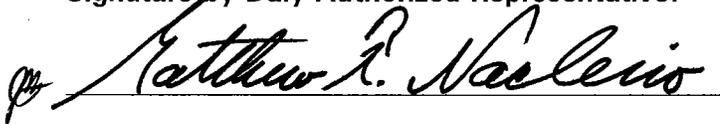


**CITY OF ALAMEDA  
BASELINE TRASH LOAD AND  
SHORT-TERM TRASH LOAD REDUCTION PLAN**

**CERTIFICATION STATEMENT**

"I certify, under penalty of law, that this document and all attachments were prepared either under my direction or supervision or were prepared by consultants of the Alameda Countywide Clean Water Program 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, reading "Matthew T. Naclerio", is written over a horizontal line. The signature is cursive and includes a small initial mark at the beginning.

Matthew T. Naclerio  
Public Works Director

February 1, 2012

# **City of Alameda**

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

---

**Submitted by:**

**City of Alameda**

**2263 Santa Clara Avenue**

**Alameda, CA 94501**

**Prepared by:**

**City of Alameda Public Works Department**

**950 West Mall Square, Room 110**

**Alameda, CA 94501**

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

**February 1, 2012**

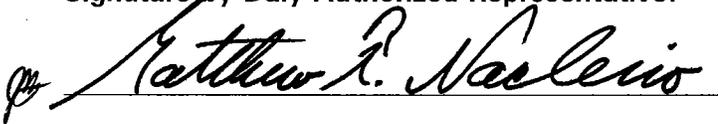
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Matthew T. Naclerio  
Public Works Director

February 1, 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
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 the City of Alameda as one of the 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) that links the results of the BASMAA *Trash Baseline Generation Rates Project (Project)* and the BASMAA *Trash Load Reduction Tracking Method* to the City of Alameda's specific, on-going trash load reduction activities. The City of Alameda may amend or revise this Plan if necessary to document on-going compliance with the MRP based either on new information that becomes available during the on-going implementation of the Project and/or this Plan (e.g., revisions to baseline loading estimates, load reduction credits or quantification formulas OR revisions to City of Alameda trash load reduction activities, etc.) or if circumstances arise during the implementation of the Plan that were not anticipated at the time of submission. If revisions or amendments are necessary, a revised Short-Term Plan will be submitted to the Water Board via the City of Alameda'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 (Plan) is submitted by the City of Alameda 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 BASMAA Baseline Trash Generation Rates and Trash Load Reduction 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 by July 1, 2014). The intent of the project was to: (a) provide a scientifically-sound method for developing (default) baseline trash generation rates that can be adjusted, based on Permittee/site specific conditions, and (b) 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).

The City of Alameda states its objection to the regional methodology for determining a jurisdiction's baseline trash load that makes a distinction between the background generated trash load and the estimated baseline trash load. Fairness-of-effort between all Permittee agencies for implementing equitable trash reduction levels would have been improved by identifying the "Generated load" value as the baseline load value directly. The City of Alameda has applied the regionally approved methodology in the preparation of this Plan, using the baseline value as provided by the regional consultant, but registers its fairness-critique here.

## **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 by July 1, 2014). 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 2012b). 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 trash load reduction 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 the City of Alameda's MS4 by July 1, 2014. This 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 2012b).

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 (2012b). If a Permittee chooses to do so, methods specific to calculating trash load reductions for that control measure would need to be developed. At that point, consideration would be given to updating this Plan.

The City of Alameda may amend or revise this Plan if necessary to document on-going compliance with the MRP based either on new information that becomes available during the on-going implementation of the Project and/or this Plan (e.g., revisions to baseline loading estimates, load reduction credits or quantification formulas OR revisions to City of Alameda trash load reduction activities, etc.) or if circumstances arise during the implementation of the Plan that were not anticipated at the time of submission. If revisions or amendments are necessary, a revised Short-Term Plan will be submitted to the Water Board via the City of Alameda’s annual reporting process.

**Table 1-1.** List of Trash control measures developed regionally.

<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 (Shoreline) Cleanups (Volunteer and/or Municipal)

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

- Introduction
- City of Alameda Baseline Trash Loading Estimate
- Load Reduction Calculation Process
- City of Alameda Enhanced Trash Control Measures
- Summary of City of Alameda Trash Load Control Measures
- Implementation Schedule
- References

## 2.0 CITY OF ALAMEDA BASELINE TRASH LOADING ESTIMATE

*Note: The results of a third monitoring event of the BASMAA Baseline Trash Loading Rates Project remain pending. The City of Alameda may amend or revise this Plan if necessary to document on-going compliance with the MRP based on new information that becomes available during the on-going implementation of the Project and/or this Plan (e.g., revisions to baseline loading estimates, load reduction credits or quantification formulas OR revisions to City of Alameda trash load reduction activities, etc.) or if circumstances arise during the implementation of the Plan that were not anticipated at the time of submission.*

This section provides the estimated annual trash baseline load from the City of Alameda's Municipal Separate Storm Sewer System (MS4). In compliance with Provision C.10.a.ii of the MRP, the City of Alameda worked collaboratively with other MRP Permittees through BASMAA to develop data and the process necessary to establish a 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 (2012a) 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 Alameda. 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 Alameda'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

Formed in 1916, Alameda is a charter city that covers 7,760 acres in Alameda County, and has a jurisdictional area of 4,180 acres. According to the 2010 Census, it has a population of 73,812, with a population density of 6,956.2 people per square mile, and average household size of 2.40. Of the 73,812 who call the City of Alameda home, 20.7% are under the age of 18, 7.4% are between 18 and 24, 28.5% are between 25 and 44, 29.9% are between 45 and 65, and 13.5% are 65 or older.

