

Baseline Trash Load and Short-Term Trash Load Reduction Plan

Submitted by:



**Town of Hillsborough
1600 Floribunda Avenue
Hillsborough, CA 94010**

In compliance with Provisions C.10.a(i) and C.10.a(ii) of Order R2-2009-0074

January 26, 2012

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**TOWN OF HILLSBOROUGH
SHORT-TERM TRASH LOAD REDUCTION PLAN**

CERTIFICATION STATEMENT

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

Signature by Duly Authorized Representative:

A handwritten signature in cursive script, appearing to read "Dave Bishop", is written over a solid horizontal line.

Dave Bishop
Assistant City Engineer

January 26, 2012

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ABBREVIATIONS

BASMAA	Bay Area Stormwater Management Agencies Association
BID	Business Improvement District
CalRecycle	California Department of Resources Recycling and Recovery
Caltrans	California Department of Transportation
CASQA	California Stormwater Quality Association
CDS	Continuous Deflection Separator
CEQA	California Environmental Quality Act
EIR	Environmental Impact Report
EPA	Environmental Protection Agency
GIS	Geographic Information System
MRP	Municipal Regional Stormwater NPDES Permit
MS4	Municipal Separate Storm Sewer System
NGO	Non-Governmental Organization
NPDES	National Pollutant Discharge Elimination System
Q	Flow
SFRWQCB	San Francisco Regional Water Quality Control Board
SWRCB	State Water Resource Control Board
TMDL	Total Maximum Daily Load
USEPA	United States Environmental Protection Agency
Water Board	San Francisco Regional Water Quality Control Board
WDR	Waste Discharge Requirements

PREFACE

This Baseline Trash Load and Short-Term Trash Load Reduction Plan (Plan) is submitted in compliance with provision C.10.a(i) and C.10.a(ii) of the Municipal Regional Stormwater NPDES Permit (MRP) for Phase I communities in the San Francisco Bay (Order R2-2009-0074). This Plan was developed using a regionally consistent format developed by the Bay Area Stormwater Management Agencies Association (BASMAA). Based on new information that becomes available during the implementation of this Short-Term Plan (e.g., revisions to baseline loading estimates or load reduction credits of quantification formulas), the Town of Hillsborough (Town) may choose to amend or revise this Plan. If revisions or amendments are necessary, a revised Short-Term Plan will be submitted to the Water Board via the Town of Hillsborough's annual reporting process.

Please Note: This Baseline Trash Load and Short-Term Trash Load Reduction Plan template and guidance was prepared to assist cities and counties (i.e., Permittees) subject to requirements in provision C.10.a.i of the Municipal Regional Stormwater NPDES Permit (MRP) for Phase I communities in the San Francisco Bay (Order R2-2009-0074). The template and guidance are intended to provide Permittee's with a format for developing their Short-Term Plans and submitting to the San Francisco Bay Regional Water Quality Control Board by February 1, 2012 in compliance with MRP provision C.10.a.i. The template provides a mechanism to link the results of the *Trash Baseline Generation Rates Project* and the *Trash Load Reduction Tracking Method*, each coordinated by Bay Area Stormwater Management Agencies Association (BASMAA). The use of this document and associated guidance are done so under the discretion of each Permittee.

INTRODUCTION

The Municipal Regional Stormwater NPDES Permit for Phase I communities in the San Francisco Bay (Order R2-2009-0074), also known as the Municipal Regional Permit (MRP), became effective on December 1, 2009. The MRP applies to 76 large, medium and small municipalities (cities, towns and counties) and flood control agencies in the San Francisco Bay Region, collectively referred to as Permittees. Provision C.10 of the MRP (Trash Load Reduction) requires Permittees to reduce trash from their Municipal Separate Storm Sewer Systems (MS4s) by 40 percent before July 1, 2014.

Required submittals to the San Francisco Bay Regional Water Quality Control Board (Water Board) by February 1, 2012 under MRP provision C.10.a (Short-Term Trash Loading Reduction Plan) include:

1. (a) Baseline trash load estimate, and (b) description of the methodology used to determine the load level.
2. A description of the Trash Load Reduction Tracking Method that will be used to account for trash load reduction actions and to demonstrate progress and attainment of trash load reduction levels.
3. A **Short-Term Trash Loading Reduction Plan** that describes control measures and best management practices that will be implemented to attain a 40 percent trash load reduction from its MS4 by July 1, 2014;

This Short-Term Trash Load Reduction Plan (Short-Term Plan) is submitted by the Town of Hillsborough in compliance with the portions of MRP provision C.10.a.i listed as 1a and 3 above. In compliance with 1b, BASMAA submitted a progress report on behalf of Permittees that briefly describes the methodologies used to develop trash baseline loads (BASMAA 2011a). These methods are more fully described in BASMAA (2011b, 2011c). Lastly, the *Trash Load Reduction Tracking Method Technical Report* (BASMAA 2011d) was submitted by BASMAA on behalf of Permittees in compliance with submittal 2 described above. The Baseline Loading Rates and Tracking Method projects are briefly described below.

Baseline Trash Generation Rates Project

Through approval of a BASMAA regional project, Permittees agreed to work collaboratively to develop a regionally consistent method to establish baseline trash loads from their MS4s. The project, also known as the *BASMAA Baseline Trash Generation Rates Project* assists Permittees in establishing a baseline to demonstrate progress towards MRP trash load reduction goals (i.e., 40%). The intent of the project was to provide a scientifically-sound method for developing (default) baseline trash generation rates that can be adjusted, based on Permittee/site specific conditions; and used to develop baseline loading rates and loads. Baseline loads form the reference point for comparing trash load reductions achieved through control measure implementation.

Baseline trash loading rates are quantified on a volume per unit area basis and based on factors that significantly affect trash generation (e.g., land use, population density, and economic profile). The method used to establish baseline trash loads for each Permittee builds off “lessons learned” from previous trash loading studies conducted in urban areas (Allison and Chiew 1995; Allison et al. 1998; Armitage et al. 1998; Armitage and Rooseboom 2000; Lippner et al. 2001; Armitage 2003; Kim et al. 2004; County of Los Angeles 2002, 2004a, 2004b; Armitage 2007). The method is based off a conceptual model developed as an outgrowth of these studies (BASMAA 2011b). Baseline trash loading rates were

developed through the quantification and characterization of trash captured in Water Board recognized full-capture treatment devices installed in the San Francisco Bay area. Methods used to develop trash baseline loading rates are more fully described in BASMAA (2011b, 2011c, and 2012).

