42-10	1P	Kennedy Drive	Quinebaug River	2	2	3	4	1		2	14	2 - high priority
42-11	1P	Kennedy Drive	Quinebaug River	2	2	3	4	2		1	14	2 - high priority
42-12	1P	Kennedy Drive	Quinebaug River	2	2	3	4	1		1	13	2 - high priority
42-13	1P	Kennedy Drive	Quinebaug River	2	2	3	4	1		1	13	2 - high priority
42-14	1P	Church Street	Quinebaug River	2	2	3	3	1		1	12	2 - high priority
43-01	1P	Flagg Street	Perry Brook	0	2	0	3	1		2	8	3 - low priority
43-02	1P	Flagg Street	Perry Brook	0	2	0	2	1		2	7	3 - low priority
43-03	1P	Florence street	Perry Brook	0	2	0	2	1		1	6	3 - low priority
43-04	1P	Farrows Street	Perry Brook	0	2	0	2	1		0	5	3 - low priority
43-05	1P	Farrows Street	Perry Brook	0	2	0	2	1		0	5	3 - low priority
43-06	1P	Farrows Street	Perry Brook	0	2	0	2	1		0	5	3 - low priority
43-07	1P	Flagg Street	Perry Brook	0	2	0	2	1		1	6	3 - low priority
53-01	1P	Gary School Road	Durkee Brook	0	2	0	1	1		1	5	3 - low priority
55-01	1P	Kennedy Drive	Quinebaug River	2	2	0	3	2		1	10	3 - low priority
55-02	1P	Kennedy Drive	Quinebaug River	2	2	3	3	1		3	14	2 - high priority
55-03	1P	Kennedy Drive	Quinebaug River	2	2	3	3	1		2	13	2 - high priority
55-04	1P	Kennedy Drive	Quinebaug River	2	2	3	3	3		1	14	2 - high priority
55-05	1P	Kennedy Drive	Quinebaug River	2	2	3	3	1		1	12	2 - high priority
55-06	1P	Quinnebaug Ave	Quinebaug River	2	2	3	4	2		1	14	2 - high priority
55-07	1P	Kennedy Drive	Quinebaug River	2	2	3	2	1		1	11	2 - high priority
55-08	1P	Park Street	Quinebaug River	2	2	0	3	1		1	9	3 - low priority
55-09	1P	Kennedy Drive	Quinebaug River	2	2	3	3	2		1	13	2 - high priority
55-10	1P	River Road	Quinebaug River	2	2	0	2	1		1	8	3 - low priority
56-02	1P	South Main Street	Quinebaug River	2	2	0	3	1		1	9	3 - low priority
56-03	1P	South Main Street	Quinebaug River	2	2	0	3	1		1	9	3 - low priority
56-04	1P	Heritage Road	Perry Brook	0	2	0	4	1		1	8	3 - low priority
56-05	1P	Heritage Road	Perry Brook	0	2	0	3	1		1	7	3 - low priority

Table 6-1 CATCHMENT ASSESSMENT AND PRIORITY RANKING MATRIX												
					Within Priority	Discharging						Priority Ranking (7)
					area with DCIA	To Area of			Previous			1 - problem
			Receiving	Water	> 11%, urbanized, or	Public	Connectivity	Density of	Screening	System		2 - high priority
			Water Body	Quality (1)	impaired water body	Health (2)	level (3)	Generating	Indicated	Vulnerability		3 - low priority
GIS #	Type	Street						Sites (4)	Sewage (5)	Factor (6)	Score	4 - excluded
56-06	1P	Heritage Road	Perry Brook	0	2	0	4	1		1	8	3 - low priority
56-08	1P	Memorial Terrace	Perry Brook	0	2	0	3	1		1	7	3 - low priority
67-02	1P	Kelsies Way	Quinebaug River	2	2	0	3	1		0	8	3 - low priority
68-01	1P	River Road	Quinebaug River	2	2	0	1	1		1	7	3 - low priority
68-02	1P	Kennedy Drive	Quinebaug River	2	2	3	4	1		1	13	2 - high priority
69-01	1P	Kennedy Drive	Quinebaug River	2	2	0	4	1		1	10	3 - low priority
69-03	1P	South Main Street	Culver Brook	0	2	0	3	1		1	7	3 - low priority
69-04	1P	South Main Street	Culver Brook	0	2	0	3	1		1	7	3 - low priority
69-05	1P	Kennedy Drive	Quinebaug River	2	2	3	4	1		1	13	2 - high priority
69-06	1P	Kennedy Drive	Quinebaug River	2	2	3	4	1		1	13	2 - high priority
80-02	1P	St. James Place	Quinebaug River	2	2	0	3	1		1	9	3 - low priority
82-01	1P	Park Street	Culver Brook	0	2	0	4	3		1	10	3 - low priority
82-02	1P	Park Street	Culver Brook	0	2	0	4	3		1	10	3 - low priority
82-03	1P	Kennedy Drive	Quinebaug River	2	2	0	4	1		1	10	3 - low priority
82-04	1P	Kennedy Drive	Quinebaug River	2	2	0	4	1		1	10	3 - low priority
82-05	1P	Kennedy Drive	Quinebaug River	2	2	0	4	1		1	10	3 - low priority
82-06	1P	Park Road	Quinebaug River	2	2	0	3	3		1	11	2 - high priority
83-04	1P	Industrial Park Road	Culver Brook	0	2	0	3	3		0	8	3 - low priority
90-01	1P	Modock Road	Durkee Brook	0	2	0	3	1		1	7	3 - low priority
92-01	1P	Park Road	Quinebaug River	2	2	0	3	3		1	11	2 - high priority
92-02	1P	Park Road	Quinebaug River	2	2	0	2	1		1	8	3 - low priority
92-03	1P	Park Road	Quinebaug River	2	2	3	3	3		0	13	2 - high priority
93-02	1P	Industrial Park Road	Quinebaug River	2	2	0	4	3		1	12	2 - high priority
8-01	2N	Thurber Road	Lippitts Brook	0	0	0	3	1		1	5	3 - low priority
8-02	2N	Thurber Road	Lippitts Brook	0	0	0	1	1		1	3	4 - excluded
8-03	2N	Thurber Road	Quinebaug River	2	0	0	1	1		1	5	3 - low priority
8-04	2N	Thurber Road	Lippitts Brook	0	0	0	1	1		1	3	3 - low priority
104-01	2N	River Road	Carpenter Brook	0	0	0	1	1		1	3	4 - excluded
20-02	2N	Mary Crest Drive	Lippitts Brook	0	0	0	3	1		1	5	3 - low priority
21-01	2N	Thurber Road	Lippitts Brook	0	0	0	3	1		1	5	3 - low priority
22-01	2N	Elvira Heights	Munson Brook	0	0	0	3	1		1	5	3 - low priority
22-02	2N	Elvira Heights	Munson Brook	0	0	0	2	1		1	4	3 - low priority
22-03	2N	Elvira Heights	Munson Brook	0	0	0	3	1		1	5	3 - low priority
22-04	2N	Elvira Heights	Munson Brook	0	0	0	2	1		1	4	3 - low priority
31-03	2N	Walnut Road	Perry Brook	0	0	0	3	1		1	5	3 - low priority
31-04	2N	Walnut Street	Perry Brook	0	0	0	3	1		1	5	3 - low priority
31-05	2N	Walnut Street	Perry Brook	0	0	0	3	1		1	5	3 - low priority
31-06	2N	Walnut Street	Perry Brook	0	0	0	3	1		1	5	3 - low priority
31-07	2N	Walnut Road	Perry Brook	0	0	0	2	1		1	4	3 - low priority

Table 6-1 CATCHMENT ASSESSMENT AND PRIORITY RANKING MATRIX												
GIS #	Type	Street	Receiving Water Body	Receiving Water Quality (1)	Within Priority area with DCIA > 11%, urbanized, or impaired water body	Discharging To Area of Concern to Public Health (2)	Connectivity level (3)	Density of Generating Sites (4)	Screening Indicated Sewage (5)	Previous System Vulnerability Factor (6)	Score	Priority Ranking (7)
												1 - problem
												2 - high priority
												3 - low priority
												4 - excluded
31-08	2N	Walnut Road	Perry Brook	0	0	0	2	1		1	4	3 - low priority
31-10	2N	Walnut Road	Perry Brook	0	0	0	2	1		1	4	3 - low priority
46-01	2N	Aldrich Road	Tavern Brk Pond No1	0	0	0	3	1		1	5	3 - low priority
57-01	2N	Shepards Lane	Perry Brook	0	0	0	3	1		1	5	3 - low priority
57-02	2N	Heritage Road	Perry Brook	0	0	0	3	1		1	5	3 - low priority
57-03	2N	Heritage Road	Perry Brook	0	0	0	3	1		1	5	3 - low priority
57-04	2N	Heritage Road	Perry Brook	0	0	0	3	1		1	5	3 - low priority
58-01	2N	Heritage Road	Culver Brook	0	0	0	3	1		2	6	3 - low priority
58-02	2N	Heritage Road	Culver Brook	0	0	0	3	1		2	6	3 - low priority
58-03	2N	Heritage Road	Culver Brook	0	0	0	3	1		2	6	3 - low priority
63-01	2N	Brookside Landing	Cady Brook	0	0	0	2	1		1	4	3 - low priority
71-01	2N	Heritage Road	Culver Brook	0	0	0	3	1		2	6	3 - low priority
72-03	2N	Five Mile River Road	Tavern Brk Pond No1	0	0	0	2	1		1	4	3 - low priority
72-04	2N	Five Mile River Road	Tavern Brk Pond No1	0	0	0	2	1		2	5	3 - low priority
72-05	2N	5 Mile River Road	Tavern Brk Pond No1	0	0	0	2	1		2	5	3 - low priority
75-01	2N	River Junction Estates	Five Mile River	0	0	0	2	1		0	3	3 - low priority
75-02	2N	River Junction Estates	Five Mile River	0	0	0	2	1		0	3	3 - low priority
76-01	2N	Chase Road	Five Mile River	0	0	0	2	1		1	4	3 - low priority
80-01	2N	Mantup Road	Carpenter Brook	0	0	0	2	1		2	5	3 - low priority
83-02	2N	Killingly Ave/Rte 12	Culver Brook	0	0	0	2	1		1	4	3 - low priority
83-05	2N	Industrial Park Road	Culver Brook	0	0	0	3	2		0	5	3 - low priority
83-06	2N	Highland Drive	Culver Brook	0	0	0	3	3		1	7	3 - low priority
84-01	2N	Hurry Hill Road	Culver Brook	0	0	0	3	1		2	6	3 - low priority
84-02	2N	DeCubellis Court	Culver Brook	0	0	0	3	1		1	5	3 - low priority
84-03	2N	Paula Road	Culver Brook	0	0	0	3	1		1	5	3 - low priority
93-01	2N	Highland Drive	Culver Brook	0	0	0	3	3		1	7	3 - low priority
94-02	2N	Killingly Ave/Rte 12	Labonte Pond	0	0	0	2	1		1	4	3 - low priority
94-03	2N	Pierce Road	LaBonte Pond	0	0	0	2	1		1	4	3 - low priority
94-04	2N	Pierce Road	LaBonte Pond	0	0	0	2	1		2	5	3 - low priority
95-01	2N	Aspinock Road	Aspinock Brook	0	0	0	2	1		1	4	3 - low priority
Colors:												
Orange= interconnected municipal/State drainage System												
Abbrevi:												
Type: 1P = Priority catchment due to urbanized area, impaired water body of DCIA >11%												
2N = not a priority catchment												
DCIA = directly connected impervious area												
SSO = Sanitary Sewer Overflow												

