

# Baseline Trash Load and Short-Term Trash Load Reduction Plan

---

Submitted by:



**City of Burlingame  
1361 N. Carolan Ave.  
Burlingame, CA 94010**

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

**February 1, 2012**

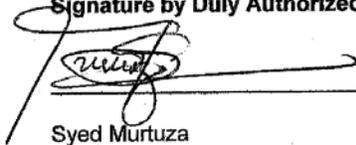
Page Intentionally Left Blank

**City of Burlingame, CA  
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 black ink, appearing to read 'Syed Murtuza', is written over a horizontal line. The signature is stylized and cursive.

Syed Murtuza  
Director of Public Works

1-24-12

# TABLE OF CONTENTS

**CERTIFICATION STATEMENT** .....ERROR! BOOKMARK NOT DEFINED.

**TABLE OF CONTENTS**.....4

**LIST OF TABLES** .....5

**LIST FIGURES**.....5

**ABBREVIATIONS**.....6

**PREFACE** .....7

**1.0 INTRODUCTION** .....8

    BASELINE TRASH GENERATION RATES PROJECT .....8

    TRASH LOAD REDUCTION TRACKING METHOD SUMMARY .....9

    SHORT-TERM TRASH LOAD REDUCTION PLAN .....9

**2.0 BASELINE TRASH LOADING ESTIMATE** .....11

    PERMITTEE CHARACTERISTICS .....11

    DEFAULT TRASH GENERATION RATES (REGIONAL APPROACH) .....12

    JURISDICTIONAL AND EFFECTIVE LOADING AREAS .....12

    PERMITTEE-SPECIFIC BASELINE TRASH LOADING RATES .....13

*Baseline Street Sweeping* .....13

*Baseline Storm Drain Inlet Maintenance* .....14

*Baseline Stormwater Pump Station Maintenance* .....14

    BASELINE TRASH LOADING ESTIMATE .....14

**3.0 LOAD REDUCTION CALCULATION PROCESS** .....17

    STEP #1: EXISTING ENHANCED STREET SWEEPING .....17

    STEP #2: TRASH GENERATION REDUCTION CONTROL MEASURES .....18

    STEP #3: ON-LAND INTERCEPTION CONTROL MEASURES .....18

    STEP #4: CONTROL MEASURES THAT INTERCEPT TRASH IN THE MS4 .....19

    STEP #5: CONTROL MEASURES THAT INTERCEPT TRASH IN WATERWAYS .....19

    STEP #6: COMPARISON TO BASELINE TRASH LOAD .....19

**4.0 ENHANCED TRASH CONTROL MEASURES** .....20

    CR-2: POLYSTYRENE FOAM FOOD SERVICE WARE POLICY .....21

*Baseline Level of Implementation* .....21

*Enhanced Level of Implementation* .....21

*Percent Reduction from Enhancements* .....21

    CR-3: PUBLIC EDUCATION AND OUTREACH PROGRAMS .....22

*Baseline Level of Implementation* .....22

*Enhanced Level of Implementation* .....22

*Percent Reduction from Enhancements* .....25

    CR-4: REDUCTION OF TRASH FROM UNCOVERED LOADS .....26

*Baseline Level of Implementation* .....26

*Percent Reduction from Enhancements* .....26

    CR-5: ANTI-LITTERING AND ILLEGAL DUMPING ENFORCEMENT ACTIVITIES .....27

*Baseline Level of Implementation* .....27

*Percent Reduction from Enhancements* .....27

    CR-6: IMPROVED TRASH BIN/CONTAINER MANAGEMENT .....28

*Baseline Level of Implementation* .....28

*Enhanced Level of Implementation* .....28

*Percent Reduction from Enhancements* .....29

QF-2: ENHANCED STREET SWEEPING .....30

*Baseline Level of Implementation* .....30

*Enhanced Level of Implementation* .....30

*Percent Reduction from Enhancements* .....30

QF-5: FULL-CAPTURE TREATMENT DEVICES .....33

*Baseline Level of Implementation* .....33

*Enhanced Level of Implementation* .....33

*Percent Reduction from Enhancements* .....33

QF-6: CREEK/CHANNEL/SHORELINE CLEANUPS .....32

*Baseline Level of Implementation* .....33

*Enhanced Level of Implementation* .....33

*Percent Reduction from Enhancements* .....33

**5.0 SUMMARY OF TRASH CONTROL MEASURE ENHANCEMENTS.....37**

5.1 ANNUAL REPORTING AND PROGRESS TOWARDS TRASH LOAD REDUCTION GOAL(S) .....41

5.2 CONSIDERATIONS OF UNCERTAINTIES .....41

**6.0 IMPLEMENTATION SCHEDULE.....42**

**7.0 REFERENCES .....44**

**LIST OF TABLES**

**1-1** Trash control measures for which load reduction quantification credits or formulas were developed to track progress towards trash load reduction goals.

**2-1** Regional Default Annual Trash Generation Rates by Land Use Category

**2-2** Jurisdictional areas and effective loading areas in the City of Burlingame by land use classes identified by ABAG (2005).

**2-3** Preliminary Annual Trash Baseline Load for the City of Burlingame

**4-1** Trash control measures that will be implemented by *City of Burlingame* to reach the 40% trash load reduction.

**5-1** Planned enhanced trash control measure implementation within the jurisdictional boundaries of the City of Burlingame and associated trash loads reduced.

**6-1** Preliminary implementation schedule for enhanced trash control measures in the City of Burlingame

**QF - 2-1** Planned enhanced street sweeping program in the City of Burlingame

**QF - 6-1** Trash full-capture treatment devices within the jurisdictional boundaries of the City of Burlingame.

**LIST FIGURES**

**2-1** Estimated trash baseline loading rates for geographical areas in the City of Burlingame

**QF –6-1** Broadway – Full Capture Devices

**QF –6-1** Burlingame - Full Capture Devices

## 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
CY	Cubic Yards
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 City of Burlingame 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 City of Burlingame's annual reporting process.

## 1.0 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 City of Burlingame 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 percent). 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 2012b).

## 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 percent). 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 2012a). 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 2012a).

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 (2012a). 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 City of Burlingame 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 City of Burlingame’s annual reporting process.