Trash Load Reduction Tracking Method Summary

The trash load reduction tracking method, described in the *Trash Load Reduction Tracking Method Technical Report*, assists Permittees in demonstrating progress towards reaching trash load reduction goals defined in the MRP (e.g., 40%). The tracking method is based on information gained through an extensive literature review and Permittee experiences in implementing stormwater control measures in the San Francisco Bay Area. The literature review was conducted to evaluate quantification methods used by other agencies to assess control measure effectiveness or progress towards quantitative goals. Results are documented in the *Trash Load Reduction Tracking Method: Technical Memorandum # 1 – Literature Review* (BASMAA 2011d).

Methods attributable to specific trash control measures fall into two categories: 1) trash load reduction quantification formulas; and 2) load reduction credits (BASMAA 2011e). Quantification formulas were developed for those trash control measures that were deemed feasible and practical to quantify load reductions at this time. Load reduction credits were developed for all other control measures included in the methodology development. Both categories of methods assume that as new or enhanced trash control measures are implemented by Permittees, a commensurate trash load reduction will occur. Progress towards load reduction goals will be demonstrated through comparisons to established trash baseline load estimates developed through the BASMAA *Baseline Generation Rates Project*.

Short-Term Trash Load Reduction Plan

The purpose of this Short-Term Plan is to describe the current level of implementation of control measures and best management practices, and identify the type and extent to which new or enhanced control measures and best management practices will be implemented to attain a 40 percent trash load reduction from their MS4 by July 1, 2014. The Short-Term Plan was developed using a template created by BASMAA through a regional project. New and enhanced trash control measures (i.e., Best Management Practices) that Permittees may implement to demonstrate trash load reduction goals are included in Table 1.1. This list was developed collaboratively through the BASMAA Trash Committee, which included participation from Permittee, stormwater program, Water Board and non-governmental organization (NGO) staff. The list of control measures is based on: 1) the potential for Permittees to implement; 2) the availability of information required to populate formulas and develop credits; and 3) the expected benefit of implementation. Load reductions associated with each control measure are demonstrated either through a quantification formula (QF) or credits (CR) described in the *Trash Load Reduction Tracking Method Technical Report* (BASMAA 2011e).

In efforts to reduce trash discharged from MS4s, Permittees may choose to implement control measures that are not included in Table 1.1 or described more fully in BASMAA (2011e). If a Permittee chooses to do so, methods specific to calculating trash load reductions for that control measure would need to be developed. Additionally, at that point, consideration should be given to updating this Short-Term Plan.

Additionally, based on new information that becomes available during the implementation of this Short-Term Plan (e.g., revisions to baseline loading estimates or load reduction credits of quantification formulas); the Town of Hillsborough (Town) may amend or revise this Plan. If revisions or amendments

are necessary, a revised Short-Term Plan will be submitted to the Water Board via the Town’s annual reporting process.

Table 1.1: Trash control measure for which load reduction quantification credits or formulas were developed to track progress towards trash load reduction goals.

Load Reduction Credits
Public Education and Outreach Programs
Activities to Reduce Trash from Uncovered Loads
Anti-Littering and Illegal Dumping Enforcement Activities
Improved Trash Bin/Container Management Activities
Quantification Formulas
On-land Trash Pickup (Volunteer and/or Municipal)
Enhanced Storm Drain Inlet Maintenance
Creek/Channel/Shoreline Cleanups (Volunteer and/or Municipal)

This Short-Term Plan is organized into the following sections:

- Introduction;
- Trash Baseline Load Estimate;
- Load Reduction Calculation Process;
- Planned Implementation of New or Enhanced Control Measures;
- Implementation Schedule; and
- References

2.0 BASELINE TRASH LOADING ESTIMATE

***Note:** In this section, a set of default trash generation rates and estimated trash baseline loads are presented. Generation rates were developed via a BASMAA regional collaborative project and should be considered preliminary. Although to-date BASMAA has attempted to develop rates that are applicable to all municipalities in the San Francisco Bay Area, preliminary rates and baseline loads presented within this section are not believed to be fully representative of trash discharged from the Town of Hillsborough's (Town) municipal separate storm sewer system (MS4). It is our understanding that BASMAA will continue to refine trash generation rates during the completion of its Trash Baseline Generation Rates Project in 2012 and attempt to develop refined generation rates that may be more applicable to the Town. If the Town deems that these refined generation rates are applicable, these refined rates will be used to revise trash baseline loads presented in this section. If BASMAA is unable to develop refined generation rates that are applicable to the Town, then the Town may individually or in collaboration with other similar cities and towns, develop city-specific generation rates and revise baseline load estimates presented in this section accordingly.*

This section provides the estimated annual trash baseline load from the Town of Hillsborough's Municipal Separate Storm Sewer System (MS4). In compliance with Provision C.10.a.ii of the MRP, the Town worked collaboratively with other MRP Permittees through BASMAA to develop data and the process necessary to establish baseline trash loading estimate from our MS4. The collaborative project was managed through the BASMAA Trash Committee and included a series of steps described in BASMAA (2012) and listed below. The approach was intended to be cost-effective and consistent, but still provide an adequate level of confidence in trash loads from MS4s, while acknowledging that uncertainty in trash loads still exists. The approach entailed the following steps:

- Step #1. Conduct literature review;
- Step #2. Develop conceptual model;
- Step #3. Develop and implement sampling and analysis plan;
- Step #4. Test conceptual model;
- Step #5. Develop and apply default trash **generation rates** to Permittee effective loading areas;
- Step #6. Adjust default trash generation rates based on baseline levels of control measure implementation by the Permittee to develop trash **baseline loading rates**; and,
- Step #7. Calculate Permittee-specific annual trash **baseline load**.

Through the collaborative BASMAA project, default baseline trash generation rates (volume per area) were developed for a finite set of categories, based on factors that significantly affect trash loads (e.g., land use). These trash generation rates were then applied to effective loading areas in applicable jurisdictional areas within the Town of Hillsborough. Trash generation rates were then adjusted based on baseline street sweeping, storm drain inlet maintenance, and stormwater pump station maintenance conducted in each applicable area. The sum of the trash loads (i.e., rate multiplied by area) from each effective loading area represents the Town of Hillsborough's baseline trash load from its MS4. A full description of the methods by which trash baseline loads were developed is included in BASMAA (2012a) and is summarized below.

This section provides a summary of land use characteristics and demographics in the Town that, based on the results of the BASMAA *Trash Generation Rates Project*, appear to affect trash generation rates.

The process by which the Town’s trash baseline loading estimate was developed is also more fully described below.