Top employers in the City of Alameda include US Coast Guard, Alameda Unified School District, Abbott Diabetes Care, Alameda Hospital, and the City of Alameda. The median household income was \$56,285 in 2000<sup>1</sup>.

## 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 Loading 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 Alameda. The City of Alameda’s jurisdictional areas includes all urban land areas within the City of Alameda 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 Alameda County;

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

- Colleges and Universities (Private or Public);
- Non-urban Land Uses (e.g., agriculture, open space, wetlands, water);
- Communication or Power Facilities;
- Water and Wastewater Treatment Facilities; and
- Other Transportation Facilities (e.g., airports, railroads, and maritime shipping ports).

Once the City of Alameda’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, open space). Both the jurisdictional and the effective loading areas for the City of Alameda are presented in Table 2-2.

**Table 2-2: Jurisdictional areas and effective loading areas in the City of Alameda 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	51	37	1
Low Density Residential	2,686	2,536	73
Rural Residential	107	102	3
Commercial and Services/ Heavy, Light and Other Industrial	520	299	9
Retail and Wholesale	352	278	7
K-12 Schools	117	95	3
Urban Parks	348	118	5
<b>TOTAL</b>	<b>4,180</b>	<b>3,465</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 Alameda 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 Alameda 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 Alameda 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 frequently than the baseline ceiling, their current sweeping frequency serves as their baseline.

The City of Alameda's baseline street sweeping program is equivalent to the baseline ceiling and includes sweeping most streets in residential areas twice per month, and sweeping in the two retail districts once per week. The City's current street sweeping program actually includes sweeping most streets in residential areas once per week, and sweeping in the two retail districts on a daily (i.e., Monday-Friday) basis, so the trash load reduction efforts achieved by these extra (i.e., above baseline ceiling) street sweeping activities are additionally accounted for under existing enhanced street sweeping (see Section 3, Step #1).

Posting of parking enforcement signs for street sweeping occurs on most arterial streets and streets near the downtown retail area and on numerous interspersed blocks throughout residential areas. The posting of parking enforcement signs for street sweeping on the arterial streets and streets near the downtown retail area was accounted for in the GIS analysis used to prepare the City of Alameda's baseline trash load estimate. Parking enforcement equivalent exists on a limited number of arterial streets within the City. The estimated trash load reduced via baseline street sweeping is presented in Table 2-3.

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

Within the City of Alameda, 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 Alameda 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***