Table 6-1 CATCHMENT ASSESSMENT AND PRIORITY RANKING MATRIX											
GIS #	Type	Street	Receiving Water Body	Receiving Water Quality (1)	Within Priority area with DCIA > 11%, urbanized, or impaired water body	Discharging To Area of Concern to Public Health (2)	Connectivity level (3)	Density of Generating Sites (4)	Screening Indicated Sewage (5)	System Vulnerability Factor (6)	Priority Ranking (7)
											1 - problem
											2 - high priority
											3 - low priority
											4 - excluded
SVF= System Vulnerability Factor											
Sources: GIS Maps, Catchment inspections & Sample Results, Municipal Staff, CT DEEP, Impaired waters list, Visual Observation, Aerial Photography, NDDH Staff											
SCORING CRITERIA											
(1) Receiving water quality based on latest version of State of Connecticut Integrated Water Quality Report.											
<ul style="list-style-type: none"> • 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 • Fair = Water quality limited waterbodies that receive a discharge from the MS4 (Category 5 waters) • Good = No water quality impairments 											
(2) Catchments that discharge to or in the vicinity of any of the following areas: public beaches, recreational areas, drinking water supplies, or shellfish beds											
In Putnam this consists of outfalls within 200' of the Little River north of Recreation Park Rd, within 200' of the Quinebaug River between Providence Street and											
Carpenter Brook, and within 500' of the Park Road well field											
(3) Connectivity Level for DCIA calculations using Option 2:											
5 - Fully Connected, 100% storm sewered with all IC, DCIA % = IC%											
4 - Highly Connected, mostly storm sewered with curb and gutter, residential rooftops connected to MS4, DCIA% = 0.4(%IC)^1.2											
3 - Average, Mostly storm sewered with curb and gutter, residential rooftops NOT connected to MS4, DCIA% = 0.1(%IC)^1.5											
2 - Partially Connected, 50% storm sewered with some infiltration and residential rooftops not connected to MS4, DCIA% =0.04(%IC)^1.7											
1 - Slightly Connected, small % of urban storm sewered or mostly infiltration, DCIA%=0.01(IC%)^2											
(4) Generating sites are institutional, municipal, commercial, or industrial sites with a potential to contribute to illicit discharges (e.g., car dealers, car washes, gas stations, garden centers, industrial manufacturing, etc.)											
(5) Previous screening results indicate likely sewer input if any of the following are true:											
<ul style="list-style-type: none"> • 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, or • Ammonia ≥ 0.5 mg/L, surfactants ≥0.25 mg/L, and detectable levels of chlorine 											
(6) System vulnerability factors include the following six factors:											
<ul style="list-style-type: none"> • History of SSO's • Increased potential for SSO's due to common trench construction, storm/sanitary pipe crossings where sanitary system is above the storm drain system, sanitary sewer alignments constructed with underdrains, inadequate sewer line capacity. • Sanitary Infrastructure Defects • Sanitary and Stormdrain Infrastructure > 40 years old • History of NDDH Actions Addressing Septic Failure • Septic systems in areas with limited suitability for subsurface sewage disposal such as small lots, high groundwater, shallow ledge, etc. 											
These factors are summarized in Table 8-1, outfall catchment system vulnerability factor (SVF) inventory.											

Table 6-1 CATCHMENT ASSESSMENT AND PRIORITY RANKING MATRIX													
					Within Priority	Discharging To Area of			Previous				Priority Ranking (7)
				Receiving	area with DCIA	Concern to		Density of	Screening	System			1 - problem
			Receiving	Water	> 11%, urbanized, or	Public	Connectivity	Generating	Indicated	Vulnerability			2 - high priority
GIS #	Type	Street	Water Body	Quality (1)	impaired water body	Health (2)	level (3)	Sites (4)	Sewage (5)	Factor (6)	Score		3 - low priority
	(7) Priority Ranking:												4 - excluded
	1- Problem Catchments: catchments with known or suspected contributions of illicit discharges based on existing information. Problem catchments must be scheduled for catchment investigations												
	2- High Priority: Catchments that have not been classified as problem catchments that discharge to an area of concern to public health or have a score greater than 10												
	3 - Low Priority: Catchments that have a score between 3 And 10												
	4 - Excluded: Catchments with no potential for illicit discharges due to undeveloped areas without dwellings or serews or athletic fields or undeveloped green spaces												

7 Outfall and Interconnection Screening and Sampling – BMP 5d

The 2017 MS4 Permit requires screening and sampling of outfalls and interconnections from the MS4 in dry and wet weather for evidence of illicit discharges and SSOs, including:

- Baseline outfall and interconnection screening (dry weather)
- Confirmatory screenings (dry and/or wet weather depending on catchment characteristics)
- Follow-up screening (dry and/or wet weather depending on catchment characteristics).

The **##AGENCY OR DEPARTMENT** is responsible for conducting dry and wet weather outfall and interconnection screening and sampling.

7.1 Dry and Wet Weather Rainfall Criteria

For the purposes of outfall screening and sampling, dry and wet weather conditions are defined as follows:

- **Dry Weather** – dry weather screening and sampling shall proceed when no more than 0.1 inches of rainfall has occurred in the previous 24-hour period.
- **Wet Weather** – wet weather screening and sampling shall occur during or after a storm event of sufficient depth or intensity to produce a stormwater discharge at the outfall. There is no specific rainfall amount that will trigger sampling, although minimum storm event intensities that are likely to trigger sanitary sewer interconnections are preferred. Sampling during the initial period of discharge (“first flush”) will be avoided. To the extent feasible, sampling should occur during the spring (March through June) when groundwater levels are relatively high.

Note that wet weather criteria for impaired waters outfall monitoring pursuant to Section 6(i) of the MS4 Permit are different than the above wet weather criteria for outfall screening and sampling.

For purposes of determining dry and wet weather conditions, precipitation data from Weather Underground (<https://www.wunderground.com/history/airport/KIJD/2013/05/31/DailyHistory.html>) for Windham Airport will be used. If Windham Airport is not available or not reporting current weather data, then data from T.F. Green Airport will be used as a back-up.

The remainder of this section is focused on dry weather screening and sampling. Wet weather screening and sampling is discussed further in the context of catchment investigations, including confirmatory and followup screening in Section 8.

7.2 Dry Weather Screening/Sampling

Instructions: The dry weather screening and sampling procedures described in this section are based on the requirements outlined in the 2017 MS4 Permit. The CMRSWC “SOP1: Dry Weather Outfall Inspection” provides additional suggestions for carrying out a screening/sampling program. http://centralmastormwater.org/Pages/crsc_toolbox/Dry%20Outfall%20Inspection%20SOP%20and%20Form_Final.pdf. Municipalities should include example Sample Labels, Field Sheets and Chain of Custody forms in the appendices of this written IDDE program.

Dry weather flow is a common indicator of potential illicit connections. The 2017 MS4 Permit requires all outfalls/interconnections (excluding Problem and Excluded Catchments) to be screened (i.e., visually inspected) for the presence of dry weather flow. Dry weather outfall screening and sampling may take place when no more than 0.1 inches of rainfall has occurred in the previous 24-hour period.

7.2.1 General Procedure

The dry weather outfall screening and sampling procedure consists of the following general steps:

1. Identify outfall(s) to be screened/sampled based on outfall inventory and initial catchment priority ranking.
2. Acquire the necessary ~~staff~~, mapping, and field equipment (see **Table 7-1** for list of potential field equipment). The town has no funding to hire additional staff for this task. **Existing employees will be re-assigned.**
3. Conduct the outfall inspection during dry weather:
 - a. Mark and photograph the outfall.
 - b. Record the inspection information and outfall characteristics (using paper forms or digital form using a tablet or similar device) (see form in **Appendix C**).
 - c. Look for and record visual/olfactory evidence of pollutants in flowing outfalls including odor, color, turbidity, and floatable matter (suds, bubbles, excrement, toilet paper or sanitary products). Also observe outfalls for deposits and stains, vegetation, and damage to outfall structures.
4. If an outfall is inaccessible or submerged, proceed to the first accessible upstream manhole or structure for the observation and sampling and report the location with the screening results. If an interconnection is inaccessible or submerged, perform screening at the first accessible location within the permittee’s system upgradient of the interconnection.
5. If flow is observed, sample and test the flow following the procedures described in the following sections.
6. If no flow is observed, but evidence illicit discharges exists (illicit discharges are often intermittent or transitory), 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. Other techniques can be used to detect intermittent or transitory flows including conducting inspections during evenings or weekends and using optical brighteners.
7. Input results from screening and sampling into spreadsheet/database. Include pertinent information in the outfall/interconnection inventory and priority ranking.
8. Include all screening data in the annual report.

7.2.2 Field Equipment

Table 7-1 lists field equipment commonly used for dry weather outfall screening and sampling. This list is recommended by DEEP and has not been independently verified by J & D Civil Engineers.

Table 7-1. Field Equipment – Dry Weather Outfall Screening and Sampling

Equipment	Use/Notes
Clipboard	For organization of field sheets and writing surface
Field Sheets	Field sheets for both dry weather inspection and Dry weather sampling should be available with extras
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 and boots at a minimum
GPS Receiver	For taking spatial location data
Water Quality Sonde	If needed, for sampling conductivity, temperature, pH
Water Quality Meter	Hand held meter, if available, for testing for 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. 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 requires sterile containers).
Pry Bar or Pick	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
Safety Cones	Safety
Hand Sanitizer	Disinfectant/decontaminant
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

7.2.3 Sample Collection and Analysis

If flow is present during a dry weather outfall inspection, a sample will be collected and analyzed for the required permit parameters³ listed in **Table 7-2**. The general procedure for collection of outfall samples is as follows:

1. Fill out all sample information on sample bottles and field sheets (see **Appendix C** for Sample Labels and Field Sheets)
2. Put on protective gloves (nitrile/latex/other) before sampling
3. Collect sample with dipper or directly in sample containers. If possible, collect water from the flow directly in the sample bottle. Be careful not to disturb sediments.
4. If using a dipper or other device, triple rinse the device with distilled water and then in water to be sampled (not for bacteria sampling)
5. Use test strips, test kits, and field meters (rinse similar to dipper) for most parameters (see **Table 7-2**)
6. Place laboratory samples on ice for analysis of bacteria and pollutants of concern
7. Fill out chain-of-custody form (**Appendix C**) for laboratory samples
8. Deliver samples to the laboratory
9. Dispose of used test strips and test kit ampules properly
10. Decontaminate all testing personnel and equipment

Field test kits or field instrumentation are permitted for all parameters except indicator bacteria and any pollutants of concern. Field kits need to have appropriate detection limits and ranges. **Table 7-2** lists various field test kits and field instruments that can be used for outfall sampling associated with the 2017 MS4 Permit parameters, other than indicator bacteria and any pollutants of concern. Analytical procedures and user's manuals for field test kits and field instrumentation are provided in **Appendix D**.

Instructions: The following table lists possible field meters and test kits that may be used to meet the dry weather screening and sampling requirements outlined in the 2017 MS4 Permit. Additional information is available on the UConn CLEAR MS4 Permit website:
<http://nemo.uconn.edu/ms4/implement/monitoring.htm>

³ Other potentially useful parameters, although not required by the MS4 Permit, include **fluoride** (indicator of potable water sources in areas where water supplies are fluoridated), **potassium** (high levels may indicate the presence of sanitary wastewater), and **optical brighteners** (indicative of laundry detergents).