Default Trash Generation Rates (Regional Approach)

A set of default trash generation rates was developed via the BASMAA regional collaborative project (BASMAA 2012a). Default generation rates were developed based on a comparison between trash characterization monitoring results, land uses, economic profiles, and other factors that were believed to possibly affect trash generation. Three trash characterization monitoring events were scheduled via the *Trash Generation Rates Project*. Due to the compliance timeline in the MRP, only two of three trash characterization monitoring events were used to develop trash generation rates described in BASMAA (2012a) and presented in this section. Following the completion of the third characterization event (Winter 2011/12), this section of the Short-Term Plan may be updated to reflect the most up-to-date trash generation and loading rates available. Trash generation rates based on the results of two of the three characterization events are shown in Table 2-1 for each trash loading category.

Table 2.1 - Regional Default Annual Trash Generation Rates by Land Use Category.

Land Use Category	Generation Rates (Gallons/Acre)
Retail and Wholesale	29.99
High Density Residential	17.04
K-12 Schools	13.14
Commercial and Services/ Heavy, Light and Other Industrial	7.08
Urban Parks	2.14
Low Density Residential	1.25
Rural Residential	0.17

Jurisdictional and Effective Loading Areas

Default trash baseline generation rates presented in Table 2-1 were applied to effective loading areas with **jurisdictional areas** within the Town of Hillsborough. The Town’s jurisdictional areas include all urban land areas within the Town boundaries that are subject to the requirements in the MRP. Land use areas identified by a combination of the ABAG 2005 land use dataset and Permittee knowledge that were not included within the Town’s jurisdictional areas include:

- Federal and State of California Facilities and Roads (e.g., Interstates, State Highways, Military Bases, Prisons);
- Roads Owned and Maintained by Santa Mateo County;
- Non-urban Land Uses (e.g., agriculture, forest, rangeland, open space, wetlands, water);
- Communication or Power Facilities (e.g., PG & E Substations);

Town of Hillsborough

Once the Town's jurisdictional area was delineated, an effective trash loading area was developed by creating a 200-foot buffer around all streets within the Town's jurisdictional area. The purpose of the effective loading area is to eliminate land areas not directly contributing trash to the Town's MS4 (e.g., large backyards and rooftops). Both the jurisdictional and the effective loading areas for the Town are presented in Table 2-2.

Table 2.2 - Jurisdictional areas and effective loading areas in the Town of Hillsborough by land use classes identified by ABAG (2005).

Land Use Category	Jurisdictional Area (Acres)	Effective Loading Area (Acres)	% of Effective Loading Area
High Density Residential	0	0	0
Low Density Residential	2,321	2,178	76
Rural Residential	1,021	633	22
Commercial and Services/ Heavy, Light and Other Industrial	6	5	0
Retail and Wholesale	0	0	0
K-12 Schools	83	31	1
Urban Parks	2	2	0
TOTAL	3,432	2,849	100%

Permittee-Specific Baseline Trash Loading Rates

Regional default trash generation rates developed through the BASMAA regional collaborative project were applied to effective loading areas within the Town of Hillsborough based on identified land uses. These generation rates were then adjusted based on the calculated effectiveness of baseline street sweeping, storm drain inlet maintenance and pump station maintenance implemented by the Town. These adjustments were conducted in GIS due to the site specificity of baseline generation rates and baseline control measure implementation. The following sections describe the baseline level of implementation for these three control measures. A summary of trash baseline generation and loading rates for the Town are provided in Table 2-3 and areas associated with these rates are illustrated in Figure 2-1.

Baseline Street Sweeping

A "baseline" street sweeping program is defined as the sweeping frequency and parking enforcement implemented by the Town of Hillsborough prior to effective date of the MRP. Baseline street sweeping differs from "enhanced" street sweeping, which includes increased parking enforcement and/or sweeping conducted at a frequency greater than baseline ceiling (i.e., once per week for retail land uses and twice per month for all other land uses). The baseline ceiling was created to not penalize implementers of enhanced street sweeping programs prior to the effective date of the MRP. For those Permittees that sweep less frequent than the baseline ceiling, their current sweeping frequency serves as their baseline.

The Town of Hillsborough currently does not have a street sweeping program and does not sweep any of its streets. As part of the Town’s current Municipa Code, it is the private owner’s responsibility to properly maintain any debris, litter and/or vegetation within property limits and in the public right-of-way.

Baseline Storm Drain Inlet Maintenance

Within the Town, storm drain inlets were cleaned at a baseline level of one time per year prior to the effective date of the MRP. Based on this baseline frequency and the effectiveness rating developed in BASMAA (2012b), the baseline storm drain maintenance program in the Town of Hillsborough has an annual effectiveness rating of 5%. The estimated trash load reduced via baseline storm drain inlet maintenance is presented in Table 2-3.