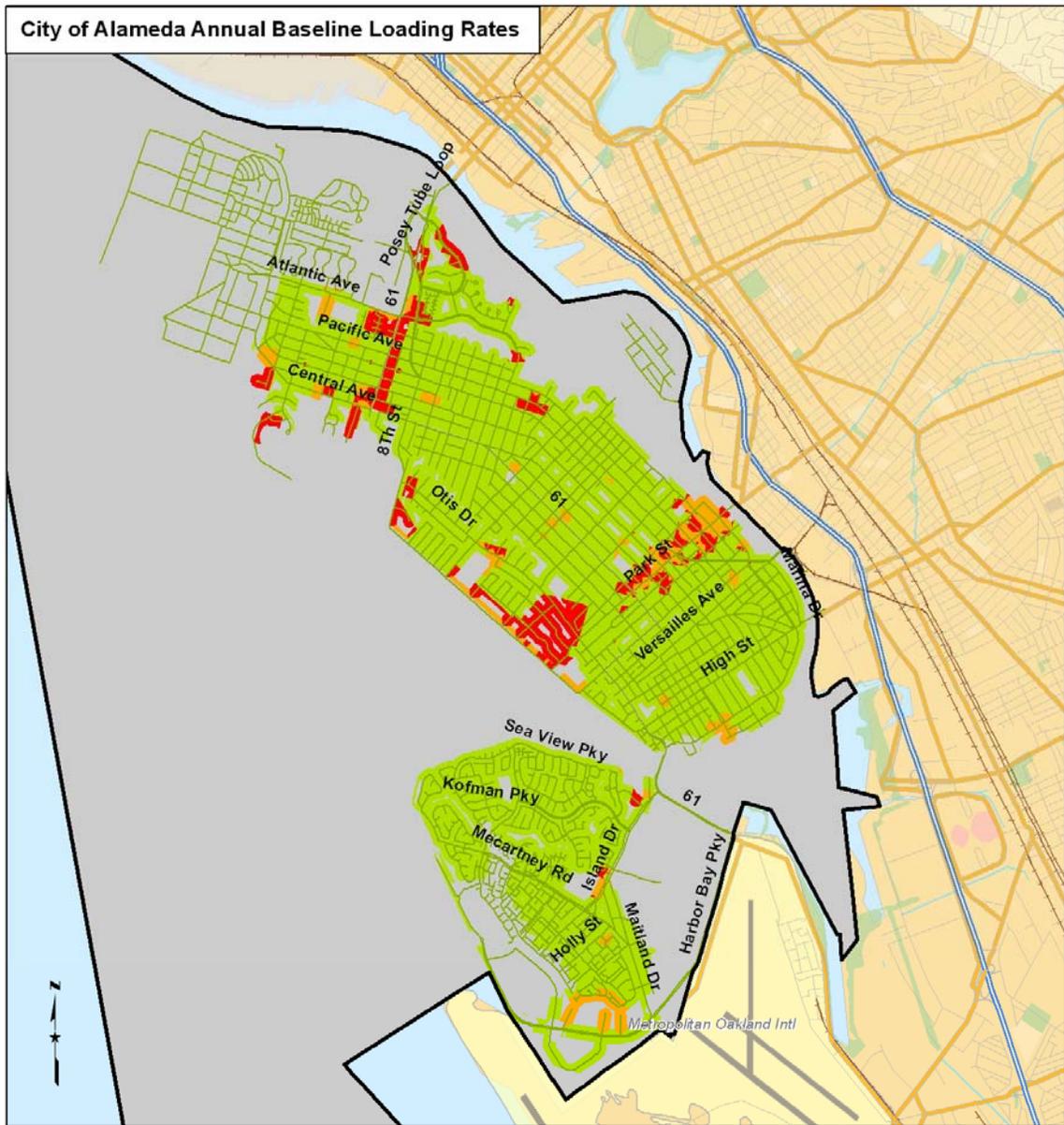
The City of Alameda owns and maintains eight stormwater pump stations. Of these stations, four currently have trash racks that capture trash and allow for removal during maintenance. For the two pump stations with trash racks that had been installed prior to the effective date of the MRP, the estimated volume of trash removed annually from each of those two pump stations 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 Alameda 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 estimated annual trash baseline load for the City of Alameda is presented in Table 2-3, below. Estimated 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: City of Alameda annual trash baseline load.**

<b>Category</b>	<b>Annual Load (gallons)</b>
Preliminary Generation Trash Load	15,769
Load Removed via Baseline Street Sweeping	6,304
Load Removed via Baseline Storm Drain Inlet Maintenance	473
Load Removed via Baseline Stormwater Pump Station Maintenance	119
<b>Trash Baseline Load</b>	<b>8,873</b>



**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 0.5 1 1.5 Miles

**Data Sources:**

Streets: Tele Atlas, 2003. Retrieved from <http://www.arcgis.com/>

City Boundary: County of Alameda

Background: ESRI StreetMap USA

Map Created By: EOA, Inc.

Date: December 15, 2011

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

### 3.0 LOAD REDUCTION CALCULATION PROCESS

Using the guiding principles and assumptions described in BASMAA (2012b), 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 2012b) and is briefly summarized in this section. The process takes into account 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” or “Jurisdiction-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 (“area-wide”). Or, a shoreline trash cleanup can apply a trash load quantification value associated with this control measure against an agency’s entire jurisdictional reduction (“jurisdiction-wide”). 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 street sweeping 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>3</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 #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)
- QF-2: Enhanced Street Sweeping (Area-specific)

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<sup>3</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".

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).

#### **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 or Jurisdiction-wide)
- QF-7: Shoreline Cleanups (Volunteer and/or Municipal) (Jurisdiction-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 CITY OF ALAMEDA ENHANCED TRASH CONTROL MEASURES

This section describes the enhanced trash control measures being implemented or being planned for implementation by the *City of Alameda*. The enhanced control measures described are designed to reach a 40% reduction by July 1, 2014. The new and enhanced control measures that will be implemented by *City of Alameda* and that are discussed further in this section are listed in Table 4.1. Enhanced trash control measure CR-1, Single-use Carryout Plastic Bag Ordinance, is also discussed briefly in this section since this item is currently subject to much public attention and discussion throughout Alameda County

**Table 4.1. City of Alameda Trash Control Measures.**

City of Alameda Enhanced Trash Control Measures
CR-2: Polystyrene Foam Food Service Ware Ordinances
CR-3: Public Education and Outreach Programs
CR-4: Activities to Reduce Trash from Uncovered Loads
CR-6: Improved Trash Bin/Container Management (Municipally or Privately-Controlled)
QF-3: Partial-Capture Treatment Devices
QF-5: Full-Capture Treatment Devices
QF-6: Shoreline Cleanups (Volunteer and/or Municipal)

## **CR-1: Single-use Carryout Plastic Bag Policy**

Single-use plastic carryout bags have been found to contribute substantially to the litter stream and to have adverse effects on marine wildlife (United Nations 2009; CIWMB 2007; County of Los Angeles 2007). The prevalence of litter from plastic bags in the urban environment also compromises the efficiency of systems designed to channel storm water runoff. Furthermore, plastic bag litter leads to increased clean-up costs for the Permittees and other public agencies. The enactment or adoption of policies or ordinances to restrict the availability or use of Single-use Carryout Plastic Bags is considered an enhanced trash control measure.