Table 7-2. Outfall Screening Sampling Parameters and Analysis Methods

Analyte or Parameter	Instrumentation (Portable Meter)	Field Test Kit
Ammonia	CHEMetrics™ V-2000 Colorimeter Hach™ DR/890 Colorimeter Hach™ Pocket Colorimeter™ II	CHEMetrics™ K-1410 CHEMetrics™ K-1510 (series) Hach™ NI-SA Hach N1-8 Hach™ Ammonia Test Strips
Surfactants (Detergents)	CHEMetrics™ I-2017	CHEMetrics™ K-9400 and K-9404 Hach™ DE-2
Chlorine	CHEMetrics™ V-2000, K-2513 Hach™ Pocket Colorimeter™ II	Hach CN-66F
Conductivity	CHEMetrics™ I-1200 YSI Pro30 YSI EC300A Oakton 450	NA
Temperature	YSI Pro30 YSI EC300A Oakton 450	NA
Salinity	YSI Pro30 YSI EC300A Oakton 450	NA
Temperature	YSI Pro30 YSI EC300A Oakton 450	NA
Indicator Bacteria: <i>E. coli</i> (freshwater) or Enterococcus (saline water)	EPA certified laboratory procedure (40 CFR § 136)	NA
Pollutants of Concern ¹	EPA certified laboratory procedure (40 CFR § 136)	NA

¹ Where the discharge is directly into a water quality limited water or a water 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.

Testing for indicator bacteria and any pollutants of concern must be conducted using analytical methods and procedures found in 40 CFR § 136.⁴ Samples for laboratory analysis must also be stored and preserved in accordance with procedures found in 40 CFR § 136. **Table 7-3** lists analytical methods, detection limits, hold times, and preservatives for laboratory analysis of dry weather sampling parameters.

⁴ 40 CFR § 136: <http://www.ecfr.gov/cgi-bin/text-idx?SID=b3b41fdea0b7b0b8cd6c4304d86271b7&mc=true&node=pt40.25.136&rgn=div5>

Instructions: Include in the following table the appropriate highlighted indicator bacteria parameter(s) – E. coli for freshwater and Enterococcus for saltwater – and applicable pollutants of concern for outfalls that discharge directly into impaired waters or waters subject to an approved TMDL.

Table 7-3. Required Analytical Methods, Detection Limits, Hold Times, and Preservatives

Analyte or Parameter	Analytical Method	Detection Limit	Max. Hold Time	Preservative
Ammonia	EPA: 350.2, SM: 4500-NH ₃ C	0.05 mg/L	28 days	Cool ≤6°C, H ₂ SO ₄ to pH <2, No preservative required if analyzed immediately
Surfactants	SM: 5540-C	0.01 mg/L	48 hours	Cool ≤6°C
Chlorine	SM: 4500-Cl G	0.02 mg/L	Analyze within 15 minutes	None Required
Temperature	SM: 2550B	NA	Immediate	None Required
Specific Conductance	EPA: 120.1, SM: 2510B	0.2 µs/cm	28 days	Cool ≤6°C
Salinity	SM: 2520	-	28 days	Cool ≤6°C
Indicator Bacteria: <i>E.coli</i> (freshwater) <i>Enterococcus</i> (saltwater)	<i>E.coli</i> EPA: 1603 SM: 9221B, 9221F, 9223 B Other: Colilert®, Colilert-18®	<i>E.coli</i> EPA: 1 cfu/100mL SM: 2 MPN/100mL Other: 1 MPN/100mL	6 hours	Cool ≤6°C, 0.0008% Na ₂ S ₂ O ₃ (sodium thiosulfate)
Total Phosphorus (Pollutant of Concern)	EPA: Manual-365.3, Automated Ascorbic acid digestion-365.1 Rev. 2, ICP/AES4-200.7 Rev. 4.4 SM: 4500-P E-F	EPA: 0.01 mg/L SM : 0.01 mg/L	28 days	Cool ≤6°C, H ₂ SO ₄ to pH <2
Total Nitrogen (Pollutant of Concern) (Ammonia + Nitrate/Nitrite, methods are for Nitrate-Nitrite and need to be combined with Ammonia listed above.)	EPA: Cadmium reduction (automated)-353.2 Rev. 2.0, SM: 4500-NO ₃ E-F	EPA: 0.05 mg/L SM : 0.05 mg/L	28 days	Cool ≤6°C, H ₂ SO ₄ to pH <2

EPA = EPA Methods SM = Standard Methods

7.3 Interpreting Outfall Sampling Results

Outfall analytical data can be used to help identify the major type or source of discharge. **Table 7-4** shows values identified by the U.S. EPA and the Center for Watershed Protection as typical screening values for select parameters. These represent the typical concentration (or value) of each parameter expected to be found in stormwater. Screening values that exceed these benchmarks may be indicative of pollution and/or illicit discharges.

Table 7-4. Benchmark Field Measurements for Select Parameters

Analyte or Parameter	Benchmark
Ammonia	>0.5 mg/L
Conductivity	>2,000 μ S/cm
Surfactants	>0.25 mg/L
Chlorine	>0.02 mg/L (detectable levels per the 2017 MS4 Permit)
Indicator Bacteria <i>E.coli</i> (freshwater)	<i>E.coli</i> : the geometric mean of the five most recent samples taken during the same bathing season shall not exceed 126 colonies per 100 ml and no single sample taken during the bathing season shall exceed 235 colonies per 100 ml for designated swimming areas, 410 colonies per 100 ml for non-designated swimming areas, and 576 colonies per 100 ml for all other uses.

Catchments are considered highly likely to contain illicit discharges from sanitary sources when either of the following combinations of sampling results is detected:

- Ammonia \geq 0.5 mg/L, surfactants \geq 0.25 mg/L, and bacteria levels greater than the water quality criteria applicable to the receiving water, or
- Ammonia \geq 0.5 mg/L, surfactants \geq 0.25 mg/L, and detectable levels of chlorine.

Catchments with outfall screening results that meet the above criteria shall be ranked at the top of the High Priority Catchments category for investigation.

8 Catchment Investigations BMP 5e

Once stormwater outfalls with evidence of illicit discharges have been identified, various methods can be used to investigate the source of the potential discharge within the outfall catchment area. Common catchment investigation techniques include, but are not limited to:

- Review of maps, historic plans, and records
- Manhole inspection
- Dry and wet weather sampling
- Video inspection
- Smoke testing
- Dye testing.

This section outlines a systematic procedure to investigate outfall catchments and identify the source(s) of potential illicit discharges. Information and data collected as part of the catchment investigations will be reported in each annual report.

8.1 System Vulnerability Factors

The **##AGENCY OR DEPARTMENT** will review relevant mapping and historic plans and records to identify areas within the catchment with higher potential for illicit connections. The following information will be reviewed:

- Plans related to the construction of the drainage network
- Prior work on the storm drains
- **NDDH** data on septic system failures or required upgrades
- Records related to septic system breakouts, SSOs, and sanitary sewer surcharges **as compiled in Table 5.1 above.**

Based on the review of this information, the presence of any of the following **System Vulnerability Factors (SVFs)** will be identified for each catchment. SVFs indicate a risk of sanitary or septic system inputs to the MS4 under wet weather conditions.

- History of SSOs, including, but not limited to, those resulting from wet weather, high water table, or fat/oil/grease blockages.
- Sewer pump/lift stations, siphons, or known sanitary sewer restrictions where power/equipment failures or blockages could readily result in SSOs.
- Inadequate sanitary sewer level of service (LOS) resulting in regular surcharging, customer back-ups, or frequent customer complaints.
- Crossings of storm and sanitary sewer alignments **where the storm sewer is known to be deep and/or below the sanitary sewer**
- Sanitary sewer alignments known or suspected to have been constructed with an underdrain system.
- Sanitary sewer infrastructure defects such as leaking service laterals, cracked, broken, or offset sanitary infrastructure, directly piped connections between storm drain and sanitary sewer

infrastructure, or other vulnerability factors identified through Inflow/Infiltration Analyses, Sanitary Sewer Evaluation Surveys, or other infrastructure investigations.

- Any storm drain infrastructure greater than 40 years old in medium and densely developed areas.

A SVF inventory will be documented for each catchment (see **Table 8-1**), retained as part of this written IDDE program, and included in the annual report.

Table 8-1 OUTFALL CATCHMENT SYSTEM VULNERABILITY FACTOR (SVF) INVENTORY								
						Sanitary and	Septic	System
			History	Increased	Sanitary	Stormdrain	System	Vulnerability Factor
		Receiving	of	SSO	Infrastructure	Infrastructure	Areas of	SVF Score =
GIS #	Street	Water Body	SSO's (1)	Potential (2)	Defects (3)	> 40 years old (4)	Concern (5)	number of Yes Answers
1-01	Woodstock Avenue	Little River	No	No	No	Yes	N/A	1
1-02	Woodstock Avenue	Little River	No	No	No	Yes	N/A	1
1-03	Woodstock Ave #1	Little River	No	No	No	Yes	N/A	1
2-01	Woodstock Avenue	Little River	No	No	No	No	N/A	1
2-02	Labossiere Street	Little River	No	No	No	No	N/A	1
2-03	Latici Street	Wheaton Brook	No	No	No	Yes	N/A	1
2-04	Viens Street	Wheaton Brook	No	No	No	Yes	N/A	1
2-05	Meyers Street	Wheaton Brook	No	No	No	Yes	N/A	1
2-06	Meyers Street	Wheaton Brook	No	No	No	Yes	N/A	1
3-01	Bibeault Street	Quinebaug River	No	No	No	Yes	N/A	1
3-02	David Circle	Quinebaug River	No	No	No	Yes	N/A	1
3-03	David Circle	Quinebaug River	No	No	No	Yes	N/A	1
3-04	David Circle	Quinebaug River	No	No	No	Yes	N/A	1
3-05	David Circle	Quinebaug River	No	No	No	Yes	N/A	1
3-06	Riverside Street	Quinebaug River	No	No	No	Yes	N/A	1
3-07	David Circle	Quinebaug River	No	No	No	Yes	N/A	1
3-08	Oxford Street	Quinebaug River	N/A	N/A	N/A	Yes	Yes	2
3-09	Auburn Street	Quinebaug River	No	No	No	Yes	N/A	1
3-10	Lafayette Street	Quinebaug River	N/A	N/A	N/A	Yes	Yes	2
3-11	Dudley Street	Quinebaug River	N/A	N/A	N/A	Yes	Yes	2
3-12	Church Street	Quinebaug River	No	No	No	Yes	N/A	1
6-01	Sayles Avenue	Little Dam Tavern Brk	No	N/A	N/A	Yes	No	1
6-02	Sayles Avenue	Little Dam Tavern Brk	No	N/A	N/A	Yes	No	1
100-01	Park Road	Quinebaug River	No	No	No	No	N/A	0
100-02	Park Road	Quinebaug River	No	No	No	No	N/A	0
100-03	Park Road	Quinebaug River	No	No	No	No	N/A	0
100-04	Park Road	Quinebaug River	No	No	No	No	N/A	0
101-01	Ridge Road	Quinebaug River	No	No	No	No	N/A	0
107-01	Park Road	Quinebaug River	No	N/A	N/A	No	No	0
14-01	Woodstock Ave #1	Little River	No	No	No	Yes	N/A	1
15-01	Providence Street	Wheaton Brook	No	No	No	Yes	N/A	1
15-04	Woodstock Avenue	Wheaton Brook	No	No	Yes	Yes	N/A	2
15-05	Woodstock Avenue	Wheaton Brook	No	No	No	Yes	N/A	2
15-06	Woodstock Avenue	Wheaton Brook	No	No	No	Yes	N/A	2