**Table 1-1. Trash control measures for which load reduction quantification credits or formulas were developed to track progress towards trash load reduction goals.**

<b>Load Reduction Credits</b>
Single-use Carryout Plastic Bag Ordinances
Polystyrene Foam Food Service Ware Ordinances
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
Single-Use Food and Beverage Ware Ordinances
<b>Quantification Formulas</b>
On-land Trash Pickup (Volunteer and/or Municipal)
Enhanced Street Sweeping
Partial-Capture Treatment Devices
Enhanced Storm Drain Inlet Maintenance
Full-Capture Treatment Devices
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:** Tables and information presented in this section are subject to change based on the results of a third monitoring event of the BASMAA Baseline Trash Generation Rates Project. Therefore, this section of the Short-Term Plan may be updated with revised trash generation rates, baseline loading rates, and baseline loads.

This section provides the estimated annual trash baseline load from the City of Burlingame's Municipal Separate Storm Sewer System (MS4). In compliance with Provision C.10.a.ii of the MRP, the City of Burlingame 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 (2012b) 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:

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

### Permittee Characteristics

Incorporated in 1908, the City of Burlingame covers 2,958 acres in Santa Mateo County, and has a jurisdictional area of 2,369 acres. According to the 2010 Census, it has a population of 28,806, with a population density of 4,755.8 people per square mile, and average household size of 2.29. Of the 28,806 who call the City of Burlingame home, 21.7% are under the age of 18, 5.2% are between 18 and 24, 30.8% are between 25 and 44, 28.2% are between 45 and 65, and 14% are 65 or older.

Top employers in the City of Burlingame include Hyatt Regency San Francisco Airport, ECC, Critchfield Mechanical, San Francisco Marriott, and LSG Sky Chefs. The median household income was \$91,309 in 2000<sup>1</sup>.

---

<sup>1</sup> From the 2000 Census. The median household income for the City of Burlingame from the 2010 Census is not currently available.

## 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 City of Burlingame. The City of Burlingame’s jurisdictional areas includes all urban land areas within the City of Burlingame 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 City’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);
- Water and Wastewater Treatment Facilities; and
- Other Transportation Facilities (e.g., airports, railroads, and maritime shipping ports).

Once the City of Burlingame’s jurisdictional area was delineated, an effective trash loading area was developed by creating a 200-foot buffer around all streets within the City’s jurisdictional area. The

purpose of the effective loading area is to eliminate land areas not directly contributing trash to the City’s MS4 (e.g., large backyards and rooftops). Both the jurisdictional and the effective loading areas for the City of Burlingame are presented in Table 2-2.

**Table 2-2. Jurisdictional areas and effective loading areas in the City of Burlingame 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	435	425	21
Low Density Residential	1,088	1,053	52
Rural Residential	24	8	0
Commercial and Services/ Heavy, Light and Other Industrial	478	321	16
Retail and Wholesale	139	112	6
K-12 Schools	92	47	2
Urban Parks	113	61	3
<b>TOTAL</b>	<b>2,369</b>	<b>2,027</b>	<b>100%</b>

### 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 City of Burlingame 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 City. 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 City of Burlingame 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 City of Burlingame 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 City of Burlingame's baseline street sweeping program includes sweeping streets in residential areas and arterials roads twice per month between April and September, and once a week from October to March. Streets in the downtown areas are swept weekly (Monday to Saturday). Parking enforcement signs for street sweeping are posted only on residential streets south of Broadway. However, there is no regular enforcement. Parking enforcement equivalent occurs in commercial areas west of the railroad tracks as well as some adjacent streets. The estimated trash load reduced via baseline street sweeping is presented in Table 2-3.

### **Baseline Storm Drain Inlet Maintenance**

Within the City, 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 City of Burlingame 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 City of Burlingame owns and maintains five stormwater pump stations. All five have trash racks that capture trash and allow for removal during maintenance. The City of San Mateo also owns one pump station with trash racks which drains a portion of Burlingame.

The estimated volume of trash removed annually from these pump stations 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 City of Burlingame was calculated as the sum of the loads from the City'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 City of Burlingame 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, and high trash loading rates.

**Table 2-3. Preliminary annual trash baseline load for the City of Burlingame.**

Category	Annual Load (gallons)
Preliminary Generation Trash Load	14,940
Load Removed via Baseline Street Sweeping	5,562
Load Removed via Baseline Storm Drain Inlet Maintenance	471
Load Removed via Baseline Stormwater Pump Station Maintenance	896
<b>Preliminary Trash Baseline Load</b>	<b>8,048</b>