As of the preparation of this Plan, a single-use bag ban remains under consideration in Alameda County. A second reading of a Single-Use Bag Ban ordinance was approved by the Alameda County Waste Management Authority (ACWMA) in late January 2012. So, this potential enhanced trash control measure is currently subject to much public attention and discussion throughout the County and local municipalities. Neither the citizenry of the City of Alameda nor the City of Alameda City Council have yet had the opportunity to fully vet this recent ACWMA ordinance nor its proposed policies/procedures necessary for implementation. When that public vetting process is completed the City of Alameda will then be able to determine whether this potential enhanced trash control measure will be implemented in the City of Alameda.

No trash load reduction credit for this enhanced trash control measure is currently accounted for in the City of Alameda's Trash Load Reduction Summary Table in Section 5.0 of this Plan. This potential enhanced trash control measure is not discussed further in this Plan.

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

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 calculation of the baseline level of implementation does not consider nor include the control measure.

### Enhanced Level of Implementation

The City of Alameda adopted an ordinance in late 2007 banning polystyrene foam food service ware at the point-of-sale, at City-sponsored events, and on City-owned facilities/properties. The ordinance banning polystyrene foam food service ware became effective and enforceable on July 1, 2008. It prohibits food vendors as well as contractors and vendors doing business with the City from distributing polystyrene foam food service ware. It also bans the use of polystyrene foam food service ware on all City-owned facilities, at City-sponsored events, and on City projects. Additionally, the ordinance requires the use of biodegradable or compostable food service ware.

The following exemptions to the polystyrene foam food service ware ban apply:

- Prepared foods packaged outside the City of Alameda.
- Polystyrene foam coolers and ice chests that are intended for reuse.
- If the City Manager or his/her designee finds that an undue hardship exists.
- No acceptable alternative is available at a commercially reasonable price.
- In a situation deemed by the City Manager to be an emergency.

Referencing relevant language from the BASMAA Load Reduction Tracking Method Technical Report, the City of Alameda implements and enforces both the Tier One and Tier Two enhanced control measures for polystyrene foam food service ware. Those enhance control measure tiers are:

Tier One - Prohibit the distribution of polystyrene foam single-use food and beverage ware at Permittee-sponsored events or on Permittee-owned property – Adoption of a local ordinance or implementation of a statewide, countywide, or regional action that prohibits food vendors from distributing polystyrene foam food and beverage ware at Permittee-sponsored events or on Permittee-owned property.

Tier Two - Prohibit the distribution of polystyrene foam single-use food and beverage ware at all food service vendors - Adoption of a local ordinance or implementation of a statewide, countywide, or regional action that prohibits all food vendors from distributing polystyrene foam food and beverage ware.

## **Percent Reduction from Enhancements**

Consistent with methods presented in the BASMAA (2012b), the City of Alameda will receive an eight (8) percent reduction credit for implementing specific polystyrene foam foodware control measures described in the *Enhanced Level of Implementation* section above. The implementation of the Tier One enhanced control measure is equal to a two percent load reduction credit. And, the implementation of the Tier Two enhanced control measure is equal to a six percent load reduction credit. The total of an eight (8) percent reduction credit will be applied to the City of Alameda's baseline trash load. A summary of all City of Alameda trash load reductions, including this CR-2 value, to be implemented according to this Plan is included in the City of Alameda Trash Load Reduction Summary Table in Section 5.

## 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 Alameda has implemented multiple public education and outreach control measures prior to the effective date of the MRP. These control measures are considered baseline. 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 Alameda 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 Alameda 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.

### **Advertising campaign(s) Countywide Clean Water Program**

Outreach to Alameda County youth may be limited by scope and budget of the BASMAA Regional Youth Campaign. Therefore the Clean Water Program will supplement the Regional Youth Outreach campaign in order to increase the number of participants in Alameda County. The City of Alameda plans to implement this control measure through participation in the Countywide Program.

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

The Countywide Program is currently conducting stormwater pollution prevention and anti-littering outreach to school-age children through contracts with five environmental education organizations. The current contracts expire in 2014. The Program intends to initiate new contracts for outreach to school-age children in 2014. The outreach programs will have an increased focus on anti-littering messages and will be revised to fulfill the required number of events as described in BASMAA (2012b). The City of Alameda plans to implement this control measure through participation in the Countywide Program.

### **Media Relations**

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

Through participation and funding of the **BASMAA Regional Media Relations Project**, the City of Alameda 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.).

#### **Media Relations (Countywide Program)**

Clean Water Program has already developed a media and community relations plan and contact list. The Program will regularly release articles and information to the appropriate publications, blogs and community publications on litter issues. Articles will be timed with regular events, such as Coastal Cleanup in September and the beginning of the rainy season, as well as other current events, if applicable. The media and community outreach list contains many smaller publications and online sites as well as larger newspapers, which will increase the chances the articles are published and read. This effort goes beyond the scope of the Regional Media Relations plan by going deeper into the community through highly localized media channels.