Baseline Stormwater Pump Station Maintenance

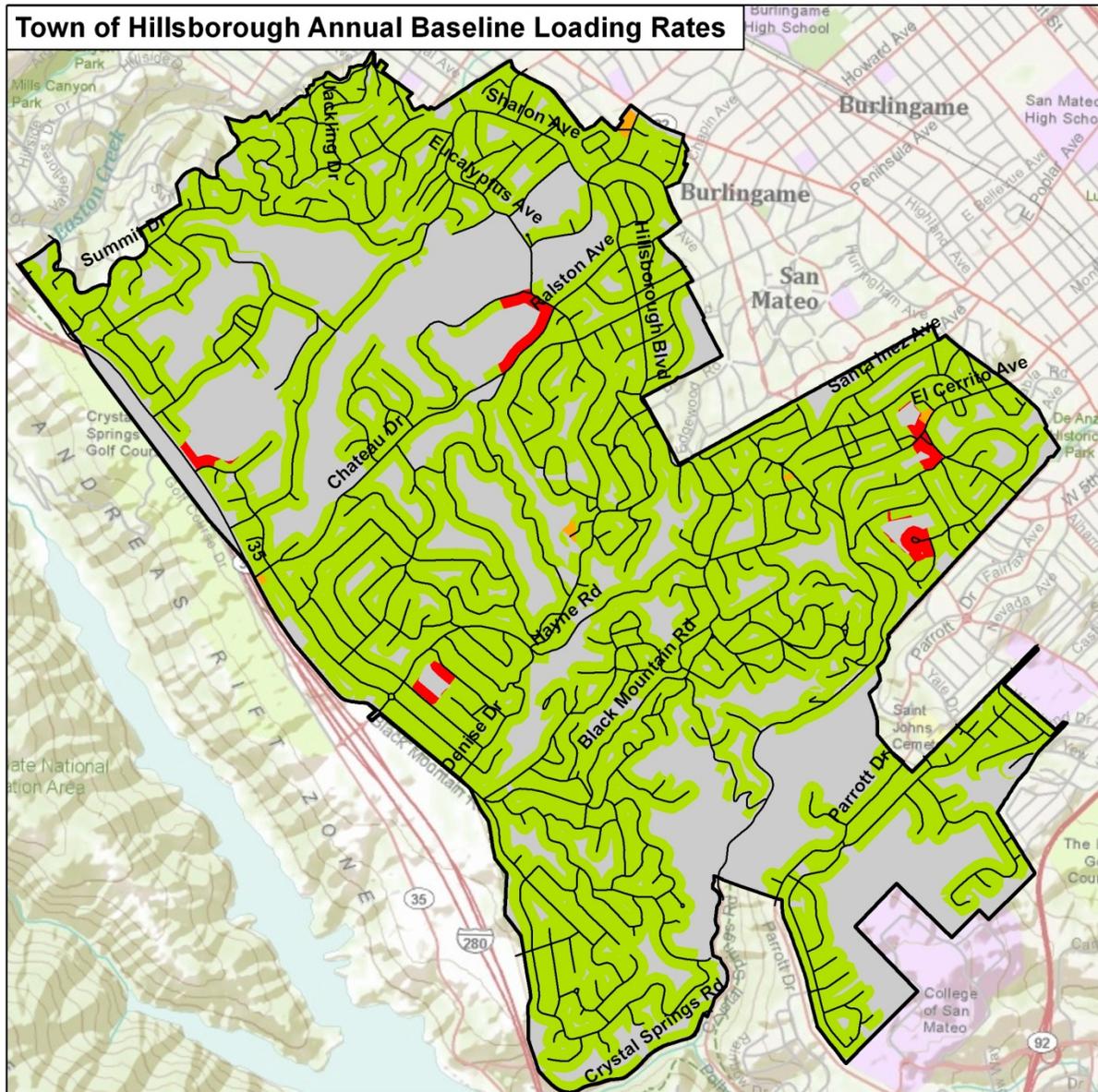
The Town of Hillsborough does not own stormwater pump stations with trash racks that capture trash and allow for removal during maintenance. However, the City of San Mateo owns one pump station with trash racks which drains a portion of Hillsborough. For this pump station, the estimated volume of trash removed annually prior to the effective date of the MRP is considered the baseline level of implementation. To determine the baseline volume of trash removed from pump stations, an effectiveness rating of 25% removal of the baseline trash load attributable to the area draining to the pump station is assumed. This effectiveness rating is based on methods developed in BASMAA (2012b). The estimated trash load reduced via baseline pump station maintenance is presented in Table 2-3.

Baseline Trash Loading Estimate

The estimated baseline trash load from the Town of Hillsborough was calculated as the sum of the loads from the Town’s effective loading area, adjusted for baseline implementation of street sweeping, storm drain inlet maintenance, and pump station maintenance. The preliminary annual trash baseline load for the Town of Hillsborough is presented in Table 2-3. Preliminary baseline trash loading rates are presented in Figure 2-1 to provide a geographical illustration of areas with estimated low, moderate, high and very high trash loading rates.

Table 2.3 - Preliminary annual trash baseline load for the Town of Hillsborough.

Category	Annual Load (gallons)
Preliminary Generation Trash Load	3,283
Load Removed via Baseline Street Sweeping	0
Load Removed via Baseline Storm Drain Inlet Maintenance	164
Load Removed via Baseline Stormwater Pump Station Maintenance	2
Preliminary Trash Baseline Load	3,117



Annual Baseline Loading Rate (gal/acre)

- Outside: 1) Jurisdictional Area or
2) Effective Loading Area
- Low (> 0 to 5)
- Mod (> 5 to 10)
- High (> 10)
- Permittee Streets
- Permittee Boundary

0 0.4 0.8 Miles



Data Sources:

Streets: Tele Atlas, 2003, Retrieved from <http://www.arcgis.com/>
City Boundary: County of San Mateo
Background: ESRI World Topographic Map

Map Created By: EOA, Inc.
Date: December 12, 2011

Figure 2-1: Estimated trash baseline loading rates for geographical areas in the Town of Hillsborough.

3.0 LOAD REDUCTION CALCULATION PROCESS

Using the guiding principles and assumptions described BASMAA (2011e), a stepwise process for calculating trash load reductions was developed collaboratively through BASMAA. This process is fully described in Trash Load Reduction Tracking Method Technical Report (BASMAA 2011e) and is briefly summarized in this section. The process takes into at what point in the trash generation and transport process a trash control measure: 1) prevents trash generation, 2) intercepts trash in the environment prior to reaching a water body, or 3) removes trash that has reached a water body. In doing so, it avoids double-counting of trash load reductions associated with specific control measures.

To demonstrate trash load reductions, baseline trash loading rates will be adjusted using the following process:

- Step #1. Existing Enhanced Street Sweeping;
- Step #2. Trash Generation Reduction ;

- Step #3. On-land Interception;
- Step #4. Trash Interception in the Stormwater Conveyance System;

- Step #5. Trash Interception in Waterways; and
- Step #6. Comparison to Baseline Trash Load

Reductions calculated in Steps 2 and 5 are assumed to be implemented at a constant rate on an “area-wide” basis. For example, if a new region-wide public education strategy is implemented within the San Francisco Bay area, all Permittees can apply load reduction credits associated with this control measure. In contrast, Steps 1, 3 and 4 are “area-specific” reductions that only apply to specific areas within a Permittee’s jurisdiction. Area-specific control measures include full-capture treatment devices and enhanced street sweeping. Area-specific reductions may require the use of a Geographic Information System (GIS) to calculate.

Reductions are generally applied in the sequence as presented in Figure 2-1 and described below, although some reductions may be applied “in-parallel” and calculated during the same sub-step in the process.

Step #1: Existing Enhanced Street Sweeping

Trash load reductions due to existing enhanced street sweeping implemented prior to the effective date of the MRP and conducted at levels above baseline levels are not incorporated into each Permittee’s trash baseline load. Therefore, load reductions associated with existing enhanced are accounted for first in the trash load reduction calculation process. Existing enhanced street sweeping includes street sweeping conducted at a frequency greater than **1x/week** for streets within retail land use areas or greater than **2x/month** for streets in all other land use areas. The result of adjustments made to trash baseline loads due to the implementation of existing enhanced street sweeping is a set of **current baseline loading rates** and a **current baseline load**.