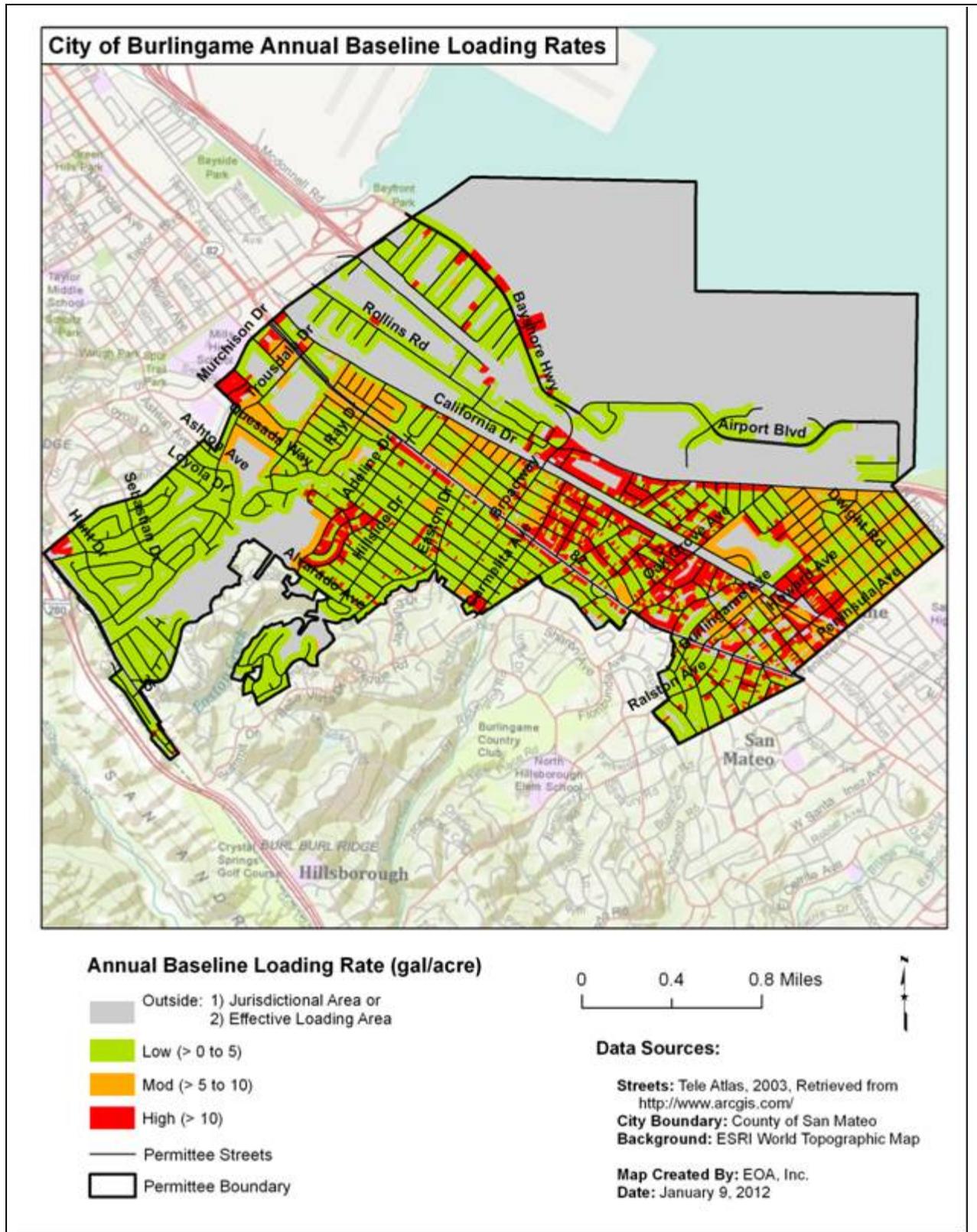


Figure 2-1. Estimated trash baseline loading rates for geographical areas in the City of Burlingame.

### 3.0 LOAD REDUCTION CALCULATION PROCESS

Using the guiding principles and assumptions described BASMAA (2012a), 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 2012a) 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
- 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 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: Single-Use Carryout Plastic Bag Ordinances
- CR-2: Polystyrene Foam Food Service Ware Ordinances
- CR-3: Public Education and Outreach Programs
- CR-4: Reduction of Trash from Uncovered Loads
- CR-5: Anti-Littering and Illegal Dumping Enforcement
- CR-6: Improved Trash Bin/Container Management
- CR-7: Single-Use Food and Beverage Ware Ordinances

Load reductions associated with trash generation reduction control measures are applied on an area-wide basis.<sup>2</sup> 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 #3.

## 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)
- QF-2: Enhanced Street Sweeping (Area-specific)

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).

---

<sup>2</sup> 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-3a: Partial-capture Treatment Device: Curb Inlet Screens (Area-specific)
- QF-3b: Partial-capture Treatment Device: Stormwater Pump Station Trash Racks Enhancements (Area-specific)
- QF-4: Enhanced Storm Drain Inlet Maintenance (Area-specific)
- QF-5: Full-Capture Treatment Devices (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-3c: Partial-capture Treatment Device: Litter Booms/Curtains (Area-wide)
- QF-6: 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 five 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.

$$\frac{\text{Baseline Load} - \text{Remaining Load}}{\text{Baseline Load}} \cdot 100 = \% \text{ Reduction}$$

## 4.0 ENHANCED TRASH CONTROL MEASURES

This section describes the new or enhanced trash control measures planned for implementation by the *City of Burlingame*. 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 *City of Burlingame* include those listed in Table 4.1.

**Table 4-1. Trash control measures that will be implemented by *City of Burlingame* to reach the 40% trash load reduction.**

Control Measure
Polystyrene Foam Food Service Ware Policy
Public Education and Outreach Programs
Reduction of Trash from Uncovered Loads
Anti-Littering and Illegal Dumping Enforcement Activities
Improved Trash Bin/Container Management (Municipally or Privately-Controlled)
Enhanced Street Sweeping
Full-Capture Treatment Devices
Creek/Channel/Shoreline Cleanups (Volunteer and/or Municipal)

## CR-2: Polystyrene Foam Food Service Ware Policy

Polystyrene foam is used as food ware in the food service industry. According to the USEPA, floatable debris in waterways, such as products made of polystyrene, is persistent in the environment and has physical properties that can have serious impacts on human health, wildlife, the aquatic environment and the economy (USEPA 2002). Due to its properties, polystyrene foam used as food ware is typically not recycled. Since 1990, over 100 government agencies within the United States, including over twenty within the Bay area have enacted full or partial bans on polystyrene foam food service ware.

### Baseline Level of Implementation

Prior to adoption of the MRP, over twenty agencies within the Bay area enacted full or partial bans on polystyrene foam food service ware. To avoid penalizing these early implementers, an applicable control measure implemented by a Permittee prior to the effective date of the MRP will be credited equally to a control measure implemented after the effective date. Therefore, the baseline level of implementation is not applicable for this control measure.

### Enhanced Level of Implementation

City of Burlingame adopted an ordinance banning polystyrene foam food service ware at the point-of-sale in 2011. Ordinance 1861-2011, prohibits the use and distribution of polystyrene based disposable food service ware by food vendors within the boundaries of the City of Burlingame. The ordinance became effective January 1, 2012. The percent trash reduction from MS4s as a result of implementing a polystyrene foam food service ware ordinance will be reported in the Annual Report submitted each September. The City of Burlingame, in conjunction with the Burlingame Chamber of Commerce, held two public meetings in April 2011 to share information on the reasons for implementing an ordinance. The Ordinance was introduced May 2, 2011 at the City Council meeting. A public hearing followed on May 16, 2011, at which time the ordinance was adopted. County Health Inspectors would be tasked with enforcing the ban, since they already inspect food vendors on a regular basis.

### Percent Reduction from Enhancements

The City of Burlingame will receive 8 percent reduction credit for implementing specific enhanced control measures described in *Enhanced Level of Implementation* section above. The 8 percent reduction credit will be applied to the City of Burlingame's baseline trash load. This percent reduction credit is consistent with methods presented in the BASMAA (2012a). A summary of all load reductions anticipated through the implementation of this plan are included in Section 5.0.

## CR-3: 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.), 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 City of Burlingame implemented the following public education and outreach control measures prior to the effective date of the MRP. The following programs are in addition to the County outreach events done on a countywide level by SMCWPPP. The Bayfront Cleanup, Sewer Science at Burlingame High School, Green Street Faire and Art in the Park. 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. New actions or actions started prior to the effective date of the MRP and continued into the future are described under the next section.

