STORMWATER MASTER PLAN

FOR
CANTON, MASSACHUSETTS

Revision Date: OCTOBER 30, 2014

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Bright People. Right Solutions.

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LIST OF ADDITIONAL REFERENCED REPORT SOURCES

1. IWRMP Year 1 Report
2. Town of Canton Stormwater Map Book
3. EPA's Guidance for Determining Waters Protected by the Clean Water Act
4. 2003 NPDES MS4 General Permit
5. Draft Massachusetts North Coastal NPDES MS4 General Permit
6. Draft New Hampshire NPDES MS4 General Permit
7. Neponset River Watershed Association Website
8. EPA Public Education & Outreach Guidance Web Page
9. Central Massachusetts Stormwater Coalition Website
10. Town of Canton Water Conservation Newsletter/Bill Stuffer
11. EPA Annual Report Archives Web Page
12. Town of Canton Storm Sewer System Map
13. Consolidated Drainage By-Law
14. Town of Canton Planning Board Rules and Regulations
15. Town of Canton Development Handbook
16. Town of Canton Stormwater Regulations
17. EPA's Guidance for Implementing Green Infrastructure – Overcoming Barriers to LID
18. 319 Grant Report Stormwater BMP Retrofit Development Canton, MA

1.0 STORMWATER MASTER PLAN OVERVIEW

1.1 Introduction and Plan Goals

This Stormwater Master Plan is a comprehensive reference for the Town's operation, maintenance and management of the stormwater infrastructure within the community. It is the next step in the Town's progress towards an Integrated Water Resources Management Program (IWRMP). The IWRMP is the program basis for evaluation, prioritization and execution of water resource infrastructure investments. The Town has already developed a Water System Master Plan upon which they rely for capital planning, and has also developed a Comprehensive Wastewater Management Plan (CWMP) that provides an outline basis for evaluating wastewater system demands. This Stormwater Master Plan provides a comparable planning level description of drainage system condition and extents, with recommended additional assessments to evaluate infrastructure investment or re-investment demands.

The Stormwater Master Plan is intended for use in tandem with planning tools existing and in development, such as GIS mapping, asset management programs, and plans and policies incorporated or appended to the Master Plan. It is essentially a "portal" to a compiled and systematized resource library of documents, maps, standards, protocols, procedures and databases essential to the operation and management of the Town's drainage infrastructure. Among these is the NPDES MS4 Stormwater Management Plan (MS4 SWMP), included herein under **Section 2** of the Master Plan which documents the current status and proposed program for stormwater management infrastructure and procedures for the Town of Canton in accordance with relevant regulatory requirements (specifically the National Pollutant Discharge Elimination System MS4 General Permit). The MS4 SWMP contains a summary of existing and required plans, mapping, procedures, analysis and basis for proposed steps going forward, much of which is provided in detail in documents appended to the Master Plan. The relationship of this Master Plan to those documents is defined in the specific sections of this report. This plan, and the associated plans incorporated by reference or appended, is intended to maintain the Town's compliance with the US EPA NPDES Stormwater Phase II Final Rule, and to provide the necessary platform for continued compliance under ensuing permit terms. The NPDES-mandated MS4 SWMP is a component of the Town's overall Stormwater Master Plan.

In a collaborative planning exercise, the Town established a framework for the Stormwater Master Plan as follows:

A. Plan Purpose:
   To establish a means to manage stormwater resources that allows funding, planning, building, operating and maintaining stormwater infrastructure to enhance water quality by correcting existing problems, and preventing new ones.

B. Plan Goals:
   - Measure current status of all significant stormwater assets
   - Develop report methodologies based on data collected
   - Establish how to plan to maintain and improve stormwater assets
   - Identify sustainable funding mechanisms to maintain and enhance water quality

- Establish documentation standards that facilitate regulatory reporting
- Establish documentation standards that promote public understanding of stormwater infrastructure functions and value.

C. Measures of Success: (Improvements to be achieved compared to baseline defined)
   - Improved protection of people and property
   - Reduced cost/greater efficiency associated with system operation
   - Improved water quality in stormwater receiving waters
   - Regulatory compliance

Note: The electronic version of this Stormwater Master Plan is provided as part of a larger Integrated Water Resources Plan. The Stormwater Master Plan contains hyperlinks to other portions of the IWRMP, to Appendices, to other reference documents, and to external web sites. For the internal hyperlinks to function properly, simply maintain the IWRMP folder structure intact when copying or moving it.

1.2 Inventory of Municipal Drainage System Infrastructure

1.2.1 Introduction

The Town has determined that adoption of an asset management program that prioritizes capital planning in the long term on the basis of risk is the most cost-effective and practical approach to managing and operating its infrastructure. It is the common platform upon which all infrastructure systems (water, wastewater and stormwater) can be evaluated, and predictive/preventive maintenance and operations can be optimized. It is an essential element of an IWRMP. A detailed description of Canton's asset management approach is provided in the Canton Asset Management Program (CAMP) Year 1 Report found here. In general, the approach requires:

- Creating an asset inventory and determining physical condition for all assets (e.g. catch basins, pipeline, manholes, outfalls, etc.),
- defining the required level of service for the asset or category of assets,
- identifying assets critical to sustaining that level of service,
- identifying optimal predictive/preventive maintenance and operating strategies,
- identifying capital planning strategies and
- implementing a long-term funding strategy in order to be able to execute on the plan.

1.2.2 Inventory Status

In order to accomplish step one of this approach as it relates to stormwater infrastructure, the Town has initiated a drainage system asset inventory, although this is an ongoing effort. [Note: Status of asset inventory as it relates to the sewer and water systems is reported in detail in the CAMP Year 1 Report.] There are data gaps associated with the system and future field investigations (scope details provided in CAMP Year 1 Implementation Report) will be undertaken to address those gaps.

For instance, as detailed in the Asset Management Year 1 Implementation Report, there are only 56 miles of drain line work within existing records compiled to create the current stormwater GIS data layer. This compares with about 86 miles of sewer gravity lines, almost 120 miles of water mains, and 159 road miles in Canton. Future field investigations will address the data gaps represented by this disparity and the limited confidence in accuracy and extent of condition data associated with specific assets.

A description of the Town's stormwater infrastructure, as currently understood and mapped was developed and is presented in the Town of Canton Illicit Discharge Detection and Elimination (IDDE) Plan updated in July 2013. The IDDE Plan is provided as Appendix A of this report. The Town maintains a GIS database that includes an inventory of stormwater system assets which is updated periodically. The current database was compiled using digital files provided by the Town, after which Kleinfelder conducted an intensive data clean-up and compilation task to create a reliable data set. Additional information regarding the GIS development is provided in the CAMP Year 1 Implementation Report.

A copy of the June 2013 Stormwater Base Map generated on the basis of the GIS data is provided here as Figure 1-1 and is also provided as Appendix B of the IDDE Plan. Some of the information provided in the IDDE Plan has been summarized here.

The 2013 Map includes the following information:

- catchbasins
- drain manholes
- MS4 outfalls
- catchment areas contributing stormwater to outfalls
- wetlands
- receiving waters (including those that are impaired)
- drainage pipes
- interconnections with other MS4 permittees
- stormwater BMP structures (oil water separators, stormceptors, detention areas)
- USGS drainage sub-basins

Please refer to the IDDE Plan for a complete description of the system and the mapping progress and accuracy achieved to date. In general, the existing level of accuracy for the outfalls on the maps is adequate for planning level purposes and IDDE investigation. In addition to the base map, the Town utilizes an 11x17-inch sized map book that covers the entire Town. The Map Book is broken into tiles corresponding to the Town's Assessors maps. Each tile is shown on a separate page at a scale of 1 inch equals 200 feet. The 11x17 maps show stormwater drainage, topography, catchments, parcels, and wetlands on an aerial photograph background. The approach going forward is for DPW field staff uses the Map Book in the field to note mapping discrepancies and to add missing infrastructure, to a planning level of accuracy. The paper markups will then be used to update the GIS periodically. Eventually, the Town envisions direct GIS edit/update capability through portable tablets through which data is updated in real time.

The Town of Canton had originally developed an inventory of a total of 270 outfalls. This inventory was stored in a Microsoft Access database generated by the Town which includes street location, ease of accessibility, and structure type. The database also tracks water quality sampling data. In addition, the Town has a database of scanned PDF drawings (record drawings where available) with each clearly identified outfall as well as a photograph of each outfall. All of this information is attached to the outfall features in the GIS and will be imported to the Town's VueWorks Asset Management software system when the data is accepted by the Town.

Insert Figure 1-1 – Stormwater Base Map as 11x17 fold.

During the 2012-2013 update of the Stormwater Mapping, it was observed that many of the 270 outfalls appeared to fall outside of the jurisdiction of the MS4 program because they did not meet the definition of an outfall under 40 CFR 122.2. In brief, an outfall is a point source discharge to rivers and streams (including intermittent streams, provided they are hydraulically connected to a perennial stream) or to lakes and ponds. An outfall would also be jurisdictional under the MS4 if it discharged to a wetland bordering on a river, stream, pond or lake. An outfall discharging to an isolated wetland is not jurisdictional under the MS4.

Kleinfelder reviewed all of the 270 structures identified as outfalls in the Town's database, and sorted them into three categories: MS4, Non-MS4 and Unknown outfall. The categorization was based on the EPA federal regulation 40 CFR 122.2 definition for outfalls[1], the EPA's guidance for determining waters protected by the Clean Water Act (aka 'waters of the US')[2], and the definitions for lakes, ponds, rivers and streams from the Massachusetts version of the Clean Water Act , 314 CMR 4.[3]

In summary, the categorization found the following:

- 154 MS4 Outfalls in Canton
- 116 Non-MS4 Outfall structures in Canton

1.2.3 Preliminary Condition Assessment

The Town has adopted a five-year asset management program implementation timeline during which time necessary data will be collected and entered into its database for use with its chosen software platform. At this preliminary stage, since the inventory of stormwater assets is the most incomplete of the three systems, similarly the condition of identified assets within the stormwater infrastructure network is relatively unknown compared to potable water and wastewater systems. Some condition assessment on the basis of institutional knowledge was gained as a result of a Stormwater Survey questionnaire that was distributed to various Canton staff and officials whose duties touched upon the stormwater system in some way. The Survey is described further below in 1.3.2.