Step #2: Trash Generation Reduction Control Measures

Trash generation reduction control measures prevent or greatly reduce the likelihood of trash from being deposited onto the urban landscape. They include the following area-wide control measures:

- CR-1: Public Education and Outreach Programs
- CR-2: Reduction of Trash from Uncovered Loads
- CR-3: Anti-Littering and Illegal Dumping Enforcement
- CR-4: Improved Trash Bin/Container Management

Load reductions associated with trash generation reduction control measures are applied on an area-wide basis.² Therefore, reductions in current baseline loading rates are adjusted uniformly based on the implementation of the control measure and the associated credit claimed.

Baseline loading rate adjustments for all generation reduction controls measures implemented may be applied in-parallel, but should be applied prior to calculating on-land interception measures discussed in Step #3. The result of adjustments to trash baseline loading rates due to the implementation of these enhanced control measures will be a set of **street loading rates**. The **street load** is the volume of trash estimated to enter the environment and available for transport to the MS4 if not intercepted via on-land control measures described in Step #2.

Step #3: On-land Interception Control Measures

Once trash enters the environment, it may be intercepted and removed through the following control measures prior to reaching the stormwater conveyance system:

- QF-1: On-land Trash Cleanups (Volunteer and/or Municipal) (Area-wide)

Since on-land trash cleanups can affect the amount of trash available to street sweepers, load reductions associated with their implementation will be quantified first, followed by street sweeping enhancements. On-land trash cleanups will be applied as an area-wide reduction and all effective loading rates will be adjusted equally. Enhanced street sweeping, however, is an area-specific control measure and only those effective loading rates associated with areas receiving enhancements will be adjusted. Due to the spatial nature of enhanced street sweeping, GIS may be needed to conduct this step.

The result of adjustments to effective loading rates due to the implementation of these enhanced control measures will be a set of **conveyance system loading rates**. The **conveyance load** is the volume of trash estimated to enter the stormwater conveyance system (e.g., storm drains).

² The only exception to this statement are load reductions associated with the establishment of Business Improvement Districts (BIDs) or equivalent, which are specific to geographic areas and considered "area-specific".

Step #4: Control Measures that Intercept Trash in the MS4

Control measures that intercept trash in the stormwater conveyance system are area-specific. Therefore, they only apply to land areas and associated trash loads reduced. Conveyance system loading rates developed as a result of Step #3 should be adjusted in-parallel for the following control measures:

QF-2: Enhanced Storm Drain Inlet Maintenance (Area-specific)

Load reductions for these control measures are calculated in-parallel because they are applied to independent geographical areas. Reductions from all control measures described in this step are area-specific and may require the use of GIS to calculate a set of **waterway loading rates**. Once waterway loading rates have been determined, a **waterway load** will be developed and used as a starting point for calculating load reductions associated with trash interception in waterways discussed in Step #5.

Step #5: Control Measures that Intercept Trash in Waterways

The load of trash that passes through the stormwater conveyance system without being intercepted may still be removed through interception in waterways. There are two control measures associated with interception in waterways:

QF-3: Creek/Channel/Shoreline Cleanups (Volunteer and/or Municipal) (Area-wide)

As these control measures are implemented, load reduction estimates can be calculated in-parallel for these two measures.

Step #6: Comparison to Baseline Trash Load

Applying the four steps described in the processes above will provide an estimated trash load (volume) remaining after trash control measures are implemented. As depicted in the following equation, the relative percent difference between the baseline load and the load remaining after control measures are implemented is the percent reduction that will be used to assess progress towards MRP trash load reduction goals.

$$\frac{\text{Baseline Load} - \text{Remaining Load}}{\text{Baseline Load}} = \% \text{ Reduction}$$

4.0 ENHANCED TRASH CONTROL MEASURES

This section describes the new or enhanced trash control measures planned for implementation by the Town of Hillsborough. The enhanced control measures described are designed to reach a 40% reduction by July 1, 2014. New and enhanced control measures that will be implemented by Town include those listed in Table 4.1.

The Town does not have a trash issue and is zoned single-family residential and does not have business, industrial and commercial developments. As part of the load reduction calculation process discussed in Section 3.0 and based on the Town’s characteristics, the following control measure will not apply:

- Single-Use Carryout Plastic Bag Ordinances
- Polysterene Foam Food Service Ware Ordinances
- Single-Use Food and Beverage Ware Ordinances
- Enhanced Street Sweeping (Area-specific)
- Partial-Capture Treatment Device (Area-specific)
- Full Capture Treatment Devices (Area-specific)

The Town does have limited public and private schools, parks, fire stations and a corporation yard that are institutional and government facilities. As part of the plan, the Town will improve existing actions and implementation levels to reduce trash and contribute to the local and regional programs. At the moment the Town determined to not move forward with any capital improvement for trash reduction.

Table 4.1 - Trash control measures that will be implemented by Town of Hillsborough to reach the 40% trash load reduction.

Control Measures
CR-1: Public Education and Outreach Programs
CR-2: Activities to Reduce Trash from Uncovered Loads
CR-3: Anti-Littering and Illegal Dumping Enforcement Activities
CR-4: Improved Trash Bin/Container Management (Municipally or Privately-Controlled)
QF-1: On-land Trash Pickup (Volunteer and/or Municipal)
QF-2: Enhanced Storm Drain Inlet Maintenance
QF-3: Creek/Channel/Shoreline Cleanups (Volunteer and/or Municipal)

CR-1: Public Education and Outreach Programs

Permittees in the San Francisco Bay Area have implemented public education and outreach programs to inform residents about stormwater issues relating to pollutants of concern, watershed awareness and pollution prevention. Public education and outreach efforts include developing and distributing brochures and other print media; posting messages on websites and social networking media (Facebook, Twitter etc.), Town's quarter newsletter, attending community outreach events, and conducting media advertising. In recent years, some municipal agencies have implemented anti-litter campaigns to increase public awareness about the impacts of litter on their communities and water quality; and to encourage the public to stop littering.

Baseline Level of Implementation

The Town of Hillsborough participates in public education and outreach control measures through collaborative efforts with the countywide program, particularly with the community outreach events. These control measures are considered baseline because they were either not related to trash reduction specifically, or they are not planned to be continued during the term of the MRP.

Enhanced Level of Implementation

The Town of Hillsborough will implement the following as enhanced level of public education and outreach: 1) advertising campaigns, 2) outreach to school-age children or youth, and 3) media relations and continue to participate and improve the community outreach events.