## **Percent Reduction from Enhancements**

Consistent with methods presented in the BASMAA (2012b), the City of Alameda will receive a six (6) percent reduction credit for implementing specific public education and outreach program control measures described in the *Enhanced Level of Implementation* section above. The implementation of the Advertising Campaign enhanced control measure is equal to a three (3) percent load reduction credit. The implementation of the outreach to school-age children/youth enhanced control measure is equal to a two (2) percent load reduction credit. And, the implementation of the Media Relations enhanced control measure is equal to a one (1) percent load reduction credit. The total of a six (6) percent reduction credit will be applied to the City of Alameda's baseline trash load. A summary of all City of Alameda trash load reductions, including this CR-3 value, to be implemented according to this Plan is included in the City of Alameda Trash Load Reduction Summary Table in Section 5.

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

Although it is currently illegal to operate a vehicle that is improperly covered and that contents escape<sup>4</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

Consistent with the standard regional methodology and in order to avoid penalizing early implementers of any applicable control measure to reduce trash from vehicles with uncovered loads, any such 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. The calculation of the City of Alameda's baseline trash load value, as described in Section 2.0, did not consider whether the City of Alameda has adopted control measures to reduce trash from vehicles with uncovered loads. Therefore, the implementation of any of the control measures for the reduction of trash from uncovered loads described in this section is considered to be enhanced implementation.

### Enhanced Level of Implementation

Prior to the adoption of the MRP, the City of Alameda required its franchised waste hauler and permitted construction and demolition (C&D) debris hauler(s) to cover and secure their loads to avoid any materials spilling, leaking or becoming deposited along the public right-of-way. Thus the City of Alameda has been implementing and will continue to implement the following enhanced control measure to reduce trash from vehicles with uncovered loads:

#### Require Municipal Trash Hauler and Permitted Construction Debris Hauler(s) to Cover Loads

The Alameda Municipal Code (AMC) requires that municipal waste haulers and contracted construction debris haulers have cover their loads. AMC Chapter 21, Article 23, Paragraph 4, specifies that all vehicles used for collecting and transporting solid waste, recyclable materials, organic materials and/or construction and demolition debris have to be completely enclosed with a rigid, non-absorbent cover – unless the Public Works Director reasonably determines that a tarp or other non-rigid cover will accomplish the purpose.

Furthermore, the City has included specific contract language in its agreement with Alameda County Industries (ACI) – the City's franchised waste hauler – that all vehicles have to have watertight bodies designed to prevent leakage, spillage, or overflow. Additionally, annual permit application for collecting and hauling of specialty recyclable materials, commercial recyclable materials, commercial organic

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<sup>4</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.

materials, and construction & demolition debris requires the applicant to provide a description of method(s) used to prevent spillage, overflow, outfall, leakage, or other escape of materials from the vehicle(s).

### **Percent Reduction from Enhancements**

Consistent with methods presented in the BASMAA (2012b), the City of Alameda will receive a one percent reduction credit for implementing the specific uncovered trash loads control measure described in the *Enhanced Level of Implementation* section above. The implementation of the requirement for the municipal trash hauler and permitted construction debris hauler(s) to cover loads is equal to a one percent load reduction credit. This one percent reduction credit will be applied to the City of Alameda's baseline trash load. A summary of all City of Alameda trash load reductions, including this CR-4 value, to be implemented according to this Plan is included in the City of Alameda Trash Load Reduction Summary Table in Section 5.

## 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 determination process does not consider the trash load reduction effect of trash bin/container management practices into the baseline load calculation. Therefore, any trash bin/container management practice implemented by Permittees consistent with the BASMAA Load Reduction Tracking Method Technical Report is considered an enhanced trash control measure.

### Enhanced Level of Implementation

The City of Alameda implements the following improved trash bin/container management practices:

#### **(1) Ensuring Adequate Private Trash Service**

Referencing relevant language from the BASMAA Load Reduction Tracking Method Technical Report, the City of Alameda implements and enforces both the Tier One and Tier Two enhanced control measures for ensuring adequate private trash service. The enhanced control measure tiers are described below:

Tier One – Development and Approval of Ordinance for Appropriate Trash Services - The Alameda Municipal Code (AMC) requires that each owner or occupant of a premises in the City has to make arrangements with the City's franchised waste hauler for the collection of solid waste, recyclable materials, and organic materials. Additionally, each owner or occupant is required to contract for a sufficient number of solid waste containers for all waste accumulated between successive collections.

Tier Two – Development and Approval of Ordinance AND Identification and Enforcement of Inadequate Trash Service for Private Trash and Recycling Bins/Containers – The AMC also authorizes the City to initiate collection services at any owner's or occupant's expense, should anyone fail to initiate collection of solid waste, recyclables, and organic materials. The AMC further states that if the Public Works Director determines additional waste, recycling, and/or organics containers are needed, the owner or occupant has 15 days (from the date of the written notice by the Public Works Director) to contract for the requested additional service(s). The City of Alameda's Integrated Solid Waste Program staff with the

City's business partner, ACI, is responsible for identifying and enforcing adequate trash services at all premises in the City of Alameda.