Field investigations for inventory and condition assessment will be prioritized on the basis of potential to contribute pollutants to stormwater discharges, and further refined based on critical data gap areas. This process is described more fully in Section 1.3.2 below and in the IDDE Plan. The IDDE Plan provided the initial attempt to prioritize inspections of catchment areas. This is a dynamic process that is continually refined based on new information, or identification of critical missing information.

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[1] *Outfall* (40 CFR 122.2): means a point source at the point where a municipal separate storm sewer discharges to waters of the United States. ***Point source*** **means a discernible, confined, and discrete conveyance, including but not limited to, any pipe, ditch, channel, tunnel, conduit, (also bridge drains); this term does not include return flows from irrigated agriculture or agricultural storm water runoff.**

[2] http://water.epa.gov/lawsregs/guidance/wetlands/CWAwaters_guidesum.cfm

[3] Lakes & Ponds: waterbodies having open water, in a topographical depression with a max depth of greater than 2 meters- does not include stormwater basins, ww lagoons, constructed farm ponds (no surface flow in/out). Rivers & Streams: waterbodies contained within a channel (natural or artificial) which periodically or continuously contains flowing water or forms a connecting link between two bodies of standing water

1.3 Drainage Basins & Receiving Waters

1.3.1 Impaired Waters

The stormwater base map prepared for the town includes surface waters associated with the Town's MS4, including impaired waters. DEP is responsible under Massachusetts General Law (MGL) chapter 21 for monitoring the waters of the Commonwealth, identifying those waters that are impaired, and developing a plan to bring them back into compliance with the Massachusetts Surface Water Quality Standards. The list of impaired waters, better known as the "303d list," identifies river, lake, and coastal waters and the reasons for impairment.

Once a waterbody is identified as impaired, DEP is required by the Federal Clean Water Act to essentially develop a "pollution budget" designed to restore the health of the impaired waterbody. The process of developing this budget, generally referred to as a Total Maximum Daily Load (TMDL), includes identifying the causes (types of pollutant) and source(s) of the pollutant from direct discharges (point sources) and indirect discharges (non-point sources), determining the maximum amount of the pollutant that can be discharged to a specific water body to meet water quality standards, and developing a plan to meet that goal.

303(d) bodies of water and identified pollutants/stressors within the Town of Canton are identified in Section 1.3 of the IDDE Plan provided as Appendix A. A summary of impaired waters is provided below in Table 1-1.

Table 1-1: Impaired Waters, Town of Canton MA

2012 Impaired Waters (Impairment Category*)	Segment ID	2012 Impairments	Associated Approved TMDL (DEP#)**
Ponkapog Brook (4a)	MA73-27	Pathogens	121.0 (EPA2592)
Ponkapog Pond (4a)	MA73-043	Non-native aquatic plants Mercury in fish	EPA 42409
Reservoir Pond (4a)	MA73-048	Non-native aquatic plants Mercury in fish	EPA 42400
Glen Echo Pond (4c)	MA73022	Non-native aquatic plants*	
Pequid Brook (5)	MA73-22	Dissolved Oxygen Fecal coliform	121.0 (2592)
Neponset River (5)	MA73-01	DDT E. Coli Total Phosphorus Sedimentation/Siltation Dissolved Oxygen TSS excess algal growuth Turbidity PCBs in fish	

2012 Impaired Waters (Impairment Category*)	Segment ID	2012 Impairments	Associated Approved TMDL (DEP#)**
Neponset River (5)	MA73-02	Other DDT Debris/Floatables/Trash Foam/flocs/scum/oil slicks Dissolved Oxygen E. Coli, Fecal Coliform PCB in fish tissue Turbidity	121 (2592)
East Branch of Neponset River (known locally as the Canton River) (5)	MA73-05	DDT Dissolved Oxygen Low flow alterations PCB in fish water Temperature Fecal coliform, E coli Aquatic macroinvert bioassess	2592
Forge Pond (5)	MA73-020	turbidity	
Beaver Meadow Brook (5)	MA73-20	Dissolved Oxygen	
Massapoag Brook (5)	MA73-21	Non-native aquatic plants* Aquatic macroinvert bioassess Total Phosphorus turbidity	
Bolivar Pond (5)	MA73-005	Turbidity Non-native aquatic plants	
+Pecunit Brook (5)	MA73-25	E. Coli	121.5 (pending)
Pequid Brook (5)	MA73-22	Dissolved oxygen	
Other Receiving Waters			
Steep Hill Brook (3)	MA73-18		

Notes:

*Category Definitions:
2- Attaining some uses; other uses not assessed
3-Insufficient information to make assessments for any use
4a –TMDL completed and approved for one or more pollutants
4c – Impairment not caused by a pollutant
5- Impaired and requiring a TMDL

**121.0 *2002 Final TMDL Bacteria Neponset River Basin*

121.5 June 2012, *Draft Addendum to the Neponset River Bacterial Final TMDL*; the Addendum would add Pecunit Brook to the Final Neponset Bacteria TMDL

1.3.2 Other Contributing Conditions

The Town delineated outfall catchments associated with all of the MS4 outfalls under their jurisdiction and prioritized them for further investigation on the basis of criteria provided in the 2010 draft MS4 general permit. The results of that prioritization process are provided in Section 4 of the IDDE Plan.

In April 2014, the Town hosted a workshop for selected staff responsible for stormwater infrastructure operation and maintenance in the community. Prior to the workshop, a survey was distributed more broadly to Town Staff who did, or could, have knowledge of or responsibilities for operation, maintenance, administration or construction of stormwater infrastructure components. The survey was intended to identify and collect existing records (e.g. maps, record drawings, task order records) that were not already provided by the DPW and to solicit anecdotal or personal knowledge of problematic areas, assets or resources that should be addressed through the IWRMP and the proposed new capital planning process. A copy of the survey and a table summarizing results is provided as Appendix B. The information obtained through the survey was integrated as a parameter for prioritization of catchments in much the same manner as the criteria provided in the 2010 Draft MS4 permit.

At the April workshop, the attending staff was asked to confirm the findings of the original characterization and prioritization of the catchments on the basis of their practical experience maintaining the system. They provided additional information about physical and/or hydraulic "problem areas" in the community where flooding, erosion, undersized culverts or other hazards/challenges were observed. On the basis of this "calibration" task, some catchments were re-prioritized. Ultimately, as provided for in the 2010 Draft MS4 General Permit, the Town prioritized catchments for investigation based on a combination of regulatory criteria, local knowledge, and identified areas where critical data gaps make it difficult to fully understand system operational characteristics. This exercise was a demonstration of the dynamic nature of the program and the intent to inform allocation of resources on the basis of improved data. The map showing identified "first priority" catchments as modified through the calibration process is provided in Figure 1-2. Catchment priorities may change again based on most recent (2014 Draft MA MS4 permit) conditions whereupon catchments draining to bacteria-impaired TMDL-approved receiving waters must be categorized as either problem or High priorities. This change will be incorporated in the next iteration of catchment priorities.

1.4 Regulatory Context and Relevant Requirements

1.4.1 Current Permit Status

On December 8, 1999, the US Environmental Protection Agency published the National Pollution Discharge Elimination System (NPDES) Final Rule as applies to stormwater discharges from small Municipal Separate Storm Sewer System operators (small MS4s). This action brought almost 200 Massachusetts cities and town under EPA NPDES jurisdiction. The Commonwealth of Massachusetts has not pursued nor has it obtained delegated authority from EPA to administer the program. Consequently, the permit was issued jointly by EPA and the Massachusetts DEP. The first MS4 2003 General Permit was issued in 2003 and was expected to be re-issued in 2008 at the end of the initial 5-year permit term. EPA eventually issued a draft permit for Massachusetts in February 2010 (2010 Draft Permit) for the North Coastal Region, which encompasses the Town of Canton, and a second draft permit for the rest of the state in November 2010. In February of 2013, EPA published a 2013 Draft New Hampshire MS4 General Permit and allowed an extended comment period from February 12 – August 15, 2013. Although that permit has not yet been issued final, **EPA has indicated that this NH draft permit will be the template for a single Commonwealth-wide draft permit to be re-issued in the future.** The new 2014 draft Massachusetts General Permit was issued September 30, 2014 for public comment. The comment period extends to December 29, 2014.

For purposes of this section, reference is made exclusively to the 2013 Draft NH MS4 General Permit.

Insert Figure 1-2 prioritized catchments.

1.4.2 Anticipated Regulatory Changes

EPA issued a new Draft Massachusetts Small MS4 General Permit for comment on September 30, 2014. The draft will have an extended comment period of 90 days (closing December 29, 2014. Although no final publication date has been announced, typically it takes from 9 – 12 months after comments have been received for EPA to publish a final permit. Consequently, it is possible that the final permit may be published prior to the end of the 2015 calendar year. This analysis relied generally on EPA's statement that the pending draft (recently issued) would be similar in most respects to the existing Draft NH MS4 General. Although the publication of a Final Permit for the NPDES Phase II Program continues to be delayed, the Town of Canton remains aware that preparation will improve their ability to initiate an agile response when the permit is issued. In the interim, the previous 2003 permit is still in effect and Canton must remain in compliance with the conditions of that permit. **For the purpose of developing Canton's Stormwater Master Plan and Canton's MS4 Stormwater Management Plan provided in Section 2 here, the draft terms and conditions provided in the Draft NH MS4 General Permit, have been relied upon, as recommended by EPA**. [Note: the 2014 Draft MA MS4 General Permit was issued after this draft SWMP was provided to the Town and prior to finalizing the Stormwater Master Plan. Discrepancies between the anticipated new permit described herein and the new 2014 Draft MS4 will be addressed during client comment incorporation into this draft document.]

It has been several years since the expiration of the 2003 General Permit and issuance of original draft permits and certain circumstances have changed since the last draft. These include development and approval of new total maximum daily loads (TMDL) and waste load allocations for some water bodies and the completion of the 2010 census and resulting newly designated urban areas and permittees. In terms of impact on level of effort to comply, the most significant change under the proposed new General Permit is EPA's determination that the permit required more prescriptive requirements for discharges to impaired waters without approved TMDLs. Waters in Canton that would be subject to these new requirements include Pequid Brook, stretches of the Neponset River, Forge Pond, Beaver Meadow Brook, Massapoag Brook and Bolivar Pond. These prescriptive requirements are extensive, and may require Canton to address impaired waters with essentially the same level of effort (or more), and within generally similar timeframes (or even more compressed), as receiving waters subject to TMDLs. Further discussion of these requirements is provided below.