### Enhanced Level of Implementation

The City of Burlingame will implement the following public education and outreach control measures prior to July 1, 2014:

#### Litter Reduction Advertising Campaign(s)

##### ***BASMAA Youth Outreach Campaign (Regional)***

Through participation and funding of the regional **BASMAA Youth Outreach Campaign** the City of Burlingame will implement an outreach campaign designed to reduce littering from the target audience in the Bay Area. The Youth Outreach Campaign was launched in September 2011 (post-MRP effective date) and aims to increase the awareness of Bay Area Youth (ages 16-24) on litter and stormwater pollution issues, and eventually change their littering behaviors. Combining the ideas of Community Based Social Marketing with traditional advertising, the Youth Campaign aims to engage youth to enable the peer-to-peer distribution of Campaign messages. The Campaign will at least run from FY 11-12 through FY 13-14. A brief description of the Campaign activities is provided below:

- Raising Awareness: The Campaign will begin by raising awareness of the target audience on litter and stormwater pollution issues. Partnerships with youth commissions, high schools, and other youth focused organizations will be developed to reach the target audience. Messages targeted to youth will be created and distributed via paid advertising, email marketing, Campaign website and social networking sites (e.g., Facebook and twitter).
- Engage the Youth - The advertisements will encourage the audience to participate in the Youth Campaign by joining a Facebook page, entering a contest, taking an online quiz, etc., and providing their contact information. At the beginning of FY 12-13, a video

contest will be launched to get Bay Area youth further involved in the Campaign. An online voting system will be used to select the winning entry. Media advertising will be conducted to promote the winning entry.

- **Change Behaviors:** To move the audience along the behavior change continuum, the Campaign will use electronic platforms such as email marketing and social networking sites to encourage participants to engage in increasingly more difficult behavior changes, such as participating in a clean-up, organizing a clean-up, etc.
- **Maintain Engagement:** The Campaign will continue to interact with the target audience through email marketing and social media websites.

The Youth Campaign will include a pre and post campaign survey to evaluate the effectiveness of outreach. The pre-campaign survey will be conducted in FY 11-12 and the post campaign survey in FY 13-14. Other evaluation mechanisms, such as website hits, number of youth engaged in the Campaign's social networking website, etc. will also be used to evaluate its effectiveness in increasing awareness and changing behavior.

### **Outreach to School-age Children or Youth**

#### ***Countywide Programs***

Through participation and funding of the San Mateo Countywide Water Pollution Prevention Program (SMCWPPP), the **City of Burlingame** plans to continue to implement litter reduction outreach to school-age children and youth. SMCWPPP currently oversees two contracts to provide direct outreach to grades K-12 in a school setting on behalf of all permittees. The contract for grades K-5 is currently held by the Banana Slug String Band, which performs a presentation called "We All Live Downstream." Through songs and interactive exercises, the message of not putting anything in the storm drains (including trash) is delivered, along with basic concepts of the water cycle and the impact of pollution on aquatic life. The second contract is held by Rock Steady Science, which presents "Water Pollution Prevention and Your Car" to high school students. A portion of this presentation is dedicated to watershed and storm drain education, and the impact of litter on local creeks and waterways. Both contracts are managed to ensure that schools in each community in the County are reached. For communities without High Schools, the feeder schools in neighboring communities are specifically targeted for presentations. In addition to outreach at the school sites, a number of student activity guides and coloring books related to watershed health and littering are provided to children who attend outreach events. Schools are also directly targeted in promotion of Coastal Cleanup Day.

In addition to the programs described above, *Recycleworks*, a branch of San Mateo County Public Works dedicated to promotion of recycling solid waste, plans to continue to conduct litter reduction activities. These include participating in the green schools program in which a school gets certified by achieving goals set from a menu of categories, one of which is litter reduction. In addition, *Recycleworks* conducts school assemblies and field trips focusing on litter reduction and recycling. They also conduct waste audits at schools to encourage waste reduction, and staff outreach events at schools. PIP is exploring the possibility of teaming up with *Recycleworks* to continue outreach to junior high and high school students after June 2012, when the current contract with Rock Steady Science expires.

### **Media Relations**

#### ***BASMAA Regional Media Relations Project (Regional)***

Through participation and funding of the **BASMAA Regional Media Relations Project**, the **City of Burlingame** plans to continue to implement a media relations project partially designed to reduce littering from target audiences in the Bay Area. The goal of the BASMAA Media Relations Project is to generate media coverage that encourages individuals to adopt behavior changes to prevent water pollution, including littering. At least two press releases or PSAs focus on litter issues each year (e.g., creek clean-up activities, preventing litter by using reusable containers, etc.).

#### ***Coastal Cleanup Day Promotion (Countywide)***

On the countywide level, SMCWPPP also conducts annual press releases for Coastal Cleanup Day, and uses Twitter to promote cleanup events. These releases are intended to gain support and assistance for cleanup events conducted each September in local water bodies.

### **Community Outreach Events**

SMCWPPP, through its Public Information and Participation (PIP) program, plans to continue to conduct community outreach events on behalf of Permittees who request support. Outreach materials related to litter that are distributed include, in addition to the children's materials listed above under Outreach to School-age Children or Youth, a promotional sign for cigarette smokers to discourage cigarette litter, and pocket ashtrays are given out. A general stormwater pollution prevention flyer in English and Spanish that includes litter reduction in its messaging is distributed. In addition to table outreach events conducted for specific permittees, PIP also conducts a Countywide Event aimed to reach residents from throughout the county. PIP manages an online calendar which promotes cleanup events by non-profit organizations throughout the county. In FY 2011, PIP completed its 6<sup>th</sup> year acting as the county coordinator for Coastal Cleanup Day, increasing volunteer participation by 400% in that time, and trash removal increased by 300%.

During the term of the MRP, new outreach materials are also being considered for dissemination to the public, including reusable shopping bags to encourage reduction in use of plastic carryout bags. In addition, spring cleanups taking place in individual jurisdictions are planned to be promoted under one theme by PIP, who will assist directing volunteers to cleanup events in their communities. SMCWPPP is planning to conduct a total of 10-12 outreach events on behalf of various jurisdictions within the county in the 2011-12 fiscal year. SMCWPPP will also continue maintaining an online calendar of cleanups on a monthly basis.

### **Percent Reduction from Enhancements**

The City of Burlingame will receive a total 8 percent reduction credit for implementing specific enhanced control measures described in *Enhanced Level of Implementation* section above. This percent reduction is comprised of the following credits, consistent with the *Load Reduction Tracking Method*:

- Litter Reduction Advertising Campaigns – 3%
- Outreach to School-age Children or Youth – 2%
- Media Relations – 1%
- Community Outreach Events - 2%

These 8 percent reduction credits will be applied against the City of Burlingame’s baseline trash load. This percent reduction credit is consistent with methods presented in the BASMAA (2012a). A summary of all load reductions anticipated through the implementation of this plan are included in Section 5.0.