### **(2) Implementation of Strategic Plan for Public Area Trash Containers**

The City currently implements a strategic plan for public area trash containers. The City maintains a list of locations and service frequencies of public area trash containers that are regularly serviced by ACI (franchised waste hauler). Currently, ACI services approximately 200 public area trash containers. The service frequencies of these public area trash containers have been established based on trash generation rates. For example, public area trash containers located in high trash generation areas (i.e., intersection of Park Street and Central Avenue) are serviced 5 times a week whereas public trash containers located in areas that generate less trash get serviced 1 - 3 times a week.

Changes to trash container service frequencies and/or the provision of additional public trash containers results from trash generation observations made by ACI drivers, City Integrated Solid Waste Program staff, or the public. The City of Alameda – through its franchise agreement with ACI - has the option to increase the number of public area trash containers from approximately 200 to 300 containers.

### **(3) Establishment of Business Improvement Districts with Trash Reduction Control Measures**

#### Public Area Trash Container Management in Business Districts

The City of Alameda's franchise agreement with ACI covers maintenance of public area trash containers in the two Business Districts as described below:

- Park Street Business District (Park Street): Public area trash containers are serviced 3 - 5 times/week, depending on trash volume.
- West Alameda Business District (Webster Street): Public area trash containers are serviced Monday, Wednesday, and Friday.

#### Litter/Trash Controls in Business Districts

In addition to the City franchisee's maintenance of the public area trash containers, the City's Maintenance Assessment District Administration Program administers the Island City Landscape & Lighting District, which includes litter/trash controls for the City's two major Business Districts - Park Street and Webster Street. Separate maintenance agreements for Park Street and Webster Street districts are administered by the City's Public Works Department.

Presently, the maintenance agreements include the following services aimed at reducing litter/trash from the two Business Districts:

- Daily litter and trash removal from the public right-of-way including street, gutter, sidewalk, and tree wells as outlined by the respective maintenance contracts, including weekend service dates for a problematic area in the Park Street district.
- Weekly or as needed cleaning of bus stops, corners, steps, and drains.

This has been an on-going maintenance support, and the City of Alameda plans to continue contracting and administering maintenance agreements on behalf of the two Business Districts in the future. Funding for this on-going Business District maintenance support has been assessed through property taxes.

## **Percent Reduction from Enhancements**

Consistent with methods presented in the BASMAA (2012b), the City of Alameda will receive a nine (9) percent reduction credit for implementing specific improved trash bin and container management control measures described in the *Enhanced Level of Implementation* section above. The implementation of the Tier One ordinance for appropriate trash service for private properties is equal to a one (1) percent load reduction credit. The implementation of the Tier Two enforcement of inadequate trash service for private trash and recycling bins enhanced control measure is equal to a two (2) percent load reduction credit. The implementation of a strategic plan for public area trash containers enhanced control measure is equal to a three (3) percent load reduction credit. And, the City's effort to establish trash reduction control measures within business districts results in an additional enhanced trash load reduction credit of three (3) percent. The total of a nine (9) percent reduction credit will be applied to the City of Alameda's baseline trash load. A summary of all City of Alameda trash load reductions, including this CR-6 value to be implemented according to this Plan, is included in the City of Alameda Trash Load Reduction Summary Table in Section 5.

## **QF-3: Partial-Capture Treatment Devices**

Partial-capture devices are treatment devices that have not been approved as full-capture by the San Francisco Bay Regional Water Quality Control Board, but capture trash at a known effectiveness value. Partial-capture devices may be similar to full-capture devices, but do not meet the full capture definition due to engineering challenges; or they may be completely different types of devices. Partial-capture devices include curb inlet screens (e.g., automated retractable screens), litter booms/curtains and stormwater pump station trash racks. Trash loads reduced via partial-capture devices within a Permittee's jurisdictional boundaries may be used to demonstrate attainment of trash load reduction goals.

### **Baseline Level of Implementation**

#### ***Curb Inlet Screens and Litter Booms/Curtains***

The City of Alameda has trialed the use of curb inlet screens but has subsequently removed them due to concerns about local flooding caused by clogged inlet screens. Currently the City of Alameda does not maintain any curb inlet screen installations.

#### ***Stormwater Pump Station Racks***

Prior to effective date of the MRP, the City of Alameda had installed and maintained two stormwater pump station trash racks. Existing pump station trash racks are assumed to remove roughly 25% of the trash that enters the pump station (BASMAA 2012b). The baseline trash load removed via these two devices is accounted for in the City of Alameda's baseline trash loads.

### **Enhanced Level of Implementation**

A total of 2 additional partial-capture treatment devices have been installed in the City of Alameda since the effective dated of the MRP. A list of these partial-capture devices is included in Table QF-4-1. Both of these devices are automated trash racks installed in association with municipal stormwater pump stations and are enhanced trash control measures. Calculation of loads reduced from partial-capture devices was be consistent with the approach described in the *Trash Load Reduction Tracking Method Report* (BASMAA 2012b).