As it was previously, the permit is divided into "water quality-based effluent limitations" and requirements to reduce pollutants to the "maximum extent practicable" or MEP. The latter requirements are typically referred to as the six Minimum Control Measures (MCM) and include public education and outreach; public participation; illicit discharge detection and elimination (IDDE); construction site stormwater runoff controls; post-construction (new and redevelopment) runoff controls; and good housekeeping or municipal operations. The potential impacts on Canton's program as currently administered to address these MCM's is discussed in greater detail in **Section 2** of this Master Plan.

1.4.2.1 Water Quality-Based Effluent Limitations

For both TMDL-approved and impaired waters without an approved TMDL, most activities, including implementation, must take place within the 5-year permit term. This will pose a significant administrative, technical and financial burden on Canton. Construction of structural controls are included in that implementation period, although there is the opportunity to extend

schedules for constructed BMPs addressing discharges to water bodies with an approved TMDL. If schedules cannot be met, the reasons for the delay, and documentation regarding when the control will be constructed and how it will be funded must be provided to EPA. The language in the permit requires that the structural BMPs addressing TMDLs must be completed "as soon as possible" but there is no indication of what criteria will be used to determine what is "soon enough." For impaired waters without an approved TMDL, however, the schedules are more stringent and time extensions do not exceed the 5-year permit term.

As part of the MS4 Notice of Intent submittal, Canton will be responsible for identifying all receiving water bodies for their MS4 discharges, determining the water quality standards associated with that water body, and determining if there is any impairment or approved TMDL associated with the water body. Discharges from an MS4 may not cause or contribute to the exceedance of the water quality standards (whether numeric or narrative). If Canton knows of any exceedances caused by their discharge, they must correct the situation within 60 days. If they cannot correct within that timeframe, there are additional steps to be taken (described below regarding the Water Quality Response Plan). Here, as it does throughout the permit, it is made clear that the 60 days is not a "grace period" and that the exceedance constitutes a violation of the permit.
This stipulation is an example of some of the important language changes from the previous permit. In the past, the permit has included language that stated "discharges will be presumed to meet the applicable water quality standards if the permittee fully satisfies the provisions of this permit." In Massachusetts, conducting the program in accordance with the plan written in conformance with the permit constituted a compliant program. This threshold of performance is no longer the standard, and quantitative criteria will now determine compliance across the entire program.

1.4.2.2 Total Maximum Daily Loads (TMDLs)

The NH General Permit addresses water bodies with approved chloride, bacteria, and phosphorus TMDLs. Communities with water bodies within their boundaries that are subject to approved TMDLs for chloride and bacteria will be required to address the waste load allocation component primarily through non-structural controls associated with municipal operations and maintenance activities. Since most of these activities are required elements under the MCMs, they do not necessarily pose an additional burden. The phosphorus TMDL, however, will require development and implementation of an aggressive Phosphorus Control Plan. Achievement of reductions stipulated in the permit will be measured through quantitative calculations of reductions in total phosphorus load from a baseline load established within the permit, or developed by the permittee using a methodology dictated by EPA. There are no water bodies in Canton currently covered by an approved TMDL for phosphorus, however, a segment of the Neponset River and Massapoag Brook are both listed as impaired for Total Phosphorus (among other impairments) and a TMDL will eventually be applicable.

There are several components of the Phosphorus Control Plan and the deadlines for each are provided in the table below.

Phosphorus Control Plan Component	**Completion Date**
Cost and funding source assessment	1 year after effective date
Legal Analysis	1 year after effective date
Estimation of phosphorus loadings and reductions	2 years after effective date

Scope of PCP	2 years after effective date
Description of planned non-structural controls	2 years after effective date
Description of planned structural controls	2 years after effective date
Implementation Schedule	2 years after effective date
Inventory of priority ranking of locations for structural retrofits	3 years after effective date
Evaluation of performance of structural and non-structural measures implemented	5 years after effective date

All of the non-structural controls must be fully implemented within three years of the permit effective date, unless a rationale is provided to and accepted by EPA. If structural controls are expected to take longer than that, the permittee must have a schedule for completion of construction "as soon as possible, including identification of a funding source."

1.4.2.3 Impaired Waters without a TMDL

This section of the permit is much more prescriptive than the previous permit term, and will apply to several Canton water bodies. The permittee is required to develop a program that incorporates EPA's iterative approach to addressing discharges to impaired water bodies even in the absence of a defined pollutant reduction target. The described approach is three-phased and includes preliminary source evaluation within one (1) year of the permit, implementation of BMPs and finalization of the source identification and assessment within three (3) years of the permit, and assessment of BMP effectiveness/identification of prospective new BMPs within five (5) years of the permit effective date.

Each of these phases has multiple tasks, including the development of a Water Quality Response Plan (WQRP) in Phase 1. This document is intended to be a separate section of the MS4 SWMP. The preliminary evaluation of impacts and potential pollutant sources in the WQRP can be "qualitative" according to the permit, but it must take into consideration available data, land uses, impervious cover statistics and other relevant documentation. The WQRP must address all catchments/outfalls to impaired waters and for all pollutants of concern causing the impairments. The plan must identify BMPs that will be employed and those BMPs must consider specific areas identified in the permit, such as development standards, municipal operations and structural controls.

Implementation of the BMPs identified in the plan must start as soon as possible, but no later than 18 months after the permit effective date, and must all be in place within three years. Non-structural controls are assumed to be in place within two years. If identified structural controls cannot be built within three years, then a schedule for completion of construction must be provided after Year 2 of the permit and construction must take place within five years of the permit effective date. Phases 2 and 3 of the iterative approach are essentially the implementation phase and the reassessment of BMPs. In short, the schedule of activity associated with impaired waters without a TMDL is more compressed, and could entail a greater level of effort and cost than compliance with TMDL approved reductions. In addition, it requires the regulated community to start evaluating effectiveness of a BMP almost immediately upon implementation. Since in many cases observable or measurable improvement in water quality may take several years, it is not entirely clear how effectiveness will be measured.

1.4.2.4 Summary of Expected Future MA General Permit Requirements and Canton Status

A summary of all deliverables or tasks expected to be required under the future Massachusetts Permit, based on New Hampshire's Draft Permit are provided in Table 1-2 below. How each component is addressed by this Master Plan is described.

Table 1-2
Submittal Requirements: NH MS4 General Permit (basis for MA General Permit)

Document/Activity	Due Date (from effective date of permit)	Description	Addressed in Canton's Stormwater Master Plan Y/N (section #)
Notice of Intent	90 days	Template/menu-driven form simplifies filing for control measures associated with MEP Elements (6 MCMs); does not require specific information at this time regarding water quality-based effluent limitations (see MS4 SWMP). Must have ESA and Historic Property eligibility confirmed prior to NOI certifications.	Y – all information necessary to complete NOI is provided in the Stormwater Master Plan (multiple sections).
Stormwater Management Program (SWMP)	1 Year	Essentially compilation of documentation required to meet all terms of the permit. Note: although documentation for ESA and Historic property eligibility is not required until rest of SWMP is due at end of Year 1, in order to sign/certify NOI, permittee must know that they are eligible under those programs. Therefore, assume this component of SWMP also has a 90 day due date.	Partial – most of the information necessary to complete required Year 1 documentation is provided in, or appended to, the Stormwater Master Plan (multiple sections.) Water Quality Response Plans are <u>not</u> currently within any planned scope of services.
Report on measures instituted to meet TMDL requirements (if applicable) • Enhanced Water Quality Response Plan (bacteria) • Phosphorus Control Plan (P)	1 Year Years 1 - 5	For communities that discharge to a water body with an approved TMDL only. The components of each plan are described in the permit. Bacteria TMDLs must be addressed in an enhanced WQRP. There are no specific requirements to reduce nitrogen loads but permittees must track loads and reductions. The PCP is the most significant effort. Attachment F of the permit describes how baseline phosphorus loads were determined and how reductions based on BMPs will be calculated. Results of the PCP will be reported on a quantitative basis and must be calculated and reported annually.	Partial – see note above. WQRP will be required for Neponset River, Ponkapog Brook and Pecunit Brook.
Water Quality Response Plan	1 Year	Must include source identification for potential pollutants of concern, BMP selection and rationale, implementation schedule (including funding, training, purchasing, construction, monitoring, and other assessment and evaluation components of implementation) and description of monitoring or other	N – see note above.

Table 1-2 Submittal Requirements: NH MS4 General Permit (basis for MA General Permit)			
Document/Activity	**Due Date (from effective date of permit)**	**Description**	**Addressed in Canton's Stormwater Master Plan Y/N (section #)**
		assessment and evaluation efforts.	
Final Source Identification and Assessment Report	3 Years	Must be submitted with Year 3 Annual Report. This is the finalization of the preliminary source identification provided in the Year 1 WQRP, and the deliverable associated with Phase 2 of impaired waters iterative approach.	N
Reassessment of BMP's report	4 Years	First deliverable associated with Phase 3 of impaired waters iterative approach.	N
Prospective BMP's Report	5 Years	Second deliverable associated with Phase 3 of impaired waters iterative approach. This report will identify additional or modified BMPs proposed to improve results and achieve pollutant reductions.	N
Description of Public Education Efforts	1 Year	Provided in SWMP.	Y (Section 2.1.1)
Description of Public Participation Efforts	1 Year	Provided in SWMP	Y (Section 2.1.2)
Outfall Inventory	2 Years	Complete inventory of 25% of outfalls each year of the permit beginning in year 2.	Y (Section 2.1.3) This will be part of IDDE investigations.
SSO inventory	120 days	Must develop the inventory of known SSOs occurring within past 5 years within 120 days of permit and document activities annually.	N
Storm Sewer System Map	2 Years	Map must include entire system (pipes, open channels, CB, MH, outfalls, BMPs and interconnections to other MS4s) and include catchment delineations	Y (Section 2.1.3) Additional mapping is part of proposed Year 2 Asset Management Program.
Written IDDE Program	1 Year	This should have been completed under 2003 permit so should not be huge extra effort to include the additional elements. This will include priority ranking catchments, screening and sampling procedures, catchment investigation procedures, etc.	Y (Section 2.1.3)
IDDE Implementation • Dry Weather Sampling • Outfall investigations (as necessary) • Catchment investigations	3 Years 15 Mos 3 Years	Must complete dry weather sampling by Year 3. May be exempted from this if previous inventory under 2003 permit qualifies. Investigations of suspect outfalls must begin immediately upon completion of written procedures development and no later than 15 months after permit effective date. Complete 80% of Problem Catchments within 3 years and 100% of Problem Catchments within 5 years. There are various other	Y (Section 2.1.3) Implementation is part of proposed Year 2 IWRMP Implementation Plan.