## CR-4: Reduction of Trash from Uncovered Loads

Although it is currently illegal to operate a vehicle that is improperly covered and which its' contents escapes<sup>3</sup>, 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 City of Burlingame 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 City of Burlingame will implement the following enhanced control measures to reduce trash from vehicles with uncovered loads prior to July 1, 2014:

- Prescriptive language in municipal contracts for trash and debris haulers to enforce the California Vehicle codes.

After which time, Public Works will engage with the Burlingame Police Department to inform of the changes in the municipal contract and ask for support through citations and fines for vehicles spotted on roads in our jurisdictional area.

### Percent Reduction from Enhancements

The City of Burlingame will receive a 1 percent reduction credit for implementing specific enhanced control measures described in the *Enhanced Level of Implementation* section above. The 1 percent 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 City of Burlingame. This percent reduction credit was obtained from the *Trash Load Reduction Tracking Method Report* (BASMAA 2012a) and is presented in the Trash Load Reduction Summary Table included in Section 5.0.

---

<sup>3</sup> 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-5: 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 City of Burlingame has adopted a basic anti-littering and illegal dumping enforcement program that entails receiving and responding to complaints from citizens as resources allow. The City of Burlingame thoroughly investigates all complaints received and/or related to an illegal dumping and utilizes staffing through the Public Works department for clean up.

### Enhanced Level of Implementation

The City of Burlingame has implemented the following enhanced anti-littering and illegal dumping enforcement control measures:

- Anti-littering and illegal dumping investigation and enforcement program - The Public Works Department utilizes staff to enforce illegal dumping by reporting incidents to the Burlingame Code Enforcement Officer. The Public Works staff takes measures to collect any evidence (e.g., names, addresses, etc.). This information will be passed on to the Code Enforcement Officer in efforts to identify the offender(s).

### Percent Reduction from Enhancements

The City of Burlingame will receive a 2 percent reduction credit for implementing specific enhanced control measures described in the *Enhanced Level of Implementation* section above. The 2 percent 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 City of Burlingame. This percent reduction credit was obtained from the *Trash Load Reduction Tracking Method Report* (BASMAA 2012a) and is presented in the Trash Load Reduction Summary Table included in Section 5.0.

## CR-6: 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, business, 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 City of Burlingame has not implemented enhanced trash bin/container management practices prior to effective date of the MRP.

### Enhanced Level of Implementation

The City of Burlingame has implemented the following improved trash bin/container management practices prior to July 1, 2014:

- Ensuring adequate private trash service and enclosures by development and approval of an ordinance for appropriate trash services and identification and enforcement of inadequate trash service for private trash and recycling bins/containers. The City of Burlingame enforces the municipal code through the authorized franchise agreement set forth by City council to ensure proper collection.
- Implementation of a Strategic Plan for public area trash containers. The City of Burlingame identified high trash generating areas and installed trash bin, along with selected specialty bins (e.g., bins for cigarette butts, recycling) in specific locations. The bins are serviced weekly through the franchise agreement. Monitoring is provided by one full time Public Works maintenance worker in both business districts (Burlingame Ave and Broadway) to ensure proper trash removal.
- The Public Works department utilizes one full time maintenance worker to the two (2) Business Districts (Burlingame Ave and Broadway). The responsibilities incorporated by the employee are sidewalk sweeping, litter pickup and maintenance of public area trash containers at least once per week in retail/wholesale and commercial areas.

### **Percent Reduction from Enhancements**

The City of Burlingame will receive a combined total of 6 percent reduction credit for implementing specific enhanced control measures described in the *Enhanced Level of Implementation* section above. The 6 percent 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 City of Burlingame. This percent reduction credit was obtained from the *Trash Load Reduction Tracking Method Report* (BASMAA 2012a) and is presented in the Trash Load Reduction Summary Table included in Section 5.0.

## **QF-2: Enhanced Street Sweeping**

Street sweeping is conducted by most, if not all, Bay Area municipalities to remove trash and debris that collect in the gutters at the edge of streets. Parked cars and large storms that produce significant runoff can impact the effectiveness of street sweepers. However, increasing parking enforcement or more frequent street sweeping (as compared to the frequency of storm events) may increase the trash load reduced to MS4s. Permittees who choose to enhance street sweeping may do so to demonstrate trash load reductions to their MS4s and progress towards trash load reduction goals required by the MRP.

### **Baseline Level of Implementation**

The baseline trash load described in Section 2.0 incorporates the trash load reductions due to baseline street sweeping. The City of Burlingame's current street sweeping program is seasonal with most residential street and arterial streets swept once per week from October to April, and twice per month from April to September. The downtown areas of Broadway and Burlingame Avenues are swept six days a week all year long.

### **Enhanced Level of Implementation**

The City currently implements enhanced street sweeping above the baseline ceiling described in Section 2.0. These existing enhancements are seasonal, with most residential street and arterial streets swept at an enhanced frequency of once per week from October to March compared to twice per month from April to September. Additionally, the downtown areas of Broadway and Burlingame Avenues are swept six days a week during the entire year.

Enhancements to street sweeping frequencies described above were used to calculate loads reduced from existing enhanced street sweeping, consistent with the trash load reduction tracking method (BASMAA 2012a). A list of enhancements is included in Table QF-2-1 and illustrated in Figure QF-2-1.

### **Percent Reduction from Enhancements**

The total estimated annual volume of trash that will be reduced by July 1, 2014 as a result of existing enhanced street sweeping is 786 gallons per year. As described in Trash Load Reduction Summary Table included in Section 5.0, this volume is equal to approximately a 9.8 percent reduction in the baseline trash load to urban creeks from the municipal separate storm sewer system (MS4) owned and operated by the City of Burlingame.

Table QF-2-1 - Existing enhanced street sweeping program in the City of Burlingame.