Table 8-1 OUTFALL CATCHMENT SYSTEM VULNERABILITY FACTOR (SVF) INVENTORY								
						Sanitary and	Septic	System
			History	Increased	Sanitary	Stormdrain	System	Vulnerability Factor
		Receiving	of	SSO	Infrastructure	Infrastructure	Areas of	SVF Score =
GIS #	Street	Water Body	SSO's (1)	Potential (2)	Defects (3)	> 40 years old (4)	Concern (5)	number of
								Yes Answers
15-08	Wicker Street	Wheaton Brook	No	No	No	Yes	N/A	2
15-09	Bonosconi Drive	Wheaton Brook	No	No	No	Yes	N/A	2
15-10	Hurlbut Street	Wheaton Brook	No	No	No	Yes	N/A	2
15-11	St. Mary Cemetery	Wheaton Brook	Yes	No	No	Yes	N/A	2
16-03	Providence Street	Quinebaug River	No	No	No	Yes	N/A	1
16-04	Toutant hydro	Quinebaug River	No	No	Yes	Yes	N/A	2
16-05	Powhatten Street	Quinebaug River	No	No	No	Yes	N/A	1
16-06	Riverside Street	Quinebaug River	No	No	No	Yes	N/A	1
16-07	Addison Street Ext.	Quinebaug River	No	No	No	Yes	N/A	1
16-08	Addison Street Ext.	Quinebaug River	No	No	No	Yes	N/A	1
17-02	School Street	Little Dam Tavern Brk	No	No	No	No	N/A	0
17-08	Thompson Avenue	Little Dam Tavern Brk	Yes	No	No	Yes	N/A	2
17-09	Thompson Avenue	Little Dam Tavern Brk	No	No	No	Yes	N/A	1
17-12	Bates Avenue	Little Dam Tavern Brk	No	No	No	Yes	N/A	1
17-13	Groveland Avenue	Quinebaug River	Yes	No	No	Yes	N/A	2
18-07	Pearl Avenue	Little Dam Tavern Brk	No	No	No	Yes	N/A	1
19-04	Hawkins Road	Little Dam Tavern Brk	No	N/A	N/A	Yes	No	1
28-01	Sabin Street	Little River	No	No	No	Yes	N/A	1
28-02	Sabin Street	Little River	No	No	No	Yes	N/A	1
28-03	Wicker Street	Wheaton Brook	No	No	No	Yes	N/A	1
28-04	Wicker Street	Wheaton Brook	No	No	No	Yes	N/A	1
28-05	Milton Street	Wheaton Brook	No	No	No	Yes	N/A	1
28-06	Wicker Street	Wheaton Brook	No	No	No	Yes	N/A	1
28-07	South Prospect St	Little River	No	No	No	Yes	N/A	1
28-08	Recreation Park Rd	Little River	No	No	No	Yes	N/A	1
28-09	Sabin Street	Little River	No	No	No	Yes	N/A	1
29-02	Church Street	Quinebaug River	Yes	No	No	Yes	N/A	2
29-03	Recreation Park Rd	Little River	No	No	Yes	Yes	N/A	2
29-04	Kennedy Drive	Quinebaug River	No	No	No	Yes	N/A	1
29-05	Kennedy Drive	Quinebaug River	No	No	No	Yes	N/A	1
29-06	Kennedy Drive	Quinebaug River	No	No	No	Yes	N/A	1
29-07	Kennedy Drive	Quinebaug River	No	No	No	Yes	N/A	1
29-08	Church Street	Quinebaug River	No	No	No	Yes	N/A	1
29-09	Church Street	Quinebaug River	No	No	No	Yes	N/A	1

Table 8-1 OUTFALL CATCHMENT SYSTEM VULNERABILITY FACTOR (SVF) INVENTORY								
						Sanitary and	Septic	System
			History	Increased	Sanitary	Stormdrain	System	Vulnerability Factor
		Receiving	of	SSO	Infrastructure	Infrastructure	Areas of	SVF Score =
GIS #	Street	Water Body	SSO's (1)	Potential (2)	Defects (3)	> 40 years old (4)	Concern (5)	number of
								Yes Answers
29-10	Kennedy Drive	Quinebaug River	No	No	No	Yes	N/A	1
29-12	Bridge Street	Quinebaug River	No	No	No	Yes	N/A	1
29-13	Church Street	Quinebaug River	No	No	No	Yes	N/A	1
30-01	Shippee Woods	Little Dam Tavern Brk	No	N/A	N/A	Yes	No	1
30-02	Davis Street	Perry Brook	Yes	No	No	Yes	N/A	2
30-03	Philips Street	Perry Brook	No	No	Yes	Yes	N/A	2
31-01	Hawkins Road	Little Dam Tavern Brk	No	N/A	N/A	Yes	No	1
31-02	Walnut Street	Little Dam Tavern Brk	No	N/A	N/A	Yes	No	1
31-09	Hawkins Road	Little Dam Tavern Brk	No	N/A	N/A	Yes	No	1
32-01	Hawkins Road	Little Dam Tavern Brk	No	N/A	N/A	Yes	No	1
41-05	Sabin Street	Little River	No	No	No	Yes	N/A	1
41-06	Sabin Street	Little River	Yes	No	No	Yes	N/A	2
41-07	Sabin Street	Little River	Yes	No	Yes	Yes	N/A	3
42-02	Pomfret Street/Rte 44	Quinebaug River	No	No	No	Yes	N/A	1
42-05	Pomfret Street/Rte 44	Quinebaug River	No	No	No	Yes	N/A	1
42-06	Church Street	Quinebaug River	No	No	No	Yes	N/A	1
42-07	Wilkinson Street	Quinebaug River	No	No	No	Yes	N/A	1
42-09	Kennedy Drive	Quinebaug River	No	No	Yes	Yes	N/A	2
42-10	Kennedy Drive	Quinebaug River	Yes	No	No	Yes	N/A	2
42-11	Kennedy Drive	Quinebaug River	No	No	No	Yes	N/A	1
42-12	Kennedy Drive	Quinebaug River	No	No	No	Yes	N/A	1
42-13	Kennedy Drive	Quinebaug River	No	No	No	Yes	N/A	1
42-14	Church Street	Quinebaug River	No	No	No	Yes	N/A	1
43-01	Flagg Street	Perry Brook	No	No	Yes	Yes	N/A	2
43-02	Flagg Street	Perry Brook	No	No	Yes	Yes	N/A	2
43-03	Florence street	Perry Brook	No	No	No	Yes	N/A	1
43-04	Farrows Street	Perry Brook	No	No	No	No	N/A	0
43-05	Farrows Street	Perry Brook	No	No	No	No	N/A	0
43-06	Farrows Street	Perry Brook	No	No	No	No	N/A	0
43-07	Flagg Street	Perry Brook	No	No	No	Yes	N/A	1
53-01	Gary School Road	Durkee Brook	No	N/A	N/A	Yes	No	1
55-01	Kennedy Drive	Quinebaug River	No	No	No	Yes	N/A	1
55-02	Kennedy Drive	Quinebaug River	Yes	No	Yes	Yes	N/A	3
55-03	Kennedy Drive	Quinebaug River	Yes	No	No	Yes	N/A	2

Table 8-1 OUTFALL CATCHMENT SYSTEM VULNERABILITY FACTOR (SVF) INVENTORY								
						Sanitary and	Septic	System
			History	Increased	Sanitary	Stormdrain	System	Vulnerability Factor
		Receiving	of	SSO	Infrastructure	Infrastructure	Areas of	SVF Score =
GIS #	Street	Water Body	SSO's (1)	Potential (2)	Defects (3)	> 40 years old (4)	Concern (5)	number of
								Yes Answers
55-04	Kennedy Drive	Quinebaug River	No	No	No	Yes	N/A	1
55-05	Kennedy Drive	Quinebaug River	No	No	No	Yes	N/A	1
55-06	Quinnebaug Ave	Quinebaug River	No	No	No	Yes	N/A	1
55-07	Kennedy Drive	Quinebaug River	No	No	No	Yes	N/A	1
55-08	Park Street	Quinebaug River	No	No	No	Yes	N/A	1
55-09	Kennedy Drive	Quinebaug River	No	No	No	Yes	N/A	1
55-10	River Road	Quinebaug River	No	No	No	Yes	N/A	1
56-02	South Main Street	Quinebaug River	No	No	No	Yes	N/A	1
56-03	South Main Street	Quinebaug River	No	No	No	Yes	N/A	1
56-04	Heritage Road	Perry Brook	No	No	No	Yes	N/A	1
56-05	Heritage Road	Perry Brook	No	No	No	Yes	N/A	1
56-06	Heritage Road	Perry Brook	No	No	No	Yes	N/A	1
56-08	Memorial Terrace	Perry Brook	No	No	No	Yes	N/A	1
67-02	Kelsies Way	Quinebaug River	No	N/A	N/A	No	No	0
68-01	River Road	Quinebaug River	No	N/A	N/A	Yes	No	1
68-02	Kennedy Drive	Quinebaug River	No	N/A	N/A	Yes	No	1
69-01	Kennedy Drive	Quinebaug River	No	No	No	Yes	No	1
69-03	South Main Street	Culver Brook	No	No	No	Yes	N/A	1
69-04	South Main Street	Culver Brook	No	No	No	Yes	N/A	1
69-05	Kennedy Drive	Quinebaug River	No	No	No	Yes	N/A	1
69-06	Kennedy Drive	Quinebaug River	No	No	No	Yes	N/A	1
80-02	St. James Place	Quinebaug River	No	N/A	N/A	Yes	No	1
82-01	Park Street	Culver Brook	No	No	No	Yes	N/A	1
82-02	Park Street	Culver Brook	No	No	No	Yes	N/A	1
82-03	Kennedy Drive	Quinebaug River	No	No	No	Yes	N/A	1
82-04	Kennedy Drive	Quinebaug River	No	No	No	Yes	N/A	1
82-05	Kennedy Drive	Quinebaug River	No	No	No	Yes	N/A	1
82-06	Park Road	Quinebaug River	No	No	No	Yes	N/A	1
83-04	Industrial Park Road	Culver Brook	No	No	No	No	N/A	0
90-01	Modock Road	Durkee Brook	No	N/A	N/A	Yes	No	1
92-01	Park Road	Quinebaug River	No	No	No	Yes	N/A	1
92-02	Park Road	Quinebaug River	No	No	No	Yes	N/A	1
92-03	Park Road	Quinebaug River	No	No	No	No	N/A	0
93-02	Industrial Park Road	Quinebaug River	No	Yes	No	No	N/A	1