Table 1-2 Submittal Requirements: NH MS4 General Permit (basis for MA General Permit)			
Document/Activity	**Due Date (from effective date of permit)**	**Description**	**Addressed in Canton's Stormwater Master Plan Y/N (section #)**
		percentages per type of catchment priority ranking. 100% of all catchments must be investigated within 10 years.	
Site Inspection Procedures and ESC measures/Site Plan Review/Waste Control	1 Year	Construction site controls – much of these should have been implemented through 2003 permit term.	Y/Partial (Section 2.1.4) Waste Controls must be addressed.
Estimate of impervious and directly connected impervious cover	2 Years	Permittee is required to estimate and update the baseline values of impervious area and directly connected impervious area. Must be completed by the end of Year 2 and updated annually.	Y / Partial – see Section 2.1.5 methodology and analysis of baseline was documented. The analysis will need to be updated when Permit issued.
Inventory and priority ranking of MS4-owned properties that may be retro-fitted with BMPs	3 Years	Permittee must complete detailed inventory of MS4 owned properties to determine if they are suitable for retrofits and rank them according to various criteria.	Y (Section 2.1.5)
Local ordinances, design guidelines review	Variable (Years 2 -3)	Permittee must review existing zoning, design standards and management practices to determine if there are changes necessary or indicated for improved implementation of LID and other green infrastructure practices appropriate to the community.	Y (Section 2.1.5)
Written O&M procedures for parks and open space, buildings and facilities, and vehicles and equipment.	1 Year	This is similar to 2003 permit requirements. An inventory of the facilities subject to the O&M procedures must be developed within 6 months of the effective permit date.	Y (Section 2.1.6)
Written program for Infrastructure O&M	1 Year	This program must address things like catch basin cleaning and street sweeping and meet criteria established in the permit regarding frequency, prioritization, volume of material, winter road maintenance and waste management.	Y (Section 2.1.6)
Stormwater Pollution Prevention Plan (SWPPP) development	2 Years	Municipalities must have SWPPPs in place within 2 years of the permit effective date for MS4-owned and operated maintenance garages, public works yards, transfer stations and other waste handling facilities (WWTFs should already have a SWPPP in place).	Y (Section 3)

The Draft NH MS4 permit does not "require" a funding mechanism to achieve compliance however the permittee "is encouraged to maintain an adequate funding source for the implementation of the program." This component is addressed below in Section 1.5 of this Master Plan.

Additional information relating to the proposed new permit includes the following areas:

- EPA may offset the publication date and effective date of the permit (by as long as 6 months but possibly shorter) to provide an opportunity for municipalities to sync up their fiscal and regulatory planning periods;
- Some reporting templates are under development to simplify annual reporting and required submittals;
- Monitoring requirements are under review and may be scaled back to try and integrate better with the Illicit Discharge Detection and Elimination (IDDE) requirements. Wet weather sampling may be reduced to those outfalls identified as possible "system vulnerabilities;"
- Some of the municipal operation requirements cited in the draft may be revised in order to allow greater latitude at the local decision-making level;
- The Phosphorus Control Plan requirements are being re-evaluated and EPA is working on development of a Best Management Practice (BMP) calculator that will clarify where pollutant reduction credits can be gained under the program; and,
- Impaired waters and anti-degradation language will be clarified.

For Canton and other regulated communities, the greatest concern expressed through written comment and public hearings is the potential cost associated with capital projects necessary to achieve the pollutant load reductions stipulated under Total Maximum Daily Load (TMDL) requirements that are embedded in the permit. Possible avenues for development of a sustainable funding mechanism capable of providing the necessary revenue to implement capital improvements are explored in greater detail in Section 1.5.

1.5 Sustainable Funding Options

In Spring 2014, the Town of Canton completed a Stormwater Utility Feasibility Study funded by a Sustainable Water Management Initiative (SWMI) grant administered by the Massachusetts Department of Environmental Protection. The results of the study were presented in a final report entitled *Stormwater Utility Feasibility Analysis,* dated June 27, 2014. The executive summary of this report is provided as Appendix C to this Stormwater Master Plan.

As described in the report's Executive Summary, the study was conducted with the goal of obtaining a local consensus on Canton's current and future stormwater management program needs and to determine the viability of establishing a stormwater utility as a method to fund this program. During this study, two (2) workshops were held with local stakeholders to review and evaluate information pertaining to stormwater management in Canton.

There are several reasons why Canton needs to enhance its existing stormwater program with flooding and erosion, drinking water preservation and wetland/wildlife preservation being the key drivers identified by the participants during the two (2) workshops. Canton currently spends about $767,000 annually on stormwater management activities; however, the Town is facing real, unresolved, and growing stormwater problems that it cannot address with its current level of service and level of funding. Future demands driven by the anticipated new Phase II permit and existing infrastructure maintenance and repair needs are projected to increase the level of service and the resultant cost for the stormwater program to about $1.38M annually. A

stormwater utility is being considered as a funding option because it would: provide dedicated revenue solely for the stormwater program; consolidate/coordinate responsibilities; and allow for development of a more comprehensive and predictable program. A stormwater user fee distributes the cost for public stormwater services based on a property's estimated contribution to the stormwater system, not on property value, which is considered a more equitable way to distribute costs than most other funding methods.

Currently Canton is exploring the potential for implementation of a utility; however, there are multiple funding options which have been typically employed by communities in the past. Some of these are outlined in Table 1-3, including Canton's current tax-based funding approach.

Table 1-3
Summary of Common Stormwater Funding Mechanisms

Taxes	Most general purpose local governmental functions are primarily funded through taxes. The purpose is to defray the expenses of general government, as distinguished from the expense of a specific function or services. It is not necessary that a tax have a demonstrable association with any particular purpose or function.
Bonds and Grants	Bonds involve borrowing money and accruing debt. While they may be useful for major capital projects, they are not a stable source, and subject to annual vote. Grants are competitive and criteria specific, which may limit their availability or applicability to need.
Special Assessment	A special assessment must confer some direct benefit to the property assessed, as the assumption for the assessment is the premise that it improves the value of the property. They may be based on property value or other factors such as street frontage. Assessments typically have a specific purpose and therefore may have some limitation in terms of how the dollars are applied within a program.
Service Fee/Utility	These fees provide the funds to provide services and facilities, or basically to recover the costs associated with provision of services. The utility must adopt a service charge rate methodology that equitably assigns appropriate fees or charges.

The Town's consultant conducted a preliminary evaluation of Canton's program needs and available data to provide the Town with an idea of what a stormwater utility could look like for Canton. Based on the feedback given at Stormwater Utility Workshop #2, a three-tiered Stormwater Billing Unit (SBU) rate structure may be most appropriate for Canton, with a SBU of approximately 1,700 square feet of impervious area (IA). Based on the analysis conducted for this study, in order to achieve the projected $1.38M under the tiered SBU-based rate structure the monthly rate would be somewhere between $2.95 and $3.50 per SBU. Using the upper end of the range for discussion purposes, single family residential properties that fall within Tier I (small), Tier II (medium) and Tier III (large) would be paying a monthly rate around $3.50, $7.00 and $10.50, respectively. Fees for non-residential properties would be calculated by dividing

their total IA by the SBU and multiplying that number by the fee for Tier I (i.e. a retail property with 17,000 square feet of IA would be equivalent to 10 SBUs and pay $35/month). The $3.50 per SBU rate would generate approximately $1,635,600 annually, which would cover projected future needs and provides contingency for revenue decreasing factors such as credits and bad debt. The general consensus following the workshops was that a stormwater utility may be a good option for the Town of Canton in the future, but that the Town was not ready for it immediately.

The participants felt that, in general, the public and Board of Selectmen need a better understanding of the current and future program needs. Once they better understand the need then options for funding the stormwater program should be presented, including a stormwater utility option.

The following steps were recommended based on the results of the feasibility study:

- implement a strong public education program for citizens, stakeholders, and decision makers so they better understand the current and future stormwater program needs as well funding options including a stormwater utility,
- continue refinement of future needs and costs,
- update the Town's GIS data and capability, and
- continue to involve key stakeholders and decision makers in the stormwater utility feasibility process.

Several of these elements have already been included in program elements further described in **Section 2** of this Master Plan.

2. NPDES MS4 STORMWATER MANAGEMENT PLAN (MS4 SWMP)

2.1 MS4 SWMP Required Content

Control measures to achieve the "maximum extent practicable" (MEP) are described in detail in Section 2.2. Other SWMP required content includes the following information:

- The individual with overall responsibility for implementation of the Town's MS4 program is Michael Trotta, Superintendent/Department of Public Works. In addition, other Town of Canton personnel with responsibility for specific areas of compliance have been noted in the appropriate sections herein.

- A matrix providing a listing of all outfalls within the Town and their associated receiving water bodies is provided in Section 3 of the IDDE appended to this Master Plan. A listing of impaired waters, source of impairments and applicable TMDLs is provided in Table 1-1, Section 1 of this Master Plan. The Town obtains drinking water through groundwater sources which are not threatened by MS4 discharges.

- At this time, the Town is aware of only one other MS4 permit holder in the Town of Canton (the Massachusetts State Hospital School). As documented in the IDDE Plan, the Town will investigate its drainage system near the MSHS to determine if there is a physical connection with Canton's MS4.

- Documentation regarding endangered species and eligibility under the General Permit will be generated upon publication of the final permit. The Town is currently eligible under the 2003 MS4 General Permit, and anticipates eligibility under the pending permit.

- Documentation regarding historic properties and eligibility under the General Permit will be generated upon publication of the final permit. The Town is currently eligible under the 2003 MS4 General Permit, and anticipates eligibility under the pending permit.

- The Town of Canton is included in the list of communities that contain waters subject to an approved TMDL for bacteria or pathogens (Section 2.2.1(b)(iii) of the 2014 Draft MA MS4 General Permit). Documentation regarding the additional or enhanced BMPs required to address these impairments are described more fully in the appropriate Section 2.2 sub-sections below.