### **Percent Reduction from Enhancements**

The total estimated annual volume of trash that will be reduced by July 1, 2014 as a result of the installation of the partial-capture treatment devices listed in Table QF-4-1 is 83 gallons. This volume is equal to an approximately one percent reduction in the baseline trash load to San Francisco Bay from the City of Alameda's municipal separate storm sewer system (MS4). This trash load reduction value is included in the City of Alameda Trash Load Reduction Summary Table included in Section 5.

**Table QF-3-1. Partial capture treatment devices installed within the City of Alameda prior to July 1, 2014.**

Device ID	Public or Private	Device Name	Location	Installation Completion Date	Total Area Treated (acres)	Trash Load Reduced
Main Street Stormwater Pump Station Trash Rack	Public	Automatic Trash Rack	South side of Main Street, west of intersection of Main Street and Ferry Terminal Road, Alameda, CA, 94501	12/6/11	25	13 gallons
Webster Street Stormwater Pump Station Trash Rack	Public	Automatic Trash Rack	West side of street, 2300-block of Mariner Square Drive, Alameda, CA 94501	12/6/11	131	70 gallons

## 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 2012b). 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. The City of Alameda did not install any full capture devices prior to the effective date of the MRP.

### Enhanced Level of Implementation

As of August 2011, the City of Alameda has installed 4 full trash capture devices (inlet devices) and plans to install additional full trash capture devices prior to July 1, 2014 to treat runoff from an area equivalent to 30% of its commercial district. Based on the on-going evaluation of the inlet devices installed to date, the City will install four additional devices prior to July 1, 2014 to ensure compliance with Provision C.10.a.iii. A list of the installed inlet devices and the additional locations under consideration for full trash capture device installation is included in Table QF-6-1. All inlet devices listed within this table are enhanced trash control measures.

Table QF-6-1 also includes the cumulative area treated and the calculated trash load reduced from the full-capture treatment devices consistent with the approach described in the *Trash Load Reduction Tracking Method Report* (BASMAA 2012b).

### 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 560 gallons. This volume is equal to approximately a 6.3% reduction in the baseline trash load to urban creeks from the municipal separate storm sewer system (MS4) owned and operated by the City of Alameda. Both values provided within this section are included in Trash Load Reduction Summary Table included in Section 5.

**Table QF-5-1: City of Alameda Trash Full-capture treatment devices planned for installation by July 1, 2014.**

Device ID	Public or Private	Device Name	Location (Cross Streets)	Installation Date/Anticipated Installation Date	Total Drainage Area Treated (acres)	Trash Load Reduced (gallons/year)
1 & 2	Public	StormTek Inlet Device	Oak Street at Clinton Avenue – northeast and northwest corners	January 2011	39.5	119
3 & 4	Public	StormTek Inlet Device	Oak Street at Buena Vista Avenue – southeast and southwest corners	August 2011	23.9	174
5 & 6	Public	Inlet Device (specific device to be determined)	Everett Street at Eagle Avenue – southeast and southwest corners	To be determined	32.1	210
7 & 8	Public	Inlet Device (specific device to be determined)	Park Avenue at Otis Drive – northeast and northwest corners	To be determined	30.6	57
TOTALS:					126.1	560

## **QF-6: Shoreline Cleanups**

Creek, channel and shoreline cleanups have been successful in removing large amounts of trash from San Francisco Bay area creeks and waterways as well as successful 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 due to shoreline cleanup efforts was not accounted for in the calculation of the City of Alameda's preliminary baseline trash load described in Section 2.0. Therefore, implementation of shoreline cleanup control measures described in this section is considered to be an enhanced trash load reduction control measure and can be used to demonstrate progress towards trash load reduction goals.

### **Enhanced Level of Implementation**

Since the effective date of the MRP, the City of Alameda has conducted two annual rounds of Provision C.10.b Trash Hot Spot Cleanups at four (4) separate Trash Hot Spots, tracking total volumes of trash debris and recyclables removed from each site. Consistent with the MRP requirements the City of Alameda plans to continue its shoreline Trash Hot Spot Cleanup program. These cleanups will continue to be conducted on an annual basis at each Trash Hot Spot site and the volume of debris and trash removed will be tracked to demonstrate trash loads reduced.

### **Percent Reduction from Enhancements**

The volume of trash and debris removed to-date from the City's shoreline Trash Hot Spot sites includes historically accumulated trash and debris. The current to-date annual average of 13.3 cubic yards of debris removed per Trash Hot Spot may overestimate the long-term annual trash-removal average. Continued annual trash removal and removed-volume data collection will result in improved estimates of average annual trash load removals from each Trash Hot Spot site. At present, the conservative assumption of an average of one cubic yard of trash removed annually from each Trash Hot Spot site (one cubic yard assumed to equal 175 gallons) would result in a total estimated annual volume of trash removed at the City's four Trash Hot Spot sites of 700 gallons. This volume is equal to approximately a 7.8 percent reduction in the baseline trash load from the City of Alameda's municipal separate storm sewer system. These values are included in the Trash Load Reduction Summary Table included in Section 5.