Table 8-1 OUTFALL CATCHMENT SYSTEM VULNERABILITY FACTOR (SVF) INVENTORY								
						Sanitary and	Septic	System
			History	Increased	Sanitary	Stormdrain	System	Vulnerability Factor
		Receiving	of	SSO	Infrastructure	Infrastructure	Areas of	SVF Score =
GIS #	Street	Water Body	SSO's (1)	Potential (2)	Defects (3)	> 40 years old (4)	Concern (5)	number of
								Yes Answers
8-01	Thurber Road	Lippitts Brook	No	N/A	N/A	Yes	No	1
8-02	Thurber Road	Lippitts Brook	No	N/A	N/A	Yes	No	1
8-03	Thurber Road	Quinebaug River	No	N/A	N/A	Yes	No	1
8-04	Thurber Road	Lippitts Brook	No	N/A	N/A	Yes	No	1
104-01	River Road	Carpenter Brook	No	N/A	N/A	Yes	No	1
20-02	Mary Crest Drive	Lippitts Brook	No	N/A	N/A	Yes	No	1
21-01	Thurber Road	Lippitts Brook	No	N/A	N/A	Yes	No	1
22-01	Elvira Heights	Munson Brook	No	N/A	N/A	Yes	No	1
22-02	Elvira Heights	Munson Brook	No	N/A	N/A	Yes	No	1
22-03	Elvira Heights	Munson Brook	No	N/A	N/A	Yes	No	1
22-04	Elvira Heights	Munson Brook	No	N/A	N/A	Yes	No	1
31-03	Walnut Road	Perry Brook	No	N/A	N/A	Yes	No	1
31-04	Walnut Street	Perry Brook	No	N/A	N/A	Yes	No	1
31-05	Walnut Street	Perry Brook	No	N/A	N/A	Yes	No	1
31-06	Walnut Street	Perry Brook	No	N/A	N/A	Yes	No	1
31-07	Walnut Road	Perry Brook	No	N/A	N/A	Yes	No	1
31-08	Walnut Road	Perry Brook	No	N/A	N/A	Yes	No	1
31-10	Walnut Road	Perry Brook	No	N/A	N/A	Yes	No	1
46-01	Aldrich Road	Tavern Brk Pond No1	No	N/A	N/A	Yes	No	1
57-01	Shepards Lane	Perry Brook	No	N/A	N/A	Yes	No	1
57-02	Heritage Road	Perry Brook	No	N/A	N/A	Yes	No	1
57-03	Heritage Road	Perry Brook	No	N/A	N/A	Yes	No	1
57-04	Heritage Road	Perry Brook	No	N/A	N/A	Yes	No	1
58-01	Heritage Road	Culver Brook	No	N/A	N/A	Yes	Yes	2
58-02	Heritage Road	Culver Brook	No	N/A	N/A	Yes	Yes	2
58-03	Heritage Road	Culver Brook	No	N/A	N/A	Yes	Yes	2
63-01	Brookside Landing	Cady Brook	No	N/A	N/A	Yes	No	1
71-01	Heritage Road	Culver Brook	No	N/A	N/A	Yes	Yes	2
72-03	Five Mile River Road	Tavern Brk Pond No1	No	N/A	N/A	Yes	No	1
72-04	Five Mile River Road	Tavern Brk Pond No1	No	N/A	N/A	Yes	Yes	2
72-05	5 Mile River Road	Tavern Brk Pond No1	No	N/A	N/A	Yes	Yes	2
75-01	River Junction Estates	Five Mile River	No	N/A	N/A	No	No	0
75-02	River Junction Estates	Five Mile River	No	N/A	N/A	No	No	0
76-01	Chase Road	Five Mile River	No	N/A	N/A	Yes	No	1

Table 8-1 OUTFALL CATCHMENT SYSTEM VULNERABILITY FACTOR (SVF) INVENTORY								
						Sanitary and	Septic	System
			History	Increased	Sanitary	Stormdrain	System	Vulnerability Factor
		Receiving	of	SSO	Infrastructure	Infrastructure	Areas of	SVF Score =
GIS #	Street	Water Body	SSO's (1)	Potential (2)	Defects (3)	> 40 years old (4)	Concern (5)	number of
								Yes Answers
80-01	Mantup Road	Carpenter Brook	No	N/A	N/A	Yes	Yes	2
83-02	Killingly Ave/Rte 12	Culver Brook	No	N/A	N/A	Yes	No	1
83-05	Industrial Park Road	Culver Brook	No	No	No	No	N/A	0
83-06	Highland Drive	Culver Brook	No	Yes	No	No	N/A	1
84-01	Hurry Hill Road	Culver Brook	No	N/A	N/A	Yes	Yes	2
84-02	DeCubellis Court	Culver Brook	No	N/A	N/A	No	No	1
84-03	Paula Road	Culver Brook	No	N/A	N/A	No	No	1
93-01	Highland Drive	Culver Brook	No	Yes	No	No	N/A	1
94-02	Killingly Ave/Rte 12	Labonte Pond	No	N/A	N/A	Yes	No	1
94-03	Pierce Road	LaBonte Pond	No	N/A	N/A	Yes	No	1
94-04	Pierce Road	LaBonte Pond	No	N/A	N/A	Yes	Yes	2
95-01	Aspinock Road	Aspinock Brook	No	N/A	N/A	Yes	No	1
Colors: Orange = interconnected municipal/State drainage system								
Abbreviations:								
SSO = Sanitary Sewer Overflow								
(1) History of SSO's including, but not limited to, those resulting from wet weather, high water table, or fat/oil/grease blockages								
(2) Increased potential for SSO's due to common trench construction, storm/sanitary pipe crossings where sanitary system is above the storm drain system, sanitary sewer alignments constructed with underdrains, inadequate sewer line capacity.								
(3) Sanitary Infrastructure Defects such as leaking service laterals, cracked, broken, or offset sanitary infrastructure, directly piped connections between storm drain and sanitary sewer infrastructure, or other vulnerability factors identified through Inflow/Infiltration Analyses, Sanitary Sewer Evaluation Surveys, or other infrastructure investigations								
(4) Any sanitary sewer and storm drain infrastructure greater than 40 years old								
(5) Septic systems in areas with failures or limited suitability for subsurface sewage disposal such as small lots, high groundwater, shallow ledge, etc.								

8.2 Dry Weather Investigation (Manhole Inspections) - BMP 5e

The TOWN OF PUTNAM will implement a dry weather storm drain network investigation that involves systematically and progressively observing, sampling and evaluating key junction manholes in the MS4 to determine the approximate location of suspected illicit discharges.

The **##AGENCY OR DEPARTMENT** will be responsible for implementing the dry weather manhole inspection program and making updates as necessary. Infrastructure information will be incorporated into the storm system map, and catchment delineations will be refined based on the field investigation, where necessary. The SVF inventory will also be updated based on information obtained during the field investigations, where necessary.

Several important terms related to the dry weather manhole inspection program are defined by the MS4 Permit 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 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. Adequate implementation of the illicit discharge 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. 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.

For all catchments identified for investigation, during dry weather, field crews will systematically inspect **key junction manholes** for evidence of illicit discharges and confirm or identify potential system vulnerability factors. This program involves progressive inspection and sampling at manholes in the storm drain network to isolate and eliminate illicit discharges.

The manhole inspection methodology will be conducted in one of two ways (or a combination of both):

- By working progressively up from the outfall and inspecting key junction manholes along the way, or
- By working progressively down from the upper parts of the catchment toward the outfall and inspecting key junction manholes along the way.

For most catchments, manhole inspections will proceed from the outfall moving up into the system. However, the decision to move up or down the system depends on the nature of the drainage system and the surrounding land use and the availability of information on the catchment and drainage system. Moving up the system can begin immediately when an illicit discharge is detected at an outfall, and only a map of the storm drain system is required. Moving down the system 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 discharges are believed to be located in the upstream portions of the catchment area. Once a manhole inspection methodology has been selected, investigations will continue systematically through the catchment.

Inspection of key junction manholes will proceed as follows:

1. Manholes will be opened and inspected for visual and olfactory evidence of illicit connections. A sample field inspection form is provided in **Appendix C**.
2. If flow is observed, a sample will be collected and analyzed at a minimum for ammonia, chlorine, and surfactants. Field kits can be used for these analyses. Sampling and analysis will be in accordance with procedures outlined in **Section 7**. Additional indicator sampling may assist in determining potential sources.
3. Where sampling results or visual or olfactory evidence indicate potential illicit discharges, the area draining to the junction manhole will be flagged for further upstream manhole investigation and/or isolation and confirmation of sources.
4. Subsequent key junction manhole inspections will proceed until the location of suspected illicit discharges can be isolated to a pipe segment between two manholes.
5. If no evidence of an illicit discharge is found, catchment investigations will be considered complete upon completion of key junction manhole sampling.

8.3 Wet Weather Investigation (Outfall Sampling)

Where a minimum of one (1) System Vulnerability Factor (SVF) is identified based on previous information or the catchment investigation, a wet weather investigation must also be conducted at the associated outfall. The **##AGENCY OR DEPARTMENT** will be responsible for implementing the wet weather outfall sampling program and making updates as necessary.

Outfalls will be inspected and sampled under wet weather conditions, to the extent necessary, to determine whether wet weather-induced high flows in sanitary sewers or high groundwater in areas served by septic systems result in discharges of sanitary flow to the MS4.

Wet weather outfall sampling will proceed as follows:

1. At least one wet weather sample will be collected at the outfall for the same parameters required during dry weather screening (refer to **Table 7-3** and **Table 7-4**).
2. Wet weather sampling will occur during or after a storm event of sufficient depth or intensity to produce a stormwater discharge at the outfall.
 - a. There is no specific rainfall amount that will trigger sampling, although minimum storm event intensities that are likely to trigger sanitary sewer interconnections are preferred.

- b. Sampling during the initial period of discharge (“first flush”) will be avoided.
 - c. To the extent feasible, sampling should occur during the spring (March through June) when groundwater levels are relatively high. Refer to **Section 7.1** for information on weather tracking.
3. If wet weather outfall sampling indicates a potential illicit discharge, then additional wet weather source sampling will be performed, as warranted, or source isolation and confirmation procedures will be followed as described in **Section 8.4**.
4. If wet weather outfall sampling does not identify evidence of illicit discharges, and no evidence of an illicit discharge is found during dry weather manhole inspections, catchment investigations will be considered complete.

8.4 Source Isolation and Confirmation

Instructions: Include all relevant SOPs for specific tools such as dye testing and smoke testing, in Appendix F.

The CMRSWC “Locating Illicit Discharges SOP” provides suggested language for a source isolation and confirmation program.

http://centralmastormwater.org/Pages/crsc_toolbox/Locating%20Illicit%20Discharges%20SOP%20and%20Form_FINAL.pdf

Sample Smoke Testing SOP:

<ftp://ftp.ocfl.net/divisions/Utilities/pub/C%20I%20P/Specifications/Smoke%20Testing%20SOP.pdf>

Sample Dye Testing SOP:

http://www.oseh.umich.edu/pdf/guideline/dye_testing_guideline.pdf

Once the source of an illicit discharge is approximated between two manholes, more detailed investigation techniques will be used to isolate and confirm the source of the illicit discharge. The following methods may be used in isolating and confirming the source of illicit discharges:

- Sandbagging
- Smoke Testing
- Dye Testing
- CCTV/Video Inspections
- Optical Brightener Monitoring
- IDDE Canines.

These methods are described in the sections below. Instructions and Standard Operating Procedures (SOPs) for these and other IDDE methods are provided in **Appendix F**.

Public notification is an important aspect of a detailed source investigation program. Prior to smoke testing, dye testing, or TV inspections, the **##AGENCY OR DEPARTMENT** will notify property owners in the affected area. Smoke testing notification will include **##ROBOCALLS, ##HANGING**

NOTIFICATIONS, ## EMAIL for single family homes, businesses and building lobbies for multi-family dwellings.

8.4.1 Sandbagging

This technique can be particularly useful when attempting to isolate intermittent illicit discharges or those with very little perceptible flow. The technique involves placing sandbags or similar barriers (e.g., caulking, weirs/plates, or other temporary barriers) within outlets to manholes to form a temporary dam that collects any intermittent flows that may occur. Sandbags are typically left in place for 48 hours, and should only be installed when dry weather is forecast. If flow has collected behind the sandbags/barriers 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 the intermittent discharge. Finding appropriate durations of dry weather and the need for multiple trips to each manhole makes this method both time-consuming and somewhat limiting.