- The Town of Canton is included in the list of communities that own or operate an MS4 that discharges to a water body (or its tributaries) impaired for phosphorus. Documentation regarding the additional or enhanced BMPs required to address these impairments are described more fully in the appropriate Section 2.2 sub-sections below. The required Phosphorus Source Identification Report, and Structural BMP Report will be generated within the respective required development periods, as stipulated in Section 2.2.2 (b)(ii) of the 2014 Draft MS4 permit.

2.2 Components of Compliance – The Six Minimum Control Measures

Small MS4s are required to develop stormwater management programs designed to reduce discharge of pollutants to the "maximum extent practicable," protect water quality, and comply with the applicable water quality provisions of the Clean Water Act. The Stormwater Phase II Final Rule program is defined by EPA as a program comprised of six Minimum Control Measures to be implemented together, thereby significantly reducing inputs of pollutants into receiving waters. The six Minimum Control Measures are:

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

The Town's progress to date (current status) and proposed continuing program relating to the six Minimum Control Measures (MCM) are discussed individually in separate sections of this MS4 SWMP. Within each MCM is a review of activities and programs already in place or under development within the Town contributing to compliance, as well as a listing of additional activities and initiatives recommended for compliance and/or further progression of the program. Under each MCM section, Canton's compliance status is summarized and visually indicated with the use of color coded headings as follows:

Compliance Status: Green indicating fully compliant
Compliance Status: Yellow indicating partially compliant, requires re-assessment
Compliance Status: Red indicating non-compliance, requires action

An Excel Compliance Tracking Log workbook has been created to allow Canton to track and log its required activities. This will help to facilitate annual reporting to EPA. The Tracking Log is provided in Appendix D of this report.

Section 1 of the Stormwater Master Plan document provided the framework for the program development in terms of environmental and regulatory context, and efforts to date to establish a sustainable funding mechanism.

2.2.1 Minimum Control Measure 1: Public Education & Outreach

2.2.1.1 Rationale

The Public Education and Outreach Minimum Control Measure is based on the principle that an informed and knowledgeable community is crucial to the success of a stormwater management program. Not only will an informed public more likely adopt the behavioral changes required to promote improved land use stewardship, but it will create the political will to establish the sustainable revenue mechanism that will support the development and operation of the drainage infrastructure in perpetuity.

The EPA NPDES Stormwater Phase II program recognizes that an understanding of the problems created by non-point source pollution is the single most important element in reducing pollutant loads to local water bodies. This Minimum Control Measure focuses on public

understanding of both the causes of and solutions to stormwater pollution, since the support of the members of the community is crucial to both curtail individual activities contributing to non-point source pollution and to provide community-wide behavioral and financial support to the various approaches implemented to improve management of stormwater discharges. The results of effective public education and outreach are:

- Greater support for the program as the public gains a greater understanding of the reasons why it is necessary and important. Public support is particularly beneficial as communities move to institute new funding initiatives for the program (see Section 1.5) and/or seek volunteers to help implement the program; and
- Greater compliance with the program as the public becomes aware of the personal responsibilities regarding individual actions they can take to protect or improve the quality of local water bodies.

2.2.1.2 General Approach

Responsible Agency/Person: Department of Public Works/DPW Superintendent Michael Trotta

Goals for the MCM: Development and dissemination of required targeted messages; measure of effectiveness defaults to 100% execution of message dissemination.

In general, the focus of this Minimum Control Measure under the existing 2003 General Permit, and as anticipated to continue under the proposed new draft permit, is to distribute educational materials and to conduct outreach activities regarding stormwater impacts and ways the public can help mitigate them. Emphasis is placed on providing pertinent information to specific audiences related to the types of pollutants typical for the land uses and material storage/use protocols that audience is likely to encounter or practice. The Town of Canton has successfully implemented elements of the MCM over the course of the past permit term. The Department of Public Works has been the lead agency responsible for MCM implementation, and is anticipated to continue that role under subsequent permit terms. Any changes to the assigned responsible party will be reported under appropriate reporting protocols. Town DPW Director Michael Trotta has cited the importance of this MCM in the overall success of the stormwater management program. Specifically, he recognizes that the tangible and direct benefits to residents are not as transparent (nor the costs so neatly quantified) as the benefits of improved potable water or wastewater infrastructure to which the residents relate as "consumers." To successfully maintain the public education and outreach program, and advance the mission to better inform residents of program costs and benefits, three action areas are recommended. These are to:

1. *Continue to Engage Private Partnerships*: Canton has been working with Neponset River Watershed Association (NepRWA) successfully over the past several years. Most recently, the Town partnered with NepRWA (website accessed here) to implement a water resource lesson plan in Canton elementary schools. Non-governmental organizations (e.g., environmental, civic, and industrial organizations) have been and continue to be invited to participate with the Town in the development and dissemination of educational materials and/or are performing outreach activities.

Compliance Status*: Implementation of this strategy established compliance with existing permit terms; continuation of this strategy will maintain compliance under anticipated future permit conditions.*

2. *Leverage Existing Educational Materials and Strategies*: The Town has independently created as well as adopted stormwater educational information already created by the State, EPA, or environmental, public interest, or trade organizations. Both the Neponset River Watershed Association and the Central Massachusetts Stormwater Coalition (www.neponset.org and www.centralmastormwater.org, respectively) have websites that provide useful educational materials. The materials and activities are relevant to local situations and issues and have incorporated a variety of strategies to ensure maximum coverage. Water users in particular have been targeted through landscaping and outdoor water use brochures included as part of Spring water bills. A copy of the most recent water bill stuffer can be found here . Appropriate alternative strategies will be considered as specific audiences are targeted over time.

   Based on the 2014 MS4 Draft Permit, the Town will be required to focus their message to residential audiences due to the existing TMDL for the Neponset River Basin, and residential and business/commercial/institutional audiences due to discharges to receiving waters with phosphorus impairment (without an approved TMDL). The messages to residents must address lawn care (responsible use of fertilizers and pesticides); benefits of on-site infiltration of stormwater; potential deleterious effects of car washing on water quality, proper disposal of pool water and pet waste management. Phosphorus message content must address proper use and disposal of grass clippings and encourages the proper use of slow-release and phosphorous-free fertilizers. In addition, the Town is required to provide educational material to dog owners at the time of issuance or renewal of dog licenses, or other appropriate times as determined and documented by the Town. Downloadable and publicly available free materials addressing these topics specifically can be found at the links above. In addition, a repository of materials is provided in the Stormwater Master Plan Reference Library included as a subfolder to the electronic version of this document.

Compliance Status: *Implementation of this strategy established compliance with existing permit terms; continuation of this strategy will maintain compliance under anticipated future permit conditions*.

3. *Reach Diverse Audiences*: The public education program must include outreach efforts to four specific audiences including residents, businesses (including institutions and commercial facilities), developers and industrial facility operators. Based on anticipated permit conditions, the Town will be required to distribute a minimum of two educational messages over the permit term to each audience. This is equivalent to eight messages over the 5-year permit term. The material already developed may be re-purposed as content for the targeted audiences. In addition, the agencies and organizations cited above have created messages appropriate to other audiences. Please visit the referenced websites for further information on available content. Representative content for residential audiences was described above. Other audiences and topics must include:
   - Business/Commercial – proper lawn maintenance, benefits of on-site infiltration of stormwater, building maintenance, use of salt or other de-icing materials, proper storage of materials and waste, parking lot maintenance and proper disposal of swimming pool water.

- Developers/Construction – proper sediment and erosion control practices, information on low-impact development (LID) principles, and information on construction permitting. This may be combined with requirements under construction site stormwater run-off controls required under MCM 4.
- Industrial Programs – maintenance of fleet vehicles, storage of materials and waste management, minimization of use of salt or other de-icing materials, and parking lot maintenance.

The manner in which the content is conveyed should demonstrably be appropriate for the audience intended. The effort can include printed material, electronic material such as websites, mass media such as newspaper articles or public service announcements are presentations at audience-specific events. As an example, developers can be provided educational material as an insert with planning board site plan review applications (hard copy) or a link can be provided on the Planning Board web page from which applications might be downloaded. This activity would constitute one message to the intended audience (developers). Goals to be achieved, the metrics to determine if the goals are met, and the extent to which they are demonstrating effectiveness of the message must be identified and reported upon. Documentation should be maintained regarding message type, audience, message content, date(s) of implementation and basis for measuring progress to meet defined goals. An Excel spreadsheet is provided in Appendix D for use by the Town. Ultimately, it is the Town's intent to integrate documentation of tasks (demand, activity, resolution) for elements of the SWMP into the work order module of their Asset Management program software platform. Documentation of required activities and report-out templates for statutory reporting will be part of the final program deliverables.

A final component of this effort is not related to the permit, per se, but rather a recognition that additional outreach must be extended to political agencies and leaders within the community in order to achieve political consensus around the value of this program and the benefits accrued to the community. These efforts are generally more effect in face-to-face meetings or workshops where greater detail can be provided and technical depth explored.

***Compliance Status**: Current practices comply with existing permit conditions; implementation of the proposed strategy will establish compliance with anticipated future permit conditions.*

2.2.2 Minimum Control Measure 2: Public Participation & Involvement

2.2.2.1 Rationale

Minimum Control Measure 2, Public Participation and Involvement, is based on EPA's experience that the public can provide valuable input and assistance to a regulated small MS4's municipal stormwater management program and that the public must therefore be given opportunities to play active roles in program development and implementation. An active and involved community offers the following benefits to the success of a stormwater management program:

- Broader public support since citizens who participate in the development and decision-making process are partially responsible for the program and therefore are typically less likely to raise legal challenges to the program and more likely to take an active role in its implementation;

- Shorter implementation schedules due to fewer public and legal challenges and increased citizen volunteerism;
- Broader base of expertise and economic benefits since community input offers valuable (and free) intellectual resources; and
- Conduit to other programs as citizens involved in the stormwater program development process provide important cross-connections to and relationships with other community and government programs. This benefit is particularly valuable when implementing stormwater management programs at regional or watershed levels.

2.2.2.2 General Approach

Responsible Agency/Person: Department of Public Works/Superintendent Michael Trotta

Goals for the MCM: Meet threshold criteria for frequency of notifications and provision for access to stormwater program development and implementation by Town stakeholders; measure of effectiveness defaults to 100% execution of public notification requirements.