Route ID	Approximate Length Swept (curb miles)	Baseline		Enhanced	
		Frequency	Parking Enforcement	Frequency	Parking Enforcement
Tract A & B (entire City boundaries)	14,859	<b>2x per month (April – Sept)</b>	<i>Select arterial streets (Broadway business district)</i>	<b>1x per week (Oct – March)</b>	<i>Select arterial streets (Broadway business district)</i>
Burlingame Avenue	2	<i>Daily</i>	<i>Swept prior to business Operating hours</i>	<i>Daily</i>	<i>Swept prior to business Operating hours</i>
Broadway Avenue	1	<i>Daily</i>	<i>Swept prior to business Operating hours</i>	<i>Daily</i>	<i>Swept prior to business Operating hours</i>

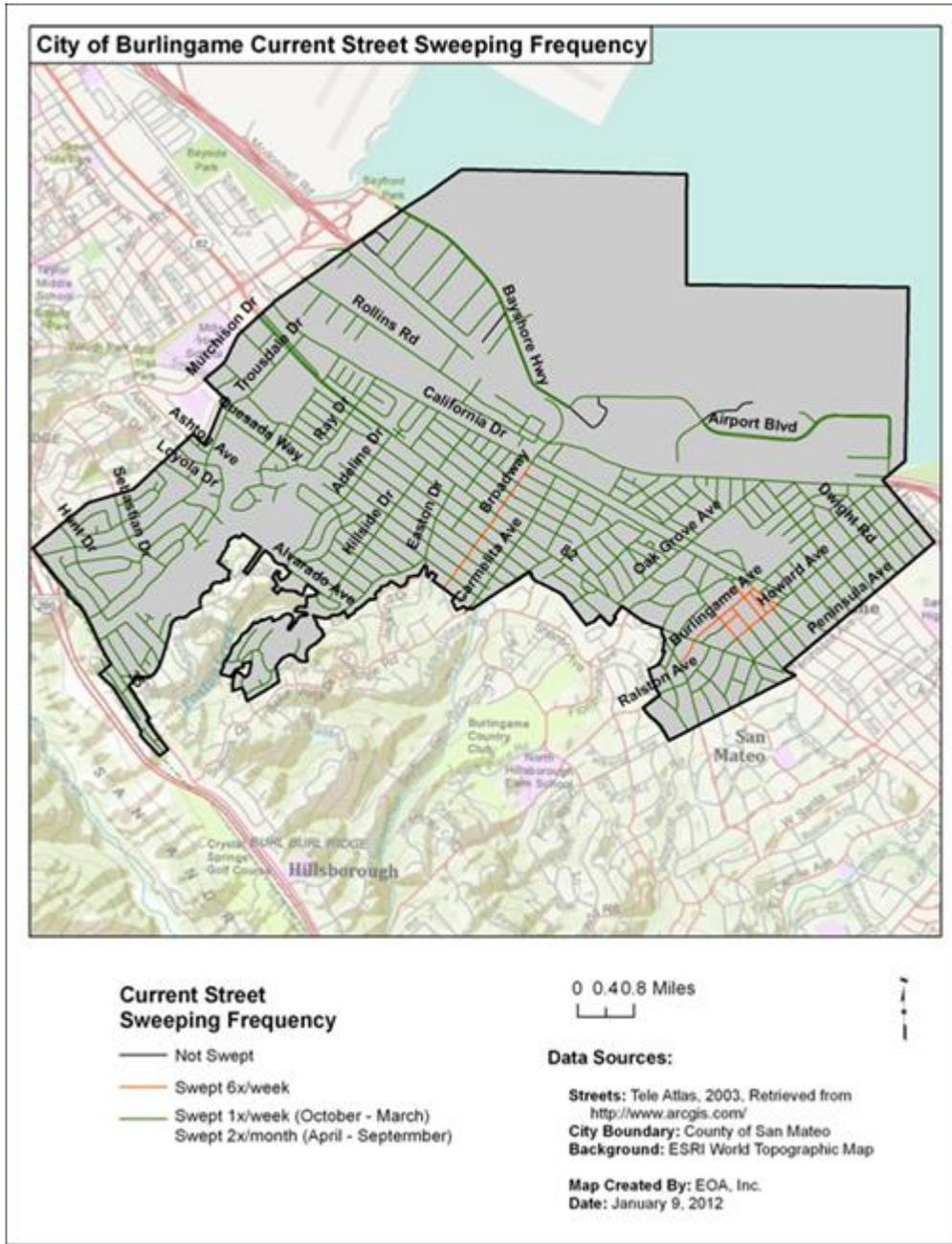


Figure QF-2-1: Planned enhanced street sweeping program in the City of Burlingame.

## QF-5: Full-Capture Treatment Devices

As defined by the Municipal Regional Stormwater Permit (MRP), a full-capture system or device is any single device or series of devices that traps all particles retained by a 5 mm mesh screen and has a design treatment capacity of not less than the peak flow rate (Q) resulting from a one-year, one-hour, storm in the sub-drainage area. A list of the full-capture systems and devices recognized by the San Francisco Bay Regional Water Quality Control Board (Water Board) is included in *Trash Load Reduction Tracking Method Report* (BASMAA 2012a). Trash loads reduced via publically or privately owned and operated devices within a Permittee's jurisdictional area that have been recognized by the Water Board as full-capture may be used to demonstrate attainment of trash load reduction goals.

### Baseline Level of Implementation

Prior to adoption of the MRP, some Permittees installed and maintained full capture devices. To avoid penalizing these early implementers, an applicable control measure implemented within a Permittee's jurisdictional area prior to the effective date of the MRP will be credited equally to a control measure implemented after the effective date. Therefore, the baseline level of implementation is no trash full-capture devices have been installed.

### Enhanced Level of Implementation

A total of 20 trash full-capture treatment devices have been or will be installed in the City of Burlingame prior to July 1, 2014. A list of these full-capture devices is included in Table QF-5-1. All devices listed within this table are enhanced trash control measures. Table QF-5-1 also includes the area treated and the calculated trash load reduced from each full-capture treatment device. These calculations are consistent with the approach described in the *Trash Load Reduction Tracking Method Report* (BASMAA 2012a).

### Percent Reduction from Enhancements

The total estimated annual volume of trash that will be reduced by July 1, 2014 as a result of implementing full capture devices is 260 gallons per year. This volume is equal to approximately a 3.3 percent reduction in the baseline trash load to urban creeks from the municipal separate storm sewer system (MS4) owned and operated by the City of Burlingame. Both values provided within this section are included in Trash Load Reduction Summary Table included in Section 5.0.