8.4.2 Smoke Testing

Smoke testing involves injecting non-toxic smoke into drain lines and noting the emergence of smoke from sanitary sewer vents in illegally connected buildings or from cracks and leaks in the system itself. Typically a smoke bomb or smoke generator is used to inject the smoke into the system at a catch basin or manhole and air is then forced through the system. Test personnel are placed in areas where there are suspected illegal connections or cracks/leaks, noting any escape of smoke (indicating an illicit connection or damaged storm drain infrastructure). It is important when using this technique to make proper notifications to area residents and business owners as well as local police and fire departments.

If the initial test of the storm drain system is unsuccessful then a more thorough smoke-test of the sanitary sewer lines can also be performed. Unlike storm drain smoke tests, buildings that do not emit smoke during sanitary sewer smoke tests may have problem connections and may also have sewer gas venting inside, which is hazardous.

It should be noted that smoke may cause minor irritation of respiratory passages. Residents with respiratory conditions may need to be monitored or evacuated from the area of testing altogether to ensure safety during testing.

8.4.3 Dye Testing

Dye testing involves flushing non-toxic dye into plumbing fixtures such as toilets, showers, and sinks and observing nearby storm drains and sewer manholes as well as stormwater outfalls for the presence of the dye. Similar to smoke testing, it is important to inform local residents and business owners. Police, fire, and local public health staff should also be notified prior to testing in preparation of responding to citizen phone calls concerning the dye and their presence in local surface waters.

A team of two or more people is needed to perform dye testing (ideally, all with two-way radios). One person is inside the building, while the others are stationed at the appropriate storm sewer and sanitary sewer manholes (which should be opened) and/or outfalls. The person inside the building adds dye into

a plumbing fixture (i.e., toilet or sink) and runs a sufficient amount of water to move the dye through the plumbing system. The person inside the building then radios to the outside crew that the dye has been dropped, and the outside crew watches for the dye in the storm sewer and sanitary sewer, recording the presence or absence of the dye.

The test can be relatively quick (about 30 minutes per test), effective (results are usually definitive), and inexpensive. Dye testing is best used when the likely source of an illicit discharge has been narrowed down to a few specific houses or businesses.

8.4.4 CCTV/Video Inspection

Another method of source isolation involves the use of mobile video cameras that are guided remotely through stormwater drain lines to observe possible illicit discharges. IDDE program staff can review the videos and note any visible illicit discharges. While this tool is both effective and usually definitive, it can be costly and time consuming when compared to other source isolation techniques.

8.4.5 Optical Brightener Monitoring

Optical brighteners are fluorescent dyes that are used in detergents and paper products to enhance their appearance. The presence of optical brighteners in surface waters or dry weather discharges suggests there is a possible illicit discharge or insufficient removal through adsorption in nearby septic systems or wastewater treatment. Optical brightener monitoring can be done in two ways. The most common, and least expensive, methodology involves placing a cotton pad in a wire cage and securing it in a pipe, manhole, catch basin, or inlet to capture intermittent dry weather flows. The pad is retrieved at a later date and placed under UV light to determine the presence/absence of brighteners during the monitoring period. A second methodology uses handheld fluorometers to detect optical brighteners in water sample collected from outfalls or ambient surface waters. Use of a fluorometer, while more quantitative, is typically more costly and is not as effective at isolating intermittent discharges as other source isolation techniques.

8.4.6 IDDE Canines

Dogs specifically trained to smell human related sewage are becoming a cost-effective way to isolate and identify sources of illicit discharges. While not widespread at the moment, the use of IDDE canines is growing as is their accuracy. The use of IDDE canines is not recommended as a standalone practice for source identification; rather it is recommended as a tool to supplement other conventional methods, such as dye testing, in order to fully verify sources of illicit discharges.

8.5 Illicit Discharge Removal - BMP 5f

When the specific source of an illicit discharge is identified, the TOWN OF PUTNAM will exercise its authority as necessary to require its removal. The annual report will include the status of IDDE investigation and removal activities including the following information for each confirmed source:

- 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
- Estimate of the volume of flow removed.

8.5.1 Confirmatory Outfall Screening

Within one (1) year of removal of all identified illicit discharges and SSO sources within a catchment area, confirmatory outfall or interconnection screening will be conducted. The confirmatory screening will be conducted in dry weather unless System Vulnerability Factors have been identified, in which case both dry weather and wet weather confirmatory screening will be conducted. If confirmatory screening indicates evidence of additional illicit discharges, the catchment will be scheduled for additional investigation. Confirmatory screening is not required in catchments where no illicit discharges or System Vulnerability Factors have been identified and no previous screening indicated suspicious flows.

8.6 Follow-up Screening – BMP 5g

Upon completion of all catchment investigations and illicit discharge removal and confirmation (if necessary), each outfall or interconnection will be scheduled for follow-up screening within five (5) years, or sooner based on the catchment's illicit discharge priority. Ongoing screening will consist of dry weather screening and sampling consistent with the procedures described in **Section 7** of this document. Ongoing wet weather screening and sampling will also be conducted at outfalls where wet weather screening was required due to System Vulnerability Factors and will be conducted in accordance with the procedures described in **Section 8.1**. All sampling results will be reported in the annual report.

8.7 Illicit Discharge Prevention Procedures – BMP 5h

The TOWN OF PUTNAM will implement the following mechanisms and procedures to assist in the prevention of illicit discharges and SSOs:

- Spill response and prevention procedures including identification of spills, reporting procedures, containment procedures, and documentation.
- Public awareness (may be part of the education program required by Subsection 2 of the MS4 Permit).

- Reporting hotlines and training of public employees involved in the IDDE program on way to identify potential illicit discharges and SSOs.

9 Training – BMP 7

Annual IDDE training will be made available to all employees involved in the IDDE program. This training will, at a minimum, include information on how to identify illicit discharges and may also include additional training specific to the functions of particular personnel and their function within the framework of the IDDE program. Training records will be maintained in **Appendix E**. The frequency and type of training will be included in the annual report.

10 Progress Reporting – BMP 6

The progress and success of the IDDE program will be evaluated on an annual basis. The evaluation will be documented in the annual report and will include the following indicators of program progress:

- Measures that demonstrate efforts to locate illicit discharges
- Number of illicit discharges identified and removed
- Percent and area in acres of the catchment area served by the MS4 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
- Estimate of the volume of sewage removed, as applicable
- Number of employees trained annually.

The success of the IDDE program will be measured by the IDDE activities completed within the required permit timelines.

Appendix A

Legal Authority (IDDE Ordinance)

LEGAL NOTICE

TOWN OF PUTNAM

The following ORDINANCE was approved at the Special Town Meeting held on October 21, 2013 and shall become effective twenty-one (21) days after date of publication.

Dated at Putnam, Connecticut this 23rd day of October, 2013.

Sara J. Seney
Town Clerk

ORDINANCE

MUNICIPAL STORM SEWER MANAGEMENT

Published in the Putnam Town Crier 10/30/2013
Effective Date 11/20/2013

MUNICIPAL STORM SEWER MANAGEMENT ORDINANCE

Description:

An illicit discharge is defined as any discharge to a municipal separate storm sewer system (stormwater drainage system) that is not composed entirely of stormwater runoff (except for discharges allowed under an NPDES permit or non-polluting flows). These non-stormwater discharges occur due to illegal dumping or illegal connections to the stormwater drainage system. This ordinance provides Putnam with the authority to deal with illicit discharges and establishes enforcement actions for those persons or entities found to be in noncompliance or that refuse to allow access to their facilities.

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- Section 7. Violations, Enforcement and Penalties

Introduction

It is hereby determined that:

Discharges to the municipal separate storm sewer system that are not composed entirely of stormwater runoff contribute to increased nonpoint source pollution and degradation of receiving waters;

These non-stormwater discharges occur due to spills, dumping and improper connections to the municipal separate storm sewer system from residential, industrial, commercial or institutional establishments;

These non-stormwater discharges not only impact waterways individually, but geographically dispersed, small volume non-stormwater discharges can have cumulative impacts on receiving waters;

The impacts of these discharges adversely affect public health and safety, drinking water supplies, recreation, fish and other aquatic life, property values and other uses of lands and waters;

October 14, 2013

These impacts can be minimized through the regulation of spills, dumping and discharges into the municipal separate storm sewer system;

Localities in the State of Connecticut are required to comply with a number of State and Federal laws, regulations and permits which require a locality to address the impacts of stormwater runoff quality and nonpoint source pollution due to improper non-stormwater discharges to the municipal separate storm sewer system;

Therefore, the *Town of Putnam* adopts this ordinance to prohibit such non-stormwater discharges to the municipal separate storm sewer system. It is determined that the regulation of spills, improper dumping and discharges to the municipal separate storm sewer system is in the public interest and will prevent threats to public health and safety, and the environment.

Section 1. General Provisions

1.1. Purpose and Intent

The purpose of this ordinance is to protect the public health, safety, environment and general welfare through the regulation of non-stormwater discharges to the municipal separate storm sewer system to the maximum extent practicable as required by Federal law. This ordinance establishes methods for controlling the introduction of pollutants into the municipal separate storm sewer system in order to comply with requirements of the National Pollutant Discharge Elimination System (NPDES) permit process. The objectives of this ordinance are to:

- (1) Regulate the contribution of pollutants to the municipal separate storm sewer system by any person;
- (2) Prohibit illicit discharges and illegal connections to the municipal separate storm sewer system;
- (3) Prevent non-stormwater discharges, generated as a result of spills, inappropriate dumping or disposal, to the municipal separate storm sewer system; and,
- (4) To establish legal authority to carry out all inspection, surveillance, monitoring and enforcement procedures necessary to ensure compliance with this ordinance.

1.2. Applicability

The provisions of this ordinance shall apply throughout the Town of Putnam.

1.3. Compatibility with Other Regulations

This ordinance is not intended to modify or repeal any other ordinance, rule, regulation, other provision of law. The requirements of this ordinance are in addition to the requirements of any other ordinance, rule, regulation, or other provision of law, and where any provision of this

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ordinance imposes restrictions different from those imposed by any other ordinance, rule, regulation, or other provision of law, whichever provision is more restrictive or imposes higher protective standards for human health or the environment shall control.

1.4. Severability

If the provisions of any section, subsection, paragraph, subdivision or clause of this ordinance shall be adjudged invalid by a court of competent jurisdiction, such judgment shall not affect or invalidate the remainder of any section, subsection, paragraph, subdivision or clause of this ordinance.

1.5. Responsibility for Administration

The *Putnam Board of Selectmen* shall administer, implement, and enforce the provisions of this ordinance. Day to day enforcement will be the responsibility of the designated, authorized agent.

Section 2. Definitions

"**Accidental Discharge**" means a discharge prohibited by this ordinance which occurs by chance and without planning or thought prior to occurrence.

"**Authorized Agent**" means the Public Works Director. The Mayor or Board of Selectmen may, in writing, designate other employees and designees as deputy authorized agents to act through the authorized agent. The authorized agent could include but not be limited to the Northeast District Department of Health, the Regional Engineer, the Town Planner, the Zoning Enforcement Officer, the Wetlands Enforcement Officer, as well as appropriate boards or commissions.

"**Authorized Enforcement Agency**" means the Town of Putnam Board of Selectmen.

"**Clean Water Act**" means the Federal Water Pollution Control Act (33 U.S.C. § 1251 et seq.), and any subsequent amendments thereto.

"**Construction Activity**" means activities subject to the Connecticut Erosion and Sedimentation Control Act or General Permit for the Discharge of Stormwater and Dewatering Wastewaters from Construction Activities. These include construction projects resulting in land disturbance. Such activities include but are not limited to clearing and grubbing, grading, excavating, and demolition.