By means of careful compliance with public notification procedures, the public must be invited to participate in development, implementation and review of the stormwater management program. Though it has generally been the experience of land and water managers that significant challenges can be associated with public involvement, it has also been shown that these challenges can be mitigated through an aggressive and inclusive program. The Town of Canton has successfully implemented elements of the MCM over the course of the past permit term. The Department of Public Works has been the lead agency responsible for MCM implementation, and is anticipated to continue that role under subsequent permit terms. Any changes to the assigned responsible party will be reported under appropriate reporting protocols. To successfully maintain the public participation and involvement program, three action areas are recommended. These are:

1. *Comply with applicable State and local public notice requirements:* Canton complies with state public notice requirements (MGL Chapter 39 Section 23B) and makes the SWMP and all annual reports available to the public. This updated SWMP will be available at the DPW for review by all interested parties; annual reports are submitted to EPA and DEP and provided for viewing and download via the EPA website (here).

Compliance Status*: Implementation of this strategy established compliance with existing permit terms; continuation of this strategy will maintain compliance under anticipated future permit conditions.*

2. *Annually provide the public an opportunity to participate in the review and implementation of the stormwater management program:* Canton provides information about the stormwater program in a variety of forums, including continued activity with the NepRWA through shared program initiatives. In addition, the Town aggressively pursues grant funding when available, and most recently partnered with NepRWA to hold a public meeting to discuss the Sustainable Water Management Initiative, aspects of which relate to the stormwater program. In order to ensure future compliance with this obligation, we recommend that upon submittal of the required Annual Report to EPA (in the past, May 30th) the Town plan to present results of the year's activity and anticipated

activities for the upcoming year at a regularly scheduled Board of Selectmen meeting (or other appropriate venue) to solicit public input.

***Compliance Status**: Implementation of this strategy established compliance with existing permit terms; continuation of this strategy and adoption of an annual public report-out as described above will maintain compliance under anticipated future permit conditions.*

3. *Report on activities undertaken to provide public participation opportunities:* Canton reports all, or a representative sample, of activities undertaken to meet this obligation in annual reports to EPA and DEP about the SWMP program implementation.

***Compliance Status**: Implementation of this strategy established compliance with existing permit terms; continuation of this strategy will maintain compliance under anticipated future permit conditions.*

Goals to be achieved, and the metrics to determine if the goals are met must be identified and reported upon. Documentation should be maintained regarding activity, date(s) of implementation and basis for measuring progress to meet defined goals. The MS4 SWMP Compliance Tracking Log (Appendix D) can be used by the DPW to create the necessary documentation. As with MCM No. 1, the Town intends to integrate documentation of compliance with a finalized asset management program.

2.2.3 Minimum Control Measure 3: Illicit Discharge Detection and Elimination (IDDE)

2.2.3.1 Rationale

Discharges from stormwater management systems throughout urbanized areas have often included wastes and wastewater from non-stormwater sources. Illicit discharges can encompass those that are unlawful, prohibited, unauthorized, or improper. These flows are designated as “Illicit Discharges” because they consist of or contain materials the stormwater drainage system is not designed to treat, transport or discharge. Illicit Discharges are therefore considered by Federal regulations to be “...any discharge to an MS4 that is not composed entirely of stormwater…” There are particular exceptions to this definition, such as discharges from NPDES-permitted industrial sources and discharges from fire-fighting activities.

Illicit discharges enter stormwater systems through either direct connections (e.g., wastewater piping either mistakenly or deliberately connected to the storm drains) or indirect connections (e.g., infiltration from cracked sanitary systems, spills collected by drain outlets, or paint or used oil dumped directly into a drain). The untreated discharges then contribute high levels of pollutants to receiving water bodies (for example, heavy metals, toxics, oil and grease, solvents, nutrients, viruses, and bacteria). **Specific examples of illicit discharges include sanitary wastewater, effluent from septic tanks, car wash wastewaters, improper oil disposal, radiator flushing, laundry wastewaters, spills from roadway accidents, and improper disposal of auto and household toxics**. Pollutant levels from these illicit discharges have been shown to be high enough to significantly degrade receiving water quality and threaten aquatic, wildlife, and human health.

2.2.3.2 General Approach

Responsible Agency/Person: Department of Public Works/Superintendent Michael Trotta

Goals for the MCM: Execute upon the Plan detailed in the Town's Illicit Discharge Detection and Elimination (IDDE) Plan (Appendix A) within the timelines, and employing the strategies, described therein. Metrics employed to evaluate program progress and success in achieving plan goals for water quality protection are outlined in Section 7 of the IDDE Plan.

The general approach of this Minimum Control Measure entails development of a comprehensive understanding of the extent and operating conditions of the storm sewer system. This Minimum Control Measure also helps public and private entities as well as the general public to become aware of the system and their role in keeping its discharges clean. The illicit discharge detection and elimination program must therefore include inventory and mapping of the storm sewer system, inspection and detection activities, regulatory protection and enforcement, public education (part of Minimum Control Measure 1), and public involvement in reporting illicit discharges (contributes to Minimum Control Measure 2). More specifically, the program currently administered by the Town includes:

A storm sewer system map showing the location of all outfalls and the names and location of all waters of the United States receiving discharges from those outfalls, and which includes a large percentage of the manholes and catch basins within the system, and a moderate percentage of piping throughout the system;

An Illicit Discharge Detection and Elimination (IDDE) plan to detect and address non-stormwater discharges into the stormwater management system, including illegal dumping;

A bylaw prohibiting non-stormwater discharges into the storm sewer system, including appropriate enforcement procedures and actions;

Education of public employees, businesses, and the general public about the hazards associated with illegal discharges and improper disposal of waste; and

It is important to note that not all illicit discharges must be addressed, unless the discharges are specifically identified as significant pollutant sources. The following categories of discharges do not need to be addressed:

Exempt non-stormwater discharges:

Water line flushing	Landscape irrigation	Diverted stream flows
Rising ground waters	Uncontaminated groundwater infiltration	Uncontaminated pumped ground water
Discharges from potable water sources	Foundations drains	Air conditioning condensation
Irrigation water	Springs	Water from crawl space pumps
Footing drains	Lawn watering	Individual residential car washing
Flows from riparian habitats and wetlands	Dechlorinated swimming pool discharges	Street wash water

2.2.3.3 Current Program and Specific Recommendations

2.2.3.3.1 Mapping

The Town of Canton has developed a GIS-based storm sewer map that identifies all known outfalls and receiving water bodies associated with the Town's MS4 system. In addition, the map includes a percentage of catch basins and manholes in addition to some piping. Some of the piping is interpolated based on surface features such as manholes, etc., and some portion of the piping is based on existing record drawings. The Town continues to improve their mapping on an incremental basis. The IDDE program includes recommendations for capturing data and updating GIS databases appropriately.

Compliance Status: The existing mapping complies with the current (2003) MS4 General Permit. Under the proposed Draft permit, the entire system, including all catch basins, manholes, piping, connections to adjacent towns and other components of the system must be mapped within 2 years of the effective date of the permit. Under the field activity (mapping, condition assessment and illicit discharge detection activities) proposed for future phases of the IWRMP, this mapping requirement can be achieved. Implementation Years 2 and 3 of the Asset Management Program should include scope items that ensure permit timelines for this requirement are met.

2.2.3.3.2 Illicit Discharge Detection and Elimination Program

The Town has developed an IDDE Program encapsulated in their IDDE Plan which is appended to, and a part of, this SWMP. The IDDE plan is based on EPA guidance documents, recognized best management practices and stipulations in the existing and proposed draft MS4 general permit. The IDDE plan describes the legal authority, program protocols, and the delineation and prioritization of catchments. It provides a description of the systematic procedure conducted by the Town to identify and eliminate illicit discharges and details indicators of program progress. Achievements of the program are detailed in annual reports.

Compliance Status: The Town's previous program was based in large part on protocols that met industry standard of care and are compliant with the 2003 MS4 General Permit. The Town's recently completed IDDE Plan meets that standard and additionally incorporates requirements outlined in the 2010 Draft MS4 permit. Requirements under this MCM are not anticipated to change significantly in subsequent versions of the permit and the Town will remain in compliance with this MCM as currently implemented. Prioritization of catchments for investigation is a dynamic process, and based either on findings from field investigations or changing regulatory requirements, the IDDE plan will be updated and executed upon in conformance with best practices. A Compliance Tracking Log is provided in Appendix D for tracking the completion of requirements of the IDDE Plan.

2.2.3.3.3 Enforcement

Article XVI (Miscellaneous), Section 16 of the Town of Canton General By-Laws (Consolidated Drainage By-Law) provides the necessary enforcement authority for the Town to administer their responsibilities under the MS4 General Permit with specific reference to location and elimination of illicit discharges. The By-Law is provided as an appendix the IDDE Plan in Appendix At.

Compliance Status: The by-law under which the Town is currently enforcing prohibition of non-stormwater discharges complies with requirements under the existing (2003) MS4 general permit and with additional stipulations included with the 2010 Draft MS4 general permit. Although the by-law does not explicitly include the timelines for correction of identified illicit discharges, the language of the by-law, which requires "immediate" termination of the lillicit connection or discontinuance of illicit discharges, is more restrictive than the language of the permit. No further modifications of the existing by-law are anticipated to be required.

2.2.3.3.4 Sanitary Sewer Overflow (SSO) Inventory

Although not technically part of the IDDE program, under the MS4 permit, Canton is required to develop and maintain a sanitary sewer overflow (SSO) inventory. Discharges from SSOs to the MS4 are prohibited and constitute a violation of the permit. The inventory must include all known locations where SSOs have discharged to the MS within the previous 5 years. An Excel spreadsheet Compliance Tracking Log has been included in Appendix D that includes the information required per the permit. The inventory must be maintained as part of the SWMP. The Asset Management Work Order Module, when implemented, can be used to track identification, resolution and documentation of this activity in the future.

2.2.4 Minimum Control Measure 4: Construction Site Runoff Control

2.2.4.1 Rationale

Minimum Control Measure 4 requires the Town of Canton to develop, implement, and enforce a program to reduce pollutants in stormwater runoff to their MS4 from construction activities that result in land disturbance of greater than or equal to one acre. In general, sediment is the main pollutant of concern. Polluted stormwater runoff from construction sites often flows to MS4s and ultimately is discharged into local rivers and streams. Sediment runoff rates from construction sites have been shown to be typically 10 to 20 times greater than those of agricultural lands, and 1,000 to 2,000 times greater than those of forest lands. During the relatively brief construction period, construction sites can therefore contribute more sediment to streams than can be deposited naturally over several decades. Sediment also tends to be a carrier of other pollutants, including oils, various construction activity fluids, and a wide variety of other pollutants. Uncontrolled siltation from construction sites causes physical, chemical, and biological harm to receiving waters.