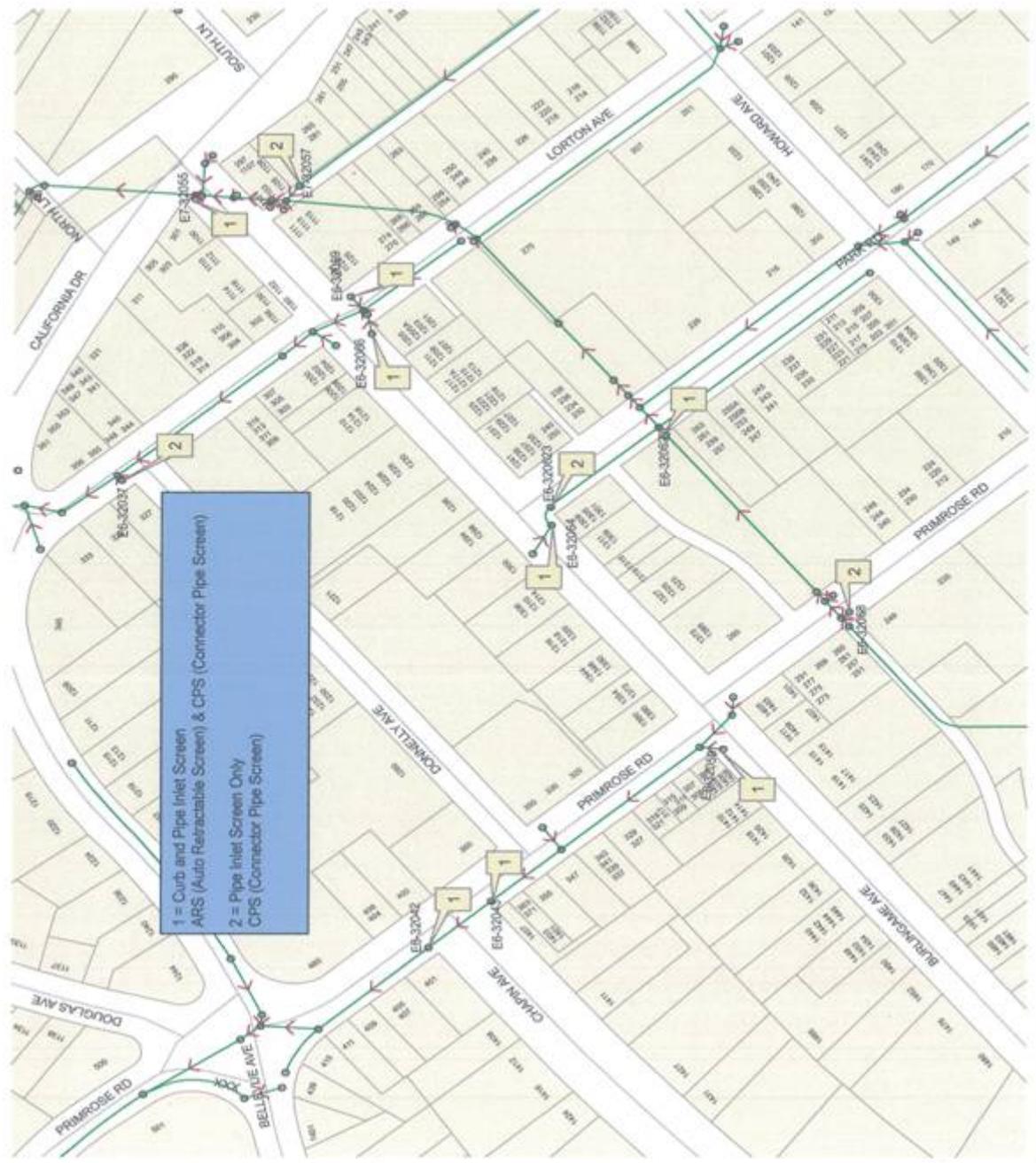
**Table QF-6-1. Trash full-capture treatment devices within the jurisdictional boundaries of the City of Burlingame.**

Device ID	Public or Private	Device Name	Location (Cross Streets)	Installation Date/Anticipated Installation Date	Estimated Total Area Treated (acres)	Estimated Trash Load Reduced
D5-32116	Public	ARS & CPS	1130 Broadway	May, 2010	7.4	60
D5-32103	Public	ARS & CPS	1163 Broadway	May, 2010		
D5-32098	Public	ARS & CPS	1204 Broadway	May, 2010		
D5-34006	Public	ARS & CPS	1201 Broadway	May, 2010		
D5-32088	Public	CPS	1236 Broadway	May, 2010		
D5-34004	Public	ARS & CPS	1306 Broadway	May, 2010		
D5-32073	Public	ARS & CPS	1400 Broadway	May, 2010		
D5-32075	Public	ARS & CPS	1126 Capuchino	May, 2010		
E7-32055	Public	ARS & CPS	1100 Burlingame Ave	May, 2010	32.9	200
E7-32057	Public	CPS	1105 Burlingame Ave (SD location on Hatch Ln)	May, 2010		
E6-32037	Public	CPS	327 Lorton Ave	May, 2010		
E6-32066	Public	ARS & CPS	1205 Burlingame Ave	May, 2010		
E6-32069	Public	ARS & CPS	1125 Burlingame Ave (CB on Lorton Side)	May, 2010		
E6-320623	Public	CPS	1301 Burlingame Ave (CB on Park Rd side)	May, 2010		
E6-32064	Public	ARS & CPS	1306 Burlingame Ave	May, 2010		
E6-32062	Public	ARS & CPS	263 Park Road	May, 2010		
E6-32068	Public	CPS	249 Primrose Road	May, 2010		
E6-32059	Public	ARS & CPS	1402 Burlingame Ave	May, 2010		
E6-32043	Public	ARS & CPS	371 Primrose Road	January 2012		
E6-32042	Public	ARS & CPS	401 Primrose Road	January 2012		

Figure QF-6-1a. - Broadway. Full Capture Devices



Figure QF-6-1b. Burlingame Ave. Full Capture



## **5.0 SUMMARY OF TRASH CONTROL MEASURE ENHANCEMENTS**

The City of Burlingame 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.

The City of Burlingame's planned enhance trash control measures will consist of the control measures as stated in section 4.0 and summarized in Table 5-1.

## QF-6: 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 City of Burlingame'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 City of Burlingame will conduct MRP-required<sup>4</sup> and the following non MRP-required creek/channel/shoreline cleanups<sup>5</sup> 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.

- Annual scheduled creek cleaning projects located at Lincoln Channel, Park Road Pits, California ditch, Mills Creek, Easton Creek and El Portal Channel.

### 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 between 400 and 2,000 gallons. The lower end of this estimate is equal to approximately a 5 percent reduction in the baseline trash load to urban creeks from the municipal separate storm sewer system (MS4) owned and operated by the City of Burlingame. The low estimate is provided in Trash Load Reduction Summary Table included in Section 5.0.

---

<sup>4</sup> Creek/channel/shoreline cleanups conducted in accordance with Permit Provision C.10.b.

<sup>5</sup> All "other" creek/channel/shoreline cleanups conducted by a municipality that are not required by Provision C.10.b.

## **5.0 SUMMARY OF TRASH CONTROL MEASURE ENHANCEMENTS**

The City of Burlingame 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.

The City of Burlingame's planned enhance trash control measures will consist of the control measures described in Section 4.0. Table 5-1 provides a summary of these planned actions.