"**Illicit Discharge**" means any direct or indirect non-stormwater discharge to the municipal separate storm sewer system, except as exempted in Section 3 of this ordinance.

"**Illegal Connection**" means either of the following:

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- a) Any pipe, open channel, drain or conveyance, whether on the surface or subsurface, which allows an illicit discharge to enter the storm drain system including but not limited to any conveyances which allow any non-stormwater discharge including sewage, process wastewater, and wash water to enter the storm drain system, regardless of whether such pipe, open channel, drain or conveyance has been previously allowed, permitted, or approved by an authorized enforcement agency; or
- b) Any pipe, open channel, drain or conveyance connected to the municipal separate storm sewer system which has not been documented in plans, maps, or equivalent records and approved by an authorized enforcement agency.

"Industrial Activity" means activities subject to NPDES Industrial Permits as defined in 40 ~FR, Section 122.26 (b)(14) or CGS 22a-430b.

"National Pollutant Discharge Elimination System (NPDES) Storm Water Discharge Permit" means a permit issued by the Connecticut DEEP under authority delegated pursuant to 33 USC § 1342(b) that authorizes the discharge of pollutants to waters of the United States, whether the permit is applicable on an individual, group, or general area-wide basis.

"Municipal Separate Storm Sewer System" means any facility designed or used for collecting and/or conveying stormwater, including but not limited to any roads with drainage systems, highways, municipal streets, curbs, gutters, inlets, catch basins, piped storm drains, pumping facilities, structural stormwater controls, ditches, swales, natural and man-made or altered drainage channels, reservoirs, and other drainage structures, and which is:

- a) Owned or maintained by the Town of Putnam;
- b) Not a combined sewer; and
- c) Not part of a publicly-owned treatment works.

"Non-Stormwater Discharge" means any discharge to the storm drain system that is not composed entirely of stormwater.

"Person" means, except to the extent exempted from this ordinance, any individual, partnership, firm, association, joint venture, public or private corporation, trust, estate, commission, board, public or private institution, utility, cooperative, city, county or other political subdivision of the State, any interstate body or any other legal entity.

"Pollutant" means anything which causes or contributes to pollution. Pollutants may include, but are not limited to: paints, varnishes, and solvents; petroleum hydrocarbons; automotive fluids; cooking grease; detergents (biodegradable or otherwise); degreasers; cleaning chemicals; non-hazardous liquid and solid wastes and yard wastes; refuse, rubbish, garbage, litter, or other discarded or abandoned objects and accumulations, so that same may cause or contribute to pollution; floatables; pesticides, herbicides, and fertilizers; liquid and solid wastes; sewage, fecal coliform and pathogens; dissolved and particulate metals; animal wastes; wastes and residues

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that result from constructing a building or structure; concrete and cement; and noxious or offensive matter of any kind.

"**Pollution**" means the contamination or other alteration of any water's physical, chemical or biological properties by the addition of any constituent and includes but is not limited to, a change in temperature, taste, color, turbidity, or odor of such waters, or the discharge of any liquid, gaseous, solid, radioactive, or other substance into any such waters as will or is likely to create a nuisance or render such waters harmful, detrimental or injurious to the public health, safety, welfare, or environment, or to domestic, commercial, industrial, agricultural, recreational, or other legitimate beneficial uses, or to livestock, wild animals, birds, fish or other aquatic life.

"**Premises**" means any building, lot, parcel of land, or portion of land whether improved or unimproved including adjacent sidewalks and parking strips.

"**State Waters**" means any and all rivers, streams, creeks, branches, lakes, reservoirs, ponds, drainage systems, springs, wells, and other bodies of surface and subsurface water, natural or artificial, lying within or forming a part of the boundaries of the State of Connecticut which are not entirely confined and retained completely upon the property of a single person.

"**Stormwater Runoff**" or "**Stormwater**" means any surface flow, runoff, and drainage consisting entirely of water from any form of natural precipitation, and resulting from such precipitation.

"**Structural Stormwater Control**" means a structural stormwater management facility or device that controls stormwater runoff and changes the characteristics of that runoff including, but not limited to, the quantity and quality, the period of release or the velocity of flow.

"**Wastewater**" means any water or other liquid, other than uncontaminated stormwater, discharged from a facility.

Section 3. Prohibitions

3.1 Prohibition of Illicit Discharges

No person shall throw, drain, or otherwise discharge, cause, or allow others under its control to throw, drain, or otherwise discharge into the municipal separate storm sewer system any pollutants or waters containing any pollutants, other than stormwater.

The following discharges are exempt from the prohibition provision above providing they contain no pollutants:

- (1) Water line flushing performed by a government agency, landscape irrigation or lawn watering, diverted stream flows, rising ground water, ground water infiltration to storm drains, uncontaminated pumped ground water, foundation or footing drains (not including active groundwater dewatering systems), crawl space pumps, air conditioning

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condensation, springs, natural riparian habitat or wetland flows, and any other water source not containing pollutants;

- (2) Discharges or flows from fire fighting, and other discharges specified in writing by the Board of Selectmen as being necessary to protect public health and safety;
- (3) The prohibition provision above shall not apply to any non-stormwater discharge permitted under an NPDES permit or order issued to the discharger and administered under the authority of the State and the Federal Environmental Protection Agency, provided that the discharger is in full compliance with all requirements of the permit, waiver, or order and other applicable laws and regulations, and provided that written approval has been granted for any discharge to the municipal separate storm sewer system.

3.2 Prohibition of Illegal Connections

The construction, connection, use, maintenance or continued existence of any illegal connection to the municipal separate storm sewer system is prohibited.

- (1) This prohibition expressly includes, without limitation, illegal connections made in the past, regardless of whether the connection was permissible under law or practices applicable or prevailing at the time of connection.
- (2) A person violates this ordinance if the person connects a line conveying sewage to the municipal separate storm sewer system, or allows such a connection to continue.
- (3) Improper connections in violation of this ordinance must be disconnected and redirected, if necessary, to an approved onsite wastewater management system or the sanitary sewer system upon approval of the Putnam Water Pollution Control Authority.
- (4) Any drain or conveyance that has not been documented in plans, maps or equivalent, and which may be connected to the storm sewer system, shall be located by the owner or occupant of that property upon receipt of written notice of violation from the authorized agent requiring that such locating be completed. Such notice will specify a reasonable time period within which the location of the drain or conveyance is to be completed, that the drain or conveyance be identified as storm sewer, sanitary sewer or other, and that the outfall location or point of connection to the storm sewer system, sanitary sewer system or other discharge point be identified. Results of these investigations are to be documented and provided to the Board of Selectmen and Water Pollution Control Authority.

Section 4. Industrial, Commercial or Construction Activity Discharges

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Any person subject to an industrial, commercial or construction activity NPDES stormwater discharge permit shall comply with all provisions of such permit. Proof of compliance with said permit may be required in a form acceptable to the authorized agent prior to allowing discharges to the municipal separate storm sewer system.

Section 5. Access and Inspection of Properties and Facilities

The authorized agent shall be permitted to enter and inspect properties and facilities at reasonable times as often as may be necessary to determine compliance with this ordinance.

- (1) If a property or facility has security measures in force which require proper identification and clearance before entry into its premises, the owner or operator shall make the necessary arrangements to allow access to representatives of the Board of Selectmen.
- (2) The owner or operator shall allow the authorized agent ready access to all parts of the premises for the purposes of inspection, sampling, photography, videotaping, examination and copying of any records that are required under the conditions of an NPDES permit to discharge stormwater.
- (3) The authorized agent shall have the right to set up on any property or facility such devices as are necessary in the opinion of the authorized agent to conduct monitoring and/or sampling of flow discharges.
- (4) The authorized agent may require the owner or operator to install monitoring equipment and perform monitoring as necessary, and make the monitoring data available to the authorized agent. This sampling and monitoring equipment shall be maintained at all times in a safe and proper operating condition by the owner or operator at his/her own expense. All devices used to measure flow and quality shall be calibrated to ensure their accuracy.
- (5) Any temporary or permanent obstruction to safe and easy access to the property or facility to be inspected and/or sampled shall be promptly removed by the owner or operator at the written or oral request of the authorized agent and shall not be replaced. The costs of clearing such access shall be borne by the owner or operator.
- (6) Unreasonable delays in allowing the authorized agent access to a facility is a violation of this ordinance.
- (7) If the **authorized agent** has been refused access to any part of the premises from which stormwater is discharged, and the **authorized agent** is able to demonstrate probable cause to believe that there may be a violation of this ordinance, or that there is a need to inspect and/or sample as part of a routine inspection and sampling program designed to verify compliance with this ordinance or any order issued hereunder, or to protect the overall public health, safety, environment and welfare of the community, then the **Board**

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of Selectmen may seek issuance of a search warrant from any court of competent jurisdiction.

Section 6. Notification of Accidental Discharges and Spills

Notwithstanding other requirements of law, as soon as any person responsible for a facility, activity or operation, or responsible for emergency response for a facility, activity or operation has information of any known or suspected release of pollutants or non-stormwater discharges from that facility or operation which are resulting or may result in illicit discharges or pollutants discharging into stormwater, the municipal separate storm sewer system, State Waters, or Waters of the U.S., said person shall take all necessary steps to ensure the discovery, containment, and cleanup of such release so as to minimize the effects of the discharge.

Said person shall notify the authorized enforcement agency in person or by phone, facsimile or in person no later than 24 hours of the nature, quantity and time of occurrence of the discharge. Notifications in person or by phone shall be confirmed by written notice addressed and mailed to the **authorized agent** within three business days of the phone or in person notice. If the discharge of prohibited materials emanates from a commercial or industrial establishment, the owner or operator of such establishment shall also retain an on-site written record of the discharge and the actions taken to prevent its recurrence. Such records shall be retained for at least three years. Said person shall also take immediate steps to ensure no recurrence of the discharge or spill.

In the event of such a release of hazardous materials, emergency response agencies and/or other appropriate agencies shall be immediately notified.

Failure to provide notification of a release as provided above is a violation of this ordinance.

Section 7. Violations, Enforcement and Penalties

7.1. Violations

It shall be unlawful for any person to violate any provision or fail to comply with any of the requirements of this Ordinance. Any person who has violated or continues to violate the provisions of this ordinance, may be subject to the enforcement actions outlined in this section or may be restrained by injunction or otherwise abated in a manner provided by law.

In the event the violation constitutes an immediate danger to public health or public safety, the **authorized agent** is authorized to enter upon the subject private property, without giving prior notice, to take any and all measures necessary to abate the violation and/or restore the property. The **authorized agent** is authorized to seek costs of the abatement as outlined in Section 7.5.

7.2 Notice of Violation

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Whenever the authorized agent finds that a violation of this ordinance has occurred, the authorized agent may order compliance by written notice of violation.

A. The notice of violation shall contain:

- (1) The name and address of the alleged violator;
- (2) The address when available or a description of the building, structure or land upon which the violation is occurring, or has occurred;
- (3) A statement specifying the nature of the violation;
- (4) A description of the remedial measures necessary to restore compliance with this ordinance and a time schedule for the completion of such remedial action;
- (5) A statement of the penalty or penalties that shall or may be assessed against the person to whom the notice of violation is directed; and,
- (6) A statement that the determination of violation may be appealed to the **Board of Selectmen** by filing a written notice of appeal within thirty (30) days of service of notice of violation.