Even though all construction sites that disturb more than one acre are covered nationally by an NPDES Stormwater Permit, Minimum Control Measure 4 is needed to induce more localized site regulation and enforcement efforts, and to enable operators of regulated small MS4s to more effectively control construction site discharges into their MS4s.

2.2.4.2 General Approach

Responsible Agency/Person: Canton Conservation Commission/Conservation Agent Cynthia O'Connell

Goals for the MCM: There are two primary goals for this measure: (1) to minimize or eliminate erosion and maintain sediment on construction sites in order to preclude conveyance and discharge of sediments through the MS4; and (2) establish site plan review procedures that encourage the use of low impact design and green infrastructure. The latter goal is integral to post-construction stormwater management controls as well. The goal for the Town's program is

to achieve these objectives through existing regulatory mechanisms (discussed below) and education of the development community through outreach efforts detailed in MCM No. 1. Metrics to establish effectiveness of program goal (1) will be based on total number of developers/contractors contacted, percentage of new construction sites (within by-law jurisdiction) visited and number of violations noted. Program goal (2) effectiveness will be evaluated on the basis of percentage of approved plans that incorporate LID or green infrastructure components. A Compliance Tracking Log has been provided in Appendix D to facilitate tracking purposes.

Article XX of the Canton General By-Laws (Soil Erosion and Sediment Control) provides the basis for the Town's construction phase stormwater controls. A copy of the by-law is provided as Appendix E of this SWMP. The by-law creates jurisdiction over land disturbing activity that equals or exceeds 5,000 square feet. The limited permit covers activity that disturbs from 5,000 – 20,000 square feet. A full permit covers activity for land disturbance of greater than 20,000 square feet. Permit application requirements include detailed information regarding erosion and sediment controls and a certificate of compliance upon satisfactory completion of permitted activities. The by-law additionally requires that the Conservation Commission provide the public with information, through workshops and seminars, about the value of sedimentation and erosion controls, which satisfies a component of the existing and proposed MS4 permit regarding engagement with the public.

Written procedures for site plan review are provided in Section 10.5 of the Town's Zoning By-Law provided as Appendix F. Larger-scale development is regulated by the Planning Board Rules & Regulations for subdivision development. The development process for the Town is generally described in the Town of Canton Development Handbook.

2.2.4.3 Current Program and Specific Recommendations

2.2.4.3.1 Regulatory Mechanism (By-Law)

The Town's current by-law (Article XX of the Canton General By-Laws) addresses the primary requirements of the existing and proposed Draft MS4 general permit. The by-law as written allows significant discretion by the Conservation Commission to determine "if any structural soil erosion and sediment control is deemed necessary" without reference to established design standards. This may prove problematic for applicants unfamiliar with the Town's site control preferences. Since the by-law establishes the necessary legal authority to enforce the erosion and sediment controls required under the MS4 General permit (existing and 2010 Draft), it would be easier for the Town to promulgate design standards or administrative matters through associated implementing rules and regulations. This will allow the Town to modify regulations rather than go through the more administratively rigorous by-law amendment process.

Compliance Status: The Town's current by-law adequately addresses existing and proposed MCM requirements.

2.2.4.3.2 Inspection Procedures

The proposed MS4 permit requires the Town to have written procedures for site inspections and enforcement of the existing by-law. The by-law does include an inspection provision and

enforcement authority to enter subject sites. The Conservation Commission is the enforcement authority under the by-law.

Compliance Status: The existing by-law meets the minimum requirements of the 2010 Draft MS4 general permit, although without significant detail regarding inspection procedures. As suggested above, the Town may choose to promulgate rules and regulations pursuant to the by-law in which these details are outlined. The Town should adopt a mechanism to allow for tracking and reporting on inspections so that MCM goals can be met. It is recommended that the Town use an SOP and Inspection Reporting Form such as the one developed by the Central MA Stormwater Coalition. Ultimately, as with other tracking mechanisms, the Town intends to incorporate tracking metrics via the VueWorks work order module to be incorporated into the Town's Asset Management system.

2.2.4.3.3 BMP Selection

The 2010 & 2014 Draft MS4 general permits includes a requirement that an erosion and sediment control plan "shall be required" of subject construction site operators and it "may" include references to BMPs appropriate for the conditions at the site. The Town's by-law does include a section (Section 14. Stabilization), wherein some specific stabilization measures are cited. In accordance with suggestions above, the Town may choose to include further guidance or design-related documentation in rules and regulations rather than the by-law itself.

Compliance Status: The program as it stands is compliant; however, if and when the Town chooses to promulgate rules and regulations pursuant to the by-law, BMP design standards should be included.

2.2.4.3.4 Control of Construction Wastes

The Town's by-law does not explicitly require construction site operators to control wastes resulting from development activity. Although this is a standard part of a Stormwater Pollution Prevention Plan, it is not included as part of the Town's E&S program. We suggest that the Town include such language in future rules and regulations pursuant to the by-law. The draft permit does not provide for a timeframe in which this must be achieved, but simply states it must be part of the program. Consequently, we suggest that this modification (and development of the rules and regulations in general), be undertaken during 2015.

Compliance Status: The construction site run-off controls program must include requirements for site operators to control waste. This is not specifically cited in the current by-law language.

2.2.4.3.5 Site Plan Review Written Procedures

The 2010 Draft MS4 general permit requires that the Town have written procedures for site plan review and specific criteria relating to protection of water quality through construction and into post-construction management. The Town does have such written procedures which are detailed in Stormwater Regulations promulgated pursuant to Article 21 – Stormwater Management of the Town of Canton General By-Laws.

Currently the Town tracks site reviews through records maintained by the Conservation Commission, the enforcement authority for the respective by-laws related to stormwater controls. Ultimately, these records will be incorporated into the asset management database through the task order module to be adopted in future AM/IWRMP phases.

Compliance Status: The Town's regulations detail procedures for site plan review as described in the draft permit. If the eventual final permit modifies requirements, such modifications can be made relatively easily to the existing written procedures.

2.2.5 Minimum Control Measure 5: Post Construction Runoff Control

2.2.5.1 Rationale

The Phase II Final Rule requires an operator of a regulated small MS4 to develop, implement, and enforce a program to reduce pollutants in post-construction runoff to their MS4 from new development and redevelopment projects that result in land disturbance of greater than or equal to one acre. Many studies indicate that prior planning and design for the minimization of pollutants in post-construction stormwater discharges is the most cost effective approach to stormwater quality management. This is best accomplished through combined good municipal planning with thorough project review during the proposal and permitting stages. Note that most construction projects will also pass through review under the criteria already established by the DEP's Stormwater Management Standards, within which an Operations and Maintenance Plan addressing ongoing stormwater management is required. However, this Minimum Measure will provide protection of the Town's waters both in the contexts of additional layers of attention through this and other Minimum Measures, and through review of projects proposed outside areas under jurisdiction of the Massachusetts Wetlands Protection Act.

Post-construction runoff can generate two principal types of pollutants. The first is an increase in the type and quantity of pollutants in stormwater runoff. As runoff flows over areas altered by development, it can pick up harmful sediment and chemicals such as oil and grease, pesticides, heavy metals, and nutrients (e.g., nitrogen and phosphorus). These pollutants often become suspended in runoff and are carried to receiving waters, such as lakes, ponds, and streams. The second occurs by increasing the rate of runoff delivered to the water body during storms. Instead of rainfall absorption into the soil via the natural cycle of gradual percolation, stormwater is quickly shed by paved surfaces and compacted soils and routed to drainage systems where large volumes of runoff quickly flow to the nearest receiving water. The effects of this process include streambank scouring and downstream flooding, often leading to degradation of aquatic ecosystems and damage to property.

2.2.5.2 General Approach

Responsible Agency/Person: Planning Board/Karen Lawlor Administrative Assistant

Goals for the MCM: In order to achieve objectives of the MCM, the Town will endeavor to modify policies, regulations or guidance to allow new development to employ low impact development techniques and/or green infrastructure prior to the end of the permit term.

2.2.5.3 Current Program and Specific Recommendations

2.2.5.3.1 Regulatory Mechanism (By-Law)

The Town's current Stormwater Management by-law meets the obligations of the 2003 MA MS4 General Permit and substantially meets requirements of the Draft NH MS4 General Permit (analysis template as referenced previously) and 2014 MA Draft MS4 permit. The most significant difference between the NH template and the 2014 MA Draft MS4 permit is the **requirement to retain the first one (1) inch of runoff from all impervious surfaces on site, or provide the level of pollutant removal equal to or greater than the level such retention would provide.** Other procedures include ensuring that any stormwater controls or management practices for new development and redevelopment will prevent or minimize impacts to water quality. These procedures include requirements to avoid disturbance of areas susceptible to erosion and sediment loss; requirements to preserve areas in Canton that provide important water quality benefits; requirements to implement measures for flood control; and requirements to protect the integrity of natural resources. Other than the one-inch retention provision, the only stipulated requirement not included under the current by-law and implementing regulations is the submittal of as-built drawings to the Town upon completion of structural BMPs at development sites.

Compliance Status: Currently compliant; language to require as-builts should be included in modified implementing regulations. It is the Town's intent to require that as-built drawings be provided in electronic format as AutoCAD or ArcGIS files, and to develop specific technical standards for those submittals. This practice will allow the data contained in the drawings to be captured and added to the Town's GIS and VueWorks asset management system in a vastly more cost effective way.

2.2.5.3.2 Existing Local Regulations

Procedures to ensure long-term operation and maintenance of stormwater management practices remaining in place after construction are included in the Town's existing Stormwater Regulations promulgated to support administration of the Town's Stormwater Management By-Law (Article XXI of the General By-Laws), included herein as Appendix G. These are part of the Operation and Maintenance Plan required as part of the Stormwater Management Permit application submittal. With the exception of language stipulating submittal of as-built drawings, no further recommendations are proposed to meet this obligation, as the Town's current regulations are adequate.