The Town will participate in or contribute to advertising campaigns on trash/litter in waterways with the goal of to increase overall awareness of stormwater runoff pollution prevention messages and behavior changes in a target audience. The advertising campaigns will include the following attributes:

- *Specific anti-littering messages for reducing litter;*
- *A comprehensive advertising plan designed to reach the target audience; and*
- *Pre and post-campaign surveys which identify and quantify the audiences knowledge, trends and attitudes and/or practices; and measures the overall population's awareness of the messages and behavior changes achieved by the campaign.*

The Town will participate in or contribute to outreach programs (e.g., assemblies, presentations, etc.) designed to promote anti-littering behavior in school-age children (K through 12) at an implementation listed in Table CR-3.1 of the Trash Load Reduction Tracking Method Technical Report collaboratively with the countywide program.

The Town will participate in or contribute to media relations which use free media/media coverage focusing on litter issues (e.g., publicity of local creek/neighborhood cleanups). The Town will continue to advertise education information via the Town's newsletter, website, a neighborhood website called Hillsborough Together and Facebook page.

Percent Reduction from Enhancements

The Town of Hillsborough will receive a 8% reduction credit for implementing specific enhanced control measures described in *Enhanced Level of Implementation* section above. The 8%

reduction credit will be applied to the Town of Hillsborough's baseline trash load. This percent reduction credit is consistent with methods presented in the BASMAA (2011e). A summary of all load reductions anticipated through the implementation of this plan are included in Section 4.0.

CR-2: Reduction of Trash from Uncovered Loads

Although it is currently illegal to operate a vehicle that is improperly covered and which its' contents escapes³, vehicles remain an important trash source to MS4s and local waterways. Specifically, vehicles that do not secure or cover their loads when transporting trash and debris have a high risk of contributing trash to MS4s. Land areas that generate trash from vehicles include roads, highways (on/off ramps, shoulders or median strips) and parking lots. To help address the dispersion of trash from unsecured or uncovered vehicles destined for landfills and transfer stations, Permittees may require municipally-contracted trash haulers to cover or secure loads or work with municipal or private landfill and transfer station operators to educate waste haulers on securing loads and/or to enhance enforcement of existing regulations.

Baseline Level of Implementation

The baseline trash load described in Section 2.0, assumes that prior to adoption of the MRP the Town of Hillsborough (Town) has not adopted control measures to reduce trash from vehicles with uncovered loads. Therefore, implementation of any of the control measures described in this section is considered to be enhanced implementation.

Enhanced Level of Implementation

The Town will implement the development and inclusion of language in a Permittee's hauling service conditions of approval to require trash and construction debris hauler to cover loads when transporting trash and debris to municipality or private-owner landfills and transfer stations; and actively work with local law enforcement to establish an enhanced program for vehicles with uncovered loads. The enhanced program will prohibit the transportation of trash or debris without a cover, issue citations and fines for vehicles spotted on the roads, prior to July 1, 2014.

Percent Reduction from Enhancements

The Town will receive a 5% reduction credit for implementing specific enhanced control measures described in *Description of Enhanced Level of Implementation* section above. The 5% reduction credit will be applied to the baseline trash load to urban creeks from the municipal separate storm sewer system (MS4) owned and operated by the Town. This percent reduction credit was obtained from the *Trash Load Reduction Tracking Method Report* (BASMAA 2011e) and is presented in the Trash Load Reduction Summary Table included in Section 4.

³ In accordance with the California Vehicle Code Sections 23114 and 23115, it is against the law to operate a vehicle on the highway which is improperly covered, constructed, or loaded so that any part of its contents or loads spills, drops, leaks, blows, or otherwise escapes from the vehicle. Exempted materials include hay and straw, clear water and feathers from live birds. Additionally, any vehicle transporting garbage, trash, or rubbish, used cans or bottles, waste papers, waste cardboard, etc. must have the load covered to prevent any part of the load from spilling on the highway (CVC 2011). Significant fines are possible for non-compliance.

CR-3: Anti-Littering and Illegal Dumping Enforcement Activities

Successful anti-littering and illegal dumping enforcement activities include laws or ordinances that make littering or dumping of trash illegal. Laws are enforced by various municipal agency staff (e.g., police, sheriff and public works department staff) who issue citations in response to citizen complaints or other enforcement methods (e.g., surveillance cameras, signage and/or physical barriers installed at illegal dumping hot spots). In some California jurisdictions, the minimum fine for littering is \$500 and the maximum penalty for highway littering is \$1000 (City of San Francisco 2001). However, it is difficult to enforce small littering events unless they are witnessed or solid proof exists linking the offender to the litter. As a result, enforcement tends to focus on larger scale illegal dumping activities.

Baseline Level of Implementation

The baseline trash load described in Section 2.0, assumes that the Town of Hillsborough has adopted a basic anti-littering and illegal dumping enforcement program that entails receiving and responding to complaints from citizens as resources allow. The Town's enforcement program is part of the Municipal Code under the Nuisance Chapter. The Town currently has a successful implementation of an active anti-littering and illegal dumping enforcement program. The program includes thorough investigations of complaints received for an illegal dumping from the Public Works, Police and Building Departments. Implementation of enforcement procedures include citations (as warranted), and the collection of evidence from illegal dump sites in an attempt to identify offenders.

Enhanced Level of Implementation

The Town of Hillsborough will implement installation of physical barriers (e.g., fences, walls) or physical improvements (e.g., maintenance) which eliminate or deter illegal dumping at high priority sites identified within the Town's jurisdictional areal prior to July 1, 2014.

Percent Reduction from Enhancements

The Town of Hillsborough will receive a 4% reduction credit for implementing specific enhanced control measures described in *Description of Enhanced Level of Implementation* section above. The 4% reduction credit will be applied to the baseline trash load to urban creeks from the municipal separate storm sewer system (MS4) owned and operated by the Town of Hillsborough. This percent reduction credit was obtained from the *Trash Load Reduction Tracking Method Report* (BASMAA 2011e) and is presented in the Trash Load Reduction Summary Table included in Section 4.

CR-4: Improved Trash Bin/Container Management

Receptacles used to place/store trash or recyclables prior to collection by a public agency or private waste hauler reduce the potential for littering and trash loading to stormwater conveyance systems and receiving waters (City of Los Angeles 2004). For the purposes of assigning trash load reduction credits, receptacles fall into the following two categories:

- **Private Trash/Recycling Bins:** A receptacle for placing trash or recyclables generated from a household or other location that is serviced by a trash hauler. Bins are specifically-designed, heavy-duty plastic wheeled containers with hinged lids; or large multi-yard metal or plastic containers rectangular in shape.
- **Public Area Trash Containers:** A receptacle for placing incidental trash generated in public spaces that provides people with a convenient and appropriate place to dispose of trash. The design and size of public area trash containers vary widely, depending on their setting and use.