## **5.0 SUMMARY OF CITY OF ALAMEDA TRASH LOAD CONTROL MEASURES**

The City of Alameda is committed to reducing the potential for trash impacts in local water bodies in the San Francisco Bay Area. As discussed in Section 2, the City of Alameda's Preliminary Trash Baseline Load, is 8,873 gallons per year. The City of Alameda's trash load reduction control measures, discussed in detail in Section 4, are summarized in cumulative fashion in Table 5-1 below.

Reductions are generally applied sequentially, as presented in Figure 2-1 and described in Section 3. For example, the Trash Load Reduction value calculated for Existing Enhanced Street Sweeping is subtracted from the Trash Baseline Load prior to applying the reduction credits for other trash control measures. Consistent with the regional BASMAA methodology (BASMAA (2012b)), the control measure reduction credits are then also applied to the Trash Baseline Load so that the cumulative reduction percentage is also in direct relation to the Baseline Load value.

The implementation of these City of Alameda trash control measures and this Plan indicates that the City of Alameda will decrease its Baseline Trash Load by 48.1% by July 1, 2014, in compliance with the 40% trash load reduction goal in MRP provision C.10.

Table 5-1. City of Alameda Trash Load Reduction Summary Table.

Trash Control Measure	Summary Description of Control Measure	% Reduction (Credits)	Trash Load Reduced (gallons)	Cumulative % Reduction (Compared to Baseline)
Existing Enhanced Street Sweeping	Street Seeping activities currently implemented above Baseline Ceiling	11.8%	1,051	11.8%
Polystyrene Foam Food Service Ware Ban (CR-2)	Implementation and Enforcement of City of Alameda’s Polystyrene Ban	8.0%	626	18.9%
Public Education and Outreach Programs (CR-3)	On-going local and regional Advertising Campaigns, Media Relations and Outreach to Schools	6.0%	469	24.2%
Activities to Reduce Trash from Uncovered Loads (CR-4)	Implementation of City of Alameda’s Covered Trash Load Ordinance	1.0%	78	25.1%
Improved Trash Bin/Container Management (Municipally or Privately-Controlled) (CR-6)	Implementation and Enforcement of City of Alameda’s mandatory Solid Waste Services Ordinance	9.0%	705	33.0%
Enhanced Pump Station Trash Rack Cleaning (Partial-capture Treatment Device) (QF-3b)	On-going maintenance of recently installed Pump Station Trash Racks	NA	83	34.0%
Full-capture Treatment Devices (QF-5)	Installation and on-going maintenance of Provision C.10.a Full Trash Capture Devices	NA	560	40.3%
Shoreline Cleanups (Volunteer and/or Municipal) (QF-6)	Implementation of Provision C.10.b Trash Hot Spot Cleanup program	NA	700	48.1%

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

Consistent with MRP Provision C.10.d (i), the City of Alameda 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 of progress towards trash load reduction goals.

Similar to other MRP provisions, annual reporting formats will be consistent region-wide. Annual reports are intended to provide a summary of control measure implementation toward MRP trash reduction goals. For more detailed information on specific control measures, the City of Alameda 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 2012b).

## 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 Alameda is occurring consistent with MRP requirements. A preliminary implementation schedule for all planned enhancements is described in Table 6-1. This schedule provides a timeframe for reducing trash discharged from the City of Alameda's MS4 by 40% by July 1, 2014.

The City of Alameda may amend or revise this Plan if necessary to document on-going compliance with the MRP based either on new information that becomes available during the on-going implementation of the Project and/or this Plan (e.g., revisions to baseline loading estimates, load reduction credits or quantification formulas OR revisions to City of Alameda trash load reduction activities, etc.) or if circumstances arise during the implementation of the Plan that were not anticipated at the time of submission. If revisions or amendments occur, a revised Short-Term Plan and implementation schedule will be submitted to the Water Board via the City of Alameda's annual reporting process.

Table 6-1: Short-Term Plan implementation schedule for enhanced trash control measures in the City of Alameda.

Trash Control Measure	Beginning Date of Implementation
Single-use Carryout Plastic Bag Ordinance (CR-1)	Not currently applicable
Polystyrene Foam Food Service Ware Ban (CR-2)	July 1, 2008
Public Education and Outreach Programs (CR-3)	December 1, 2009
Activities to Reduce Trash from Uncovered Loads (CR-4)	(City Ordinance adopted prior to) December 1, 2009
Improved Trash Bin/Container Management (Municipally or Privately-Controlled) (CR-6)	(City Ordinance adopted prior to) December 1, 2009
Full-capture Treatment Devices (QF-5)	February 14, 2011 (partial); July 1, 2014 (complete)
Enhanced Pump Station Trash Rack Cleaning (Partial-capture Treatment Device) (QF-3b)	December 6, 2011
Shoreline Cleanups (Volunteer and/or Municipal) (QF-6)	July 1, 2010

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