Open Space Plans, and zoning regulations can promote improved water quality by guiding the growth of a community away from sensitive areas and by restricting certain types of growth to areas that can support it without compromising water quality. In 2013, the Neponset River Watershed Association undertook an analysis of the Town's existing zoning by-laws and review standards to determine if they are consistent with sound stormwater management practices, as defined by the Metropolitan Area Planning Commission. Their findings are summarized below in Table 2-1.

Table 2-1: Consistency Assessment of Canton Bylaws / Standards for New Development for with Best Stormwater Management (NepRWA, 2013)*	
Bylaw or Regulation	**CANTON Consistent?**
ZONING BYLAW & SITE PLAN REVIEW STDS for new development	
Dimensional Requirements	
Limits on tree clearance, at least for large trees and forest stands	**No, but may revise**
Parking Requirements	
Allow permeable paving for parking stalls on land held in common	**No, by special permit**
Don't require > 3 off-street pking spaces per 1000 sq .ft. of floor in prof. bldgs	**No (4 allowed)**
Allow reduction of parking requirements if shared parking	**No**
Allow reduced parking for homes/businesses near transit stops	**No**
Recommend or require smaller stalls for compact cars, up to 30%	**No**
Require vegetated islands with biorention areas in parking lots	**No**
SUBDIVISION RULES/REGS; ROADWAY DESIGN STANDARDS	
Street Location	
Street layout considerations should include reducing street lengths and	**No?**
minimizing pavement; reducing cut & fill; preventing streets on steep hillsides	
and instead routing them on ridge lines; and protecting natural features.	
Street Cross Sections	
Allow roads as small as 22 feet wide on low traffic residential streets	**No Fire Dept objects**
Don't require curbs everywhere but allowroadside swales	**?**
Allow permeable paving for shoulders/parking lanes in residential areas	**No**
Allow permeable paving on sidewalks	**No**
Permit sidewalks on 1 side of the street in low density residential areas	**No but may waive**
Design sidewalks so runoff disconnected from stormwater system	**No**
Site Work	
Rqe reestablishment of soil permeability compacted by construction work	**No**
Dead Ends	
Minimize radii for cul-de-sacs (35 ft optimal if adequate for emergencies)	**No Fire Dept objects**
Permit one-way loop streets to eliminate turnarounds	**No, though waivers**
Permit "hammerhead" turnarounds instead of cul-de-sacs	**No Fire Dept objects**

*Consistency review conducted by Neponset River Watershed Assoc, 2013, in relation to guidance provided by Metropolitan Area Planning Commission.

Since that time, no further guidance from regulators has been provided, and the recommendations above stand as proposed. Based on Draft permit terms, the Town is not necessarily required to implement any of the recommendations regarding modification of existing regulation or subdivision rules and regulations. Within three (3) years from the effective

date of the permit, the Town must develop a report assessing existing local regulations as has been completed and cited here. The review is intended to address zoning and construction codes to determine the feasibility of making green infrastructure practices allowable when appropriate site conditions exist. The existing analysis meets the minimum requirements of that analysis. Ideally, the recommended practices would be integrated into the Town's design standards within a reasonably short period of time, although no implementation schedule is included in the permit. EPA has developed some guidance regarding overcoming barriers to implementing low impact development (LID) and green infrastructure techniques in a community. The guidance can be found at http://www.epa.gov/region1/npdes/stormwater/assets/pdfs/AddressingBarrier2LID.pdf.

Future MS4 Annual Reports must include description of steps taken and progress achieved towards implementing the proposed changes. In the case of Canton, some of these design standards, such as reduction in street widths and cul de sac radii, intended to minimize impervious surfaces, are opposed by certain agencies in the community (such as the Fire Department) for perceived public safety reasons. Further engagement to discuss potential compromises will be required.

Within two (2) years of the effective date of the final MS4 permit, Canton must develop a report assessing current street design and parking lot guidelines and other local requirements that affect the creation of impervious cover. The assessment above performed by NepRWA partially covered requirements for content of this assessment. As it currently stands, the Town's standards typically do not allow reduction of impervious surface created through parking requirements for new commercial development. The NepRWA assessment recommended changes be made, with reference to potential model standards from surrounding communities such as Dedham and Westwood, where modifications have already been incorporated allowing reduced impervious surface. The assessment must include recommendations and proposed schedules to incorporate policies and standards into relevant documents and procedures to minimize impervious cover attributable to parking areas and street designs. Canton will have to report in each annual report on the status of this assessment including any planned or completed changes to local regulations and guidelines.

Compliance Status: The Town is currently in compliance with the existing 2003 Permit, and well along in terms of required components for assessment of opportunities for introduction of green infrastructure and LID techniques in future development. Once the Final Permit is issued Canton will need to incorporate these changes into its rules and regulations.

2.2.5.3.3 Directly Connected Impervious Area

The Draft general permit requires permittees to estimate the annual increase or decrease in the number of acres of impervious area (IA) and directly connected impervious area (DCIA) draining to its MS4 and report those estimates in each annual report. The Town is supposed to tabulate its estimates by sub-basins. Kleinfelder undertook to establish whether the existing baseline of impervious cover, or directly connected impervious cover, provided on EPA's website is an accurate representation of conditions in Canton. The Kleinfelder analysis did establish some discrepancies, the full details of which are provided in a November 8, 2012 memorandum to the Town. The DCIA memo has been provided in Appendix H. The procedure for tracking the annual decrease or increase in IA and DCIA will utilize GIS and will depend on the Town adopting electronic as-built submittal requirements in a proper format. This will greatly reduce

the effort required to determine the changes. The electronic standards could also require plan submittals to include calculations of IA and DCIA. A tracking sheet has been included in the Compliance Tracking Log in Appendix D.

Compliance Status: The Town has a good baseline calculation of existing DCIA. In the future, annual reports will have to estimate the total area of increase or decrease in DCIA for that reporting term. Information to inform that calculation will be derived from site plans and subdivisions submitted to the Planning Board for which as-built drawings will be required.

2.2.5.3.4 Municipal Property Inventory for Suitable BMP Retrofit Locations

Based on the current Draft general permit, two (2) years from the permit effective date Canton must complete an inventory and priority ranking of Town-owned property and existing infrastructure that could be retrofitted with BMPs designed to reduce the frequency, volume and pollutant loads of stormwater discharges to its MS4 through the mitigation of impervious area. Properties and infrastructure for consideration are to include those with the potential for mitigation of on-site impervious area and DCIA, as well as those that could provide mitigation of off-site IA and DCIA. At a minimum, permittees are supposed to consider municipal property with significant impervious cover (including parking lots, buildings, and maintenance yards) that could be mitigated and open space and undeveloped land available to mitigate impervious cover and associated stormwater from proximate offsite properties. MS4 infrastructure to be considered includes existing street right-of-ways, outfalls and conventional stormwater conveyances and controls (including swales and detention practices) that could be readily modified to provide reduction in frequency, volume or pollutant loads of such discharges through the mitigation of impervious cover.

In 2012, the NepRWA undertook an inventory and analysis of stormwater BMP retrofit opportunities within the Town of Canton and detailed findings in a June 2012 report entitled *Stormwater BMP Retrofit Development Canton, MA* which identifies municipally owned property and existing infrastructure that can be retrofitted with BMPs to reduce frequency, volume and pollutant loads of stormwater discharges. The project approach allowed the Town to look broadly across the community for suitable opportunities, and eventually prioritize both the types of BMPs and the locations with specificity. This effort included conceptual design of BMPs and fully meets the Town's obligations under this permit requirement.

Compliance Status: The Town's 2012 inventory, screening and prioritization of potential BMP retrofit locations meets the requirements of this permit term.

2.2.6 Minimum Control Measure 6: Pollution Prevention/Good Housekeeping

2.2.6.1 Rationale

Pollution Prevention/Good Housekeeping for municipal operations minimum control measures will likely improve or protect receiving water quality through alteration of municipal operations. This measure can generate cost savings for the Town over the long term, since appropriate maintenance of storm sewer systems can avoid damage caused by age and neglect.

Compliance with this Minimum Control Measure results in reductions in pollution that falls on streets, parking lots, open spaces, and storage and vehicle maintenance areas and is carried by stormwater into local waterways, and improvement of management approaches to avoid

environmentally destructive development and stormwater management practices or poor maintenance of storm sewer systems.

2.2.6.2 General Approach

Responsible Agency/Person: Department of Public Works/Superintendent Michael Trotta

Goals for the MCM: Canton will execute on the written Canton Facility BMPs Manual for stormwater management plan.

In general, the purpose behind this Minimum Measure is to improve existing municipal operations to the point that they minimize pollution of stormwater discharges into local waters. The following components were considered when developing the pollution prevention/good housekeeping program for the Town of Canton:

1. **Maintenance activities, maintenance schedules, and long-term inspection procedures** for structural and non-structural controls to capture floatables and other pollutants and prevent discharge into local waters from the storm sewers;
2. **Identification and implementation of controls for eliminating discharge of pollutants** from Town-controlled areas including roads, parking lots, maintenance and storage yards, and waste transfer stations; and
3. **Procedures for the proper disposal of waste** including dredge spoil, accumulated sediments, floatables, and other debris removed from catch basins and other accumulators as well as areas listed above.

To implement the pollution prevention/good housekeeping program, the Town was required to:

- Develop a training program for municipal employees on how to incorporate pollution prevention/good housekeeping techniques into municipal operations such as park and open space maintenance, fleet and building maintenance, new construction and land disturbances, and stormwater system maintenance;
- Develop and implement an Operations and Maintenance Plan with the ultimate goal of preventing polluted runoff from entering the storm sewer system;
- Determine appropriate Measurable Goals and Best Management Practices (BMPs) for the pollution prevention/good housekeeping program.

2.2.6.3 Current Programs Status

The Town has developed a Facilities Best Management Practices Manual and Operations and Maintenance Plan which has been provided as Appendix I. The written plan can be used to support budget needs instead of reflecting budget constraints. The Town has also generated an inventory of municipally-owned facilities for which these BMP's are appropriate.

3. STORMWATER POLLUTION PREVENTION PLANS

As required by the MS4 Permit, the Town has developed a single stormwater pollution prevention plan (SWPPPs) covering the two relevant municipal facilities; the DPW garage and the Town Recycling Facility.

The SWPPPs are maintained on the respective property sites for reference, and included with this Stormwater Master Plan as Appendix J.