The effectiveness of bins/containers and bins in reducing trash in the environment is likely dependent upon: the location and density of the receptacles, size of the bin/container in relationship to the size needed to service users, frequency of maintenance, and the ability of the bin/container to capture and contain the trash deposited.

Baseline Level of Implementation

The baseline trash load described in Section 2.0, assumes that the Town of Hillsborough has not implemented enhanced trash bin/container management practices prior to effective date of the MRP throughout the Town due to the fact that the Town is zoned residential. Instead the Town's Public Works Corporation Yard and other Town-owned facilities, the Town currently implements improved trash bins with a garbage/recycling company, Recology.

Enhanced Level of Implementation

The Town of Hillsborough has implemented households that have inadequate trash service; and through municipal code enforcement or other authorities requiring households to sufficiently remedy the issue. As part of the Town's strategic plan, the Town will collaboratively work with all departments to identify whether public area trash containers are sufficiently located near parks and Town-owned areas.

Percent Reduction from Enhancements

The Town of Hillsborough will receive a 4% reduction credit for implementing specific enhanced control measures described in *Description of Enhanced Level of Implementation* section above. The 4% reduction credit will be applied to the baseline trash load to urban creeks from the municipal separate storm sewer system (MS4) owned and operated by the Town. This percent reduction credit was obtained from the *Trash Load Reduction Tracking Method Report* (BASMAA 2011e) and is presented in the Trash Load Reduction Summary Table included in Section 4.

QF-1: Enhanced On-Land Trash Cleanups (Volunteers and/or Municipal)

On-land cleanups conducted by Permittees and volunteers have been successful in removing trash from identified trash hot spots and engaging local citizenry in improving their communities. Permittees have several programs in place to address on-land trash. Municipal efforts relate to ongoing beautification of impacted areas and coordination of cleanup events. Volunteer on-land cleanups involve the meeting of individuals, creek and watershed groups, civic organizations, businesses and others at designated or adopted on-land sites to remove trash. On-land trash cleanups are conducted as single-day or throughout the year.

Baseline Level of Implementation

The Town of Hillsborough implemented the following on-land cleanup activities prior to the effective date of the MRP. The Town currently conducts on-land cleanups from an identified trash hot spots through Municipal efforts on an annual basis. In addition, the conducts daily cleanups at public parks. These control measures are considered baseline because they were accounted for in the preliminary trash generation rates established through the BASMAA *Baseline Trash Loading Rates Project*. New or enhanced actions that began or are planned to begin after to the effective date of the MRP are described under the next section.

Enhanced Level of Implementation

Prior to July 1, 2014, the Town will be conducting or coordinating new or enhanced on-land trash cleanup activities listed below:

- Routine or regularly scheduled litter pick-up and removal
- Illegal dump site response and abatement
- Interagency cleanup coordination and cleanup
- Litter pick-up event coordination and cleanup

Town will be conducting or coordinating new or enhanced on-land trash cleanup activities by volunteers listed below:

- Organize single-day cleanup events at high-priority sites
- Organize routine cleanups at the hot spot

These on-land cleanups will be conducted or coordinated each year and the volume of trash removed will be tracked to demonstrate trash loads reduced.

Please note that **only trash that has the potential of entering the MS4 will be tracked**. As a result, large items (e.g., appliances, shopping carts, furniture, mattresses, televisions, tires, lumber, etc.) that will be removed during on-land trash cleanups are not part of the volume determination since they do not have the potential of entering the MS4.

Percent Reduction from Enhancements

The total estimated annual volume of trash that will be reduced beginning July 1, 2014 as a result of implementing on-land trash cleanups is 84 gallons. The Town's enhancement to current and new control measures will have a approximately a 123.7% reduction in the baseline trash load to urban creeks from the municipal separate storm sewer system (MS4) owned and

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operated by the Town. Both values provided within this section are included in Trash Load Reduction Summary Table included in Section 4.

QF-2: Enhanced Storm Drain Inlet Maintenance

In accordance with countywide Stormwater Conveyance System Operation and Maintenance Performance Standards, storm drain inlets are maintained at least once per year by Permittees. Permittees who have enhanced storm drain inlet maintenance by increasing the frequency of cleanouts may use the load of trash reduced to MS4s to demonstrate attainment of trash load reduction goals required by the MRP.

Baseline Level of Implementation

The baseline trash load described in Section 2.0 assumes that the Town of Hillsborough currently maintains and removes material from storm drain inlets at least once per year. This baseline frequency is consistent with the frequency of storm drain inlet maintenance in the Town prior to the effective date of the MRP.

Enhanced Level of Implementation

A total of 1,148 storm drain inlets will be maintained in the Town at higher frequencies prior to July 1, 2014. The Town will effectively design a plan to schedule increased cleaning activities to 30% - 40% above the baseline implementation. The enhanced frequency of maintenance and associated effectiveness ratings will be used to calculate loads reduced from enhanced maintenance. This load reduction calculation method is consistent with the trash load reduction tracking method (BASMAA 2011e).

Percent Reduction from Enhancements

The total estimated annual volume of trash that will be reduced by July 1, 2014 as a result of implementing enhanced storm drain inlet maintenance is 10 gallons. This volume is equal to approximately a 24.0% reduction in the baseline trash load to urban creeks from the municipal separate storm sewer system (MS4) owned and operated by the Town. Both values provided within this section are included in Trash Load Reduction Summary Table included in Section 4.

QF-3: Creek/Channel/Shoreline Cleanups

Creek/channel/shoreline cleanups have been successful in removing large amounts of trash from San Francisco Bay area creeks and waterways; and increasing citizen's awareness of trash issues within their communities. Creek/channel/shoreline cleanups are conducted as single-day events or throughout the year by volunteers and municipal agencies. Since volunteers and municipal agencies have the common goal of clean creeks and waterways, their efforts sometimes overlap. This is apparent with some municipal agencies using volunteers to help assess and clean designated trash hot spots during single-day volunteer events.

Baseline Level of Implementation

Trash reduced via creek/channel/shoreline cleanups was not accounted for in the Town of Hillsborough's baseline trash load described in Section 2.0. Therefore, implementation of any of the control measures described in this section is considered to be an enhancement and can be used to demonstrate progress towards load reduction goals.

Enhanced Level of Implementation

Prior to July 1, 2014, the Town will conduct MRP-required⁸ and the following non MRP-required creek/channel/shoreline cleanups⁹ listed below. Both types of cleanups will be conducted each year and the volume of trash removed will be tracked to demonstrate trash loads reduced.