**Table 5-1. Planned enhanced trash control measure implementation within the jurisdictional boundaries of the City of Burlingame and associated trash loads reduced.**

Trash Control Measure	Summary Description of Control Measure	% Reduction (Credits)	Trash Load Reduced (gals/year)	Cumulative % Reduction (Compared to Baseline)
Existing Enhanced Street Sweeping (QF-2)	Frequencies of 6x/week in retail areas and 1x/week in residential areas during the wet weather season	NA	786	9.8
Polystyrene Foam Food Service Ware Ban (CR-2)	Adoption of a local ordinance	8	579	17
Public Education and Outreach Programs (CR-3)	Active implementation of outreach programs	8	579	24.2
Activities to Reduce Trash from Uncovered Loads (CR-4)	Require Municipal Trash Haulers to Cover Loads	1	72	25.1
Anti-Littering and Illegal Dumping Enforcement Activities (CR-5)	Thorough investigations of complaints received from an illegal dumping	2	145	26.9
Improved Trash Bin/Container Management (Municipally or Privately-Controlled) (CR-6)	Ordinance for appropriate trash service & inspection and maintenance	6	434	32.3
Full-capture Treatment Devices (QF-5)	20 Full Capture devices installed	NA	260	35.6
Creek/Channel/Shoreline Cleanups (Volunteer and/or Municipal) (QF-6)	Annual scheduled creek cleaning projects located at Lincoln Channel, Park Road Pits, California ditch, Mills creek, Easton creek and El Portal Channel	NA	400	40.6

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

Consistent with MRP Provision C.10.d (i), the City of Burlingame 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 City of Burlingame 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 2012a).

## 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 City of Burlingame 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 City of Burlingame'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 City of Burlingame 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 City of Burlingame's annual reporting process.

Table 6-1. Preliminary implementation schedule for enhanced trash control measures in the City of Burlingame.

Trash Control Measure	Beginning Date of Implementation
Polystyrene Foam Food Service Ware Ban (CR-2)	January 1, 2012
Public Education and Outreach Programs (CR-3)	Pre-MRP
Activities to Reduce Trash from Uncovered Loads (CR-4)	Pre-MRP
Anti-Littering and Illegal Dumping Enforcement Activities (CR-5)	Pre-MRP
Improved Trash Bin/Container Management (Municipally or Privately-Controlled) (CR-6)	Pre-MRP
Enhanced Street Sweeping (QF-2)	Pre-MRP
Full-capture Treatment Devices (QF-5)	May 17, 2010

## 7.0 REFERENCES

- Allison R.A. and F.H.S. Chiew 1995. Monitoring stormwater pollution from various land uses in an urban catchment. Proceedings from the 2<sup>nd</sup> International Symposium on Urban Stormwater Management, Melbourne, 551-516.
- Allison, R.A., T.A. Walker, F.H.S. Chiew, I.C. O'Neill and T.A. McMahon 1998. From Roads to rivers: Gross pollutant removal from urban waterways. Report 98/6. Cooperative Research Centre for Catchment Hydrology. Victoria, Australia. May 1998.
- Armitage, N. 2001. The removal of Urban Litter from Stormwater Drainage Systems. Ch. 19 in Stormwater Collection Systems Design Handbook. L. W. Mays, Ed., McGraw-Hill Companies, Inc. ISBN 0-07-135471-9, New York, USA, 2001, 35 pp.
- Armitage, N. 2003. The removal of urban solid waste from stormwater drains. Prepared for the International Workshop on Global Developments in Urban Drainage Management, Indian Institute of Technology, Bombay, Mumbai India. 5-7 February 2003.
- Armitage, N. 2007. The reduction of urban litter in the stormwater drains of South Africa. *Urban Water Journal* Vol. 4, No. 3: 151-172. September 2007.
- Armitage N., A. Rooseboom, C. Nel, and P. Townshend 1998. "The removal of Urban Litter from Stormwater Conduits and Streams. *Water Research Commission* (South Africa) Report No. TT 95/98, Pretoria.
- Armitage, N. and A. Rooseboom 2000. The removal of urban litter from stormwater conduits and streams: Paper 1 – The quantities involved and catchment litter management options. *Water S.A.* Vol. 26. No. 2: 181-187.
- BASMAA (Bay Area Stormwater Management Agencies Association). 2011a. Progress Report on Methods to Estimate Baseline Trash Loads from Bay Area Municipal Stormwater Systems and Track Loads Reduced. February 2011.
- BASMAA (Bay Area Stormwater Management Agencies Association). 2011b. Method to Estimate Baseline Trash Loads from Bay Area Municipal Stormwater Systems: Technical Memorandum #1. Prepared by EOA, Inc. April 2011.
- BASMAA (Bay Area Stormwater Management Agencies Association). 2011c. Sampling and Analysis Plan. Prepared by EOA, Inc. April 2011.
- BASMAA (Bay Area Stormwater Management Agencies Association). 2011d. Trash Load Reduction Tracking Method: Technical Memorandum #1 – Literature Review. Prepared by EOA, Inc. May 2011.
- BASMAA (Bay Area Stormwater Management Agencies Association). 2012a. Trash Load Reduction Tracking Method: Technical Report. Prepared by EOA, Inc. February.
- BASMAA (Bay Area Stormwater Management Agencies Association). 2012b. Trash Baseline Generation Rates: Technical Report. Prepared by EOA, Inc. February.
- County of Los Angeles. 2002. Los Angeles County Litter Monitoring Plan for the Los Angeles River and Ballona Creek Trash Total Maximum Daily Load. May 30, 2002.
- County of Los Angeles. 2004a. Trash Baseline Monitoring Results Los Angeles River and Ballona Creek Watershed. Los Angeles County Department of Public Works. February 17, 2004.

County of Los Angeles 2004b. Trash Baseline Monitoring for Los Angeles River and Ballona Creek Watersheds. Los Angeles County Department of Public Works. May 6, 2004.

County of Los Angeles, Department of Public Works, Environmental Programs Division. 2007. *An Overview of Carryout Bags in Los Angeles County: A Staff Report to the Los Angeles County Board of Supervisors*. Alhambra, CA. [http://dpw.lacounty.gov/epd/PlasticBags/PDF/PlasticBagReport\\_08-2007.pdf](http://dpw.lacounty.gov/epd/PlasticBags/PDF/PlasticBagReport_08-2007.pdf). August 2007.

Kim, L.H, M. Kayhanian, M.K. Stenstrom 2004. Event mean concentration and loading of litter from highways during storms. *Science of the Total Environment* Vol 330: 101-113.