B. Such notice may require without limitation:

- (1) The performance of monitoring, analyses, and reporting;
- (2) The elimination of illicit discharges and illegal connections;
- (3) That violating discharges, practices, or operations shall cease and desist;
- (4) The abatement or remediation of stormwater pollution or contamination hazards and the restoration of any affected property;
- (5) Payment of costs to cover administrative and abatement costs; and,
- (6) The implementation of pollution prevention practices.

7.3. Appeal of Notice of Violation

Any person receiving a Notice of Violation may appeal the determination of the authorized agent. The notice of appeal must be received within thirty (30) days from the date of the Notice of Violation. Hearing on the appeal before the Board of Selectmen *or his/her designee* shall take place within 15 days from the date of receipt of the notice of appeal. The decision of the *Board of Selectmen or their designee* shall be final.

7.4. Enforcement Measures After Appeal

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If the violation has not been corrected pursuant to the requirements set forth in the Notice of Violation or, in the event of an appeal, within 10 days of the decision of the appropriate authority upholding the decision of the authorized agent, then representatives of the Board of Selectmen may enter upon the subject private property and are authorized to take any and all measures necessary to abate the violation and/or restore the property. It shall be unlawful for any person, owner, agent or person in possession of any premises to refuse to allow the government agency or designated contractor to enter upon the premises for the purposes set forth above.

7.5 Costs of Abatement of the Violation

Within 30 days after abatement of the violation, the owner of the property will be notified of the cost of abatement, including administrative costs. The property owner may file a written protest objecting to the assessment or to the amount of the assessment within 30 days of such notice. If the amount due is not paid within thirty (30) days after receipt of the notice, or if an appeal is taken, within thirty (30) days after a decision on said appeal, the charges shall become a special assessment against the property and shall constitute a lien on the property for the amount of the assessment. Any person violating any of the provisions of this article shall become liable to the Town of Putnam by reason of such violation.

7.6 Civil Penalties

In the event the alleged violator fails to take the remedial measures set forth in the notice of violation or otherwise fails to cure the violations described therein within ten days, or such greater period as the Board of Selectmen shall deem appropriate, after the Board of Selectmen has taken one or more of the actions described above, the Board of Selectmen may impose a penalty not to exceed \$25 (depending on the severity of the violation) for each day the violation remains unremedied after receipt of the notice of violation.

7.7 Violations Deemed a Public Nuisance

In addition to the enforcement processes and penalties provided, any condition caused or permitted to exist in violation of any of the provisions of this ordinance is a threat to public health, safety, welfare, and environment and is declared and deemed a nuisance, and may be abated by injunctive or other equitable relief as provided by law.

7.8 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 and the Board of Selectmen may seek cumulative remedies.

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Appendix B

Storm System Mapping

Instructions: Include a paper or digital copy of the municipality's most current version of its storm system mapping.

A paper copy would not be legible and a digital copy is too large. Copies are available in the DPW office.

Appendix C

Field Forms, Sample Bottle Labels, and Chain of Custody Forms

Instructions: Include copies of the following field sampling documents:

- *Dry weather outfall inspection/sampling form*
- *Wet weather outfall inspection/sampling form*
- *Manhole inspection form*
- *Example sample labels (provided by laboratory)*
- *Example chain-of-custody form(s) (provided by laboratory)*

First 3 items provided. The last two will have to come from lab chosen by the Town.

Outfall ID: _____ Town: _____
 Inspector: _____ Date: _____
 Street Name: _____
 Last rainfall event: _____

DRY WEATHER OUTFALL INSPECTION SURVEY

Type of Outfall (check one):		Pipe Outfall <input type="checkbox"/>	Open Swale Outfall <input type="checkbox"/>
Outfall Label:	Stencil <input type="checkbox"/>	Ground Inset <input type="checkbox"/>	Sign <input type="checkbox"/> None <input type="checkbox"/> Other _____
Pipe Material:	Concrete <input type="checkbox"/> Corrugated metal <input type="checkbox"/> Clay Tile <input type="checkbox"/> Plastic <input type="checkbox"/> Other: <input type="checkbox"/>	Pipe Condition:	Good <input type="checkbox"/> Poor <input type="checkbox"/> Fair <input type="checkbox"/> Crumbling <input type="checkbox"/>
Swale Material:	Paved (asphalt) <input type="checkbox"/> Concrete <input type="checkbox"/> Earthen <input type="checkbox"/> Stone <input type="checkbox"/> Other: <input type="checkbox"/>	Swale Condition:	Good <input type="checkbox"/> Poor <input type="checkbox"/> Fair <input type="checkbox"/> Crumbling <input type="checkbox"/>
Shape of Pipe/Swale (check one)			
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Rounded Pipe/Swale		Rectangular Pipe/Swale	Trapezoidal Swale
Pipe Measurements:	Swale Measurements:	Is there a headwall?	Location Sketch
Inner Dia. (in): d= _____	Swale Width (in): T= _____	Yes <input type="checkbox"/> No <input type="checkbox"/>	
Outer Dia. (in): D= _____	Flow Width (in): t= _____	Condition:	
Pipe Width (in): T= _____	Swale Height (in): H= _____	Good <input type="checkbox"/> Poor <input type="checkbox"/>	
Pipe Height (in): H= _____	Flow Height (in): h= _____*	Fair <input type="checkbox"/> Crumbling <input type="checkbox"/>	
Flow Width (in): h= _____*	Bottom Width (in): b= _____		
Description of Flow: Heavy <input type="checkbox"/> Moderate <input type="checkbox"/> Trickling <input type="checkbox"/> Dry <input type="checkbox"/>			
If the outlet is submerged check yes and indicate approximate height of water above the outlet invert. h above invert (in):			Circle All Materials Present:
Odor:	Yes <input type="checkbox"/> No <input type="checkbox"/>		Rip rap
Optical enhancers suspected?	Yes <input type="checkbox"/> No <input type="checkbox"/>		Excessive sediment
Has channelization occurred?	Yes <input type="checkbox"/> No <input type="checkbox"/>		Foam
Has scouring occurred below the outlet?	Yes <input type="checkbox"/> No <input type="checkbox"/>		Sanitary Waste
Required Maintenance:	Tree Work	Remove Trash/Debris	Orange Staining
	Ditch Work	Blocked Pipe	
	Structural Corrosion	Erosion at Structure	
	N/A	Other	
Comments:			Sheen: Bacterial Sheen: Petroleum Floatables Algae Excessive Vegetation

Outfall I.D.: _____ Date: _____

Inspector: _____

Time of Inspection: _____

Street Name _____

Last rainfall event _____

WET WEATHER OUTFALL INSPECTION SURVEY

Visual Inspection:	Yes	No	Comments (Include probable source of observed contamination):
Color	<input type="checkbox"/>	<input type="checkbox"/>	
Odor	<input type="checkbox"/>	<input type="checkbox"/>	
Turbidity	<input type="checkbox"/>	<input type="checkbox"/>	
Excessive Sediment	<input type="checkbox"/>	<input type="checkbox"/>	
Sanitary Waste	<input type="checkbox"/>	<input type="checkbox"/>	
Pet Waste	<input type="checkbox"/>	<input type="checkbox"/>	
Floatable Solids	<input type="checkbox"/>	<input type="checkbox"/>	
Oil Sheen	<input type="checkbox"/>	<input type="checkbox"/>	
Bacterial Sheen	<input type="checkbox"/>	<input type="checkbox"/>	
Foam	<input type="checkbox"/>	<input type="checkbox"/>	
Algae	<input type="checkbox"/>	<input type="checkbox"/>	
Orange Staining	<input type="checkbox"/>	<input type="checkbox"/>	
Excessive Vegetation	<input type="checkbox"/>	<input type="checkbox"/>	
Optical Enhancers	<input type="checkbox"/>	<input type="checkbox"/>	
Other _____			

Sampling Form

Sample Parameter	Test Method	Benchmark	Field Test Result
Ammonia	Meter/test kit	>0.5 mg/L	
Surfactants (Detergents)	Meter/test kit	>0.25 mg/L	
Chlorine	Meter/test kit	>0.02mg/L	
Conductivity	meter	>2000uS/cm	
Temperature	meter		
Salinity	meter		
Indicator Bacteria E. Coli	Lab	See section 5.3	n/a
Total Phosphorus	Lab		n/a
Total Nitrogen	Lab		n/a

Additional information regarding sampling procedures can be found in section 4.2.

Acceptable meters and test kits are listed in table 7-2.

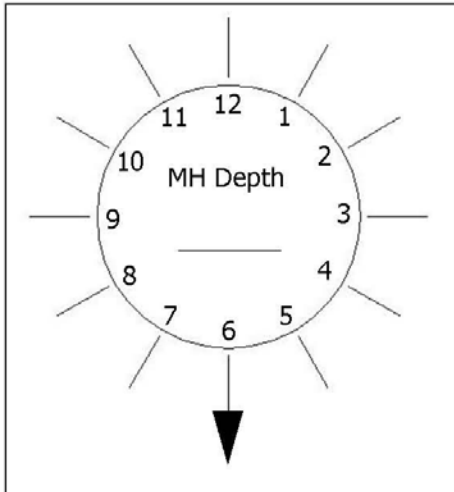
Manhole Inspection Form

Catchment ID	Date
Manhole ID	Rain Last 48 Hours
Street Location	
Inspector	

J & D

CIVIL
ENGINEERS

401 Ravenelle Road
North Grosvenordale, CT 06255
office@jdcivilengineers.com
860-923-2920



Sketch direction(s) of incoming flow

Clock Position (1-12) Pipe Material (Conc., HDPE, PVC, Ductile Iron, CMP)	Pipe Diameter (in.)	Invert Elevation (Ft)	Upgradient Structure/Source (MH, ID, CB, Priv, Unk)	Flow (Damp, Trickle, Moderate, High)

Cover Conditions: Diameter of clear opening (in.) Buried: ☐ Cannot Inspect: ☐ Cannot Locate: ☐

Evidence of Flow: ☐ Yes ☐ No **If Yes, Description of Flow:** ☐ Damp ☐ Trickle ☐ Moderate ☐ High

Visual Evidence of Illicit Discharge

Visual Inspection: ☐ None ☐ Floatables ☐ Pet Waste ☐ Oily Sheen ☐ Sanitary Waste ☐ Algae ☐ Foam

Olfactory Evidence of Illicit Discharge

Olfactory Inspection: ☐ None ☐ Sewage Smell ☐ Musty ☐ Rotten Eggs ☐ Ammonia ☐ Petroleum

Samples Taken and Sampling Results

Temp.	Conductivity	Salinity	Chlorine
Ammonia	Surfactants	Bacteria	Pollutant of Concern

COMMENTS:

Further investigation needed? ☐ Yes ☐ No

Appendix D

Water Quality Analysis Instructions, User's Manuals and Standard Operating Procedures

Instructions: Include paper or digital copies of water quality analysis instructions, procedures, and SOPs for all sample parameters and all meters or field test kits that are used for analysis. This includes the manufacturer's instructions for how to use field test kits as well as the manufacturer's instructions or user's manual for any field instrumentation.

These will have to be added by the Town once they purchase the test kits.

Appendix E

IDDE Employee Training Record

**Illicit Discharge Detection and Elimination (IDDE) Program
Employee Training Record**

Putnam, Connecticut

Date of Training: _____

Duration of Training: _____

Name	Title	Signature

Appendix F

Source Isolation and Confirmation Methods: Instructions, Manuals, and SOPs

Instructions: Provide manufacturer instructions, manuals and procedures and any in-house SOPs used to perform source isolation and confirmation for illicit discharges.

To be added by Town once such techniques and manufacturers have been identified