Permittee & Volunteer Collaborative Activities

Single-day Efforts

- Trash Hot Spot Cleanups
- Coastal Cleanup Day (third Saturday in September)
- Other Organized Single-day Events in Town

On-going Efforts

- Other Organized Cleanup Efforts
- Individuals or Organized Groups
- Creek/Watershed Group
- Non-governmental Organizations (e.g., Save the Bay, etc.)

Permittee-led Cleanup Activities

On-going Efforts

- Routine or Regularly Scheduled Creek Maintenance
- Illegal Dump Site Correction
- Measure-funded Programs
- Other On-going Cleanup Efforts

Percent Reduction from Enhancements

The total estimated annual volume of trash that will be reduced by July 1, 2014 as a result of implementing creek/channel/shoreline cleanups is 101 gallons. This volume is equal to

⁸ Creek/channel/shoreline cleanups conducted in accordance with Permit Provision C.10.b.

⁹All "other" creek/channel/shoreline cleanups conducted by a municipality that are not required by Provision C.10.b.

approximately a 27.2% reduction in the baseline trash load to urban creeks from the municipal separate storm sewer system (MS4) owned and operated by the Town. Both values provided within this section are included in Trash Load Reduction Summary Table included in Section 4.

5.0 SUMMARY OF TRASH CONTROL MEASURE ENHANCEMENTS

The Town of Hillsborough is committed to reducing the potential for trash impacts in local water bodies in the San Francisco Bay Area. The planned enhanced trash control measures described in Section 3.0 are also listed in Table 4-1. The enhancements are intended to comply with the 40% trash load reduction goal in MRP provision C.10.

Table 5.1: Planned enhanced trash control measure implementation within the jurisdictional boundaries of the Town of Hillsborough and associated trash loads reduced.

Trash Control Measure	Summary Description of Control Measure	% Reduction (Credits)	Trash Load Reduced	Cumulative % Reduction (Compared to Baseline)
Public Education and Outreach Programs (CR-1)	Increase participation and contribution to outreach programs, advertising campaigns, community events and media relations through collaborative efforts with the countywide program or individually as a Town.	8	249	8.0
Activities to Reduce Trash from Uncovered Loads (CR-2)	Adopt customized conditions of approval to require trash and construction debris hauler to cover during transportation; and enhancement to prohibit the transportation of trash or debris without a cover.	5	156	13.0
Anti-Littering and Illegal Dumping Enforcement Activities (CR-3)	Implementation to install physical barriers or physical improvements such as parks.	4	125	17.0
Improved Trash Bin/Container Management (Municipally or Privately-Controlled) (CR-4)	Implementation to inter-department efforts to ensure that public areas have adequate trash containers and services.	4	125	21.0
On-land Trash Cleanups (Volunteer and/or Municipal) (QF-1)	Continue current level of implementation and to coordinate inter-department efforts for cleanups.	NA	84	23.7
Enhanced Storm Drain Inlet Maintenance (QF-2)	Increase maintenance frequency to inlets about 25%-40%	NA	10	24.0
Creek/Channel/Shoreline Cleanups (Volunteer and/or Municipal) (QF-3)	Implementation of current trash hot spot cleanups along the creek.	NA	101	27.2

5.1 Annual Reporting and Progress Towards Trash Load Reduction Goal(s)

Consistent with MRP Provision C.10.d (i), the Town of Hillsborough intends to report on progress towards MRP trash load reduction goals on an annual basis beginning with the Fiscal Year 2011-2012 Annual Report. Annual reports will include:

1. A brief summary of all enhanced trash load reduction control measures implemented to-date;
2. The dominant types of trash likely removed via these control measures;
3. Total trash loads removed (credits and quantifications) via each control measure implementation; and
4. A summary and quantification of progress towards trash load reduction goals.

Similar to other MRP provision, annual reporting formats will be consistent region-wide. Annual reports are intended to provide a summary of control measure implementation and demonstrate progress toward MRP trash reduction goals. For more detailed information on specific control measures, the Town will retain supporting documentation on trash load reduction control measure implementation. These records should have a level of specificity consistent with the trash load reduction tracking methods described in the *BASMAA Trash Load Reduction Tracking Method Technical Report* (BASMAA 2011e).

5.2 Considerations of Uncertainties

Baseline trash loading and load reduction estimates are based on the best available information at the time this Short-Term Plan was developed. As with any stormwater loading and reduction estimate, a number of assumptions were used during calculations and therefore uncertainty is inherent in the baseline trash load estimate presented in Section 2.0 and the load reduction estimate presented in this section. For these reasons, the baseline loading estimates presented in this plan should be considered first-order estimates. During the implementation of this Short-Term Plan and subsequent plans, additional information may become available to allow the calculation of a more robust baseline load.

6.0 IMPLEMENTATION SCHEDULE

Implementation of enhanced trash control measures by the Town of Hillsborough is currently planned to occur in a timeframe consistent with MRP requirements. A preliminary implementation schedule for all planned enhancements is described in Table 5-1. This schedule provides a timeframe for reducing trash discharged from the Town's MS4 by 40%.

Based on new information that becomes available during the implementation of this Short-Term Plan (e.g., revisions to baseline loading estimates or load reduction credits of quantification formulas), the Town may chose to amend or revise this Plan and/or the associated implementation schedule. If revisions or amendments occur, a revised Short-Term Plan and implementation schedule will be submitted to the Water Board via the Town's annual reporting process.

Table 5-1. Preliminary implementation schedule for enhanced trash control measures in the Town of Hillsborough.

Trash Control Measure	Beginning Date of Implementation
Public Education and Outreach Programs (CR-1)	Current and will enhance by end of fiscal year, 2011-2012.
Activities to Reduce Trash from Uncovered Loads (CR-2)	Current and will enhance by end of fiscal year, 2011-2012.
Anti-Littering and Illegal Dumping Enforcement Activities (CR-3)	Current and will enhance by end of fiscal year, 2011-2012.
Improved Trash Bin/Container Management (Municipally or Privately-Controlled) (CR-4)	Current and will enhance by end of fiscal year, 2011-2012.
On-land Trash Cleanups (Volunteer and/or Municipal) (QF-1)	Current and will enhance by end of fiscal year, 2011-2012.
Enhanced Storm Drain Inlet Maintenance (QF-2)	By end of fiscal year, 2011-2012.
Creek/Channel/Shoreline Cleanups (Volunteer and/or Municipal) (QF-3)	Current and will enhance by end of fiscal year, 2011-2012.

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