

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

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**Submitted by:**

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

**January 23, 2012**

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**CITY OF SANTA CLARA  
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:**



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Dave Staub  
Acting Assistant Director of Streets &  
Automotive Services

1/23/12

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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 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 Santa Clara 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 Santa Clara'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 Santa Clara 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 2012a).

## 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 Santa Clara 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 Santa Clara’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

In compliance with Provision C.10.a.ii of the MRP, City of Santa Clara worked collaboratively with other MRP Permittees through BASMAA to develop data and the process necessary to establish baseline trash loading estimates to MS4s. The collaborative project was managed through the BASMAA Trash Committee and included a series of steps described in BASMAA (2012) and listed below. The approach was intended to be cost-effective and consistent, but still provide an adequate level of confidence in trash loads from municipal separate storm sewer systems (MS4s), while acknowledging that uncertainty in trash loads still exists.

- Step #1:** Conduct literature review
- Step #2:** Develop conceptual model
- Step #3:** Develop and implement sampling and analysis plan
- Step #4:** Test conceptual model
- Step #5:** Develop default trash generation rates
- Step #6:** Develop trash baseline loading rates by adjusting trash generation rates based on existing levels of control measure implementation
- Step #7:** Apply trash baseline loading rates and calculate baseline load

Through the collaborative BASMAA project, default baseline trash generation rates (volume per area) for wet and dry seasons 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 applicable jurisdictional areas within the City of Santa Clara. Trash generation rates were then adjusted based on baseline street sweeping and storm drain inlet maintenance conducted in each applicable area. The sum of the trash loads (i.e., rate multiplied by area) from each jurisdictional area represents the City of Santa Clara's baseline trash load from its MS4. A full description of the methods by which trash baseline loads were developed is included in BASMAA

This section provides a summary of land use characteristics and demographics in the City of Santa Clara's that, based on the results of the BASMAA *Trash Generation Rates Project*, appear to affect trash generation rates. The process by which the City of Santa Clara's trash baseline loading estimate was developed is also more fully described below.

### Default Trash Generation Rates (Regional Approach)

A set of default trash generation rates for wet and dry seasons were 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 (Fall/Winter 2011), this section of the Plan will 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 Trash Generation Rates.**

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

### Permittee Characteristics

Incorporated in 1852, the City of Santa Clara is located in Santa Clara County, and has a jurisdictional area of 11,628 acres. According to the 2010 Census, it has a population of 116,468, with a population density of 6,327.3 people per square mile, and average household size of 3.18. Of the 116,468 who call the City of Santa Clara home, 21.3% are under the age of 18, 10.7% are between 18 and 24, 36.0% are between 25 and 44, 22.0% are between 45 and 64, and 10% are 65 or older.

Companies such as Intel, Applied Materials, Sun Microsystems, NVIDIA, Agilent Technologies, and Westfield Valley Fair Mall are located in the City of Santa Clara. The median household income was \$69,466 in 2000<sup>1</sup>.

### Land Use

Default trash baseline generation rates presented in Table 2-1 were applied to effective loading areas with jurisdictional areas within the City of Santa Clara. The City of Santa Clara’s jurisdictional areas includes all urban land areas within the City of Santa Clara 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 Clara County;
- Colleges and Universities (Private or Public);
- 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).

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

Once the City of Santa Clara'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 Santa Clara are presented in Table 2-

**Table 2-2: Jurisdictional areas and effective loading areas in the City of Santa Clara 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	1,767	1,537	20
Low Density Residential	3,277	3,152	41
Rural Residential	61	51	1
Commercial and Services/ Heavy, Light and Other Industrial	3,712	1,981	26
Retail and Wholesale	767	569	7
K-12 Schools	414	235	3
Urban Parks	272	156	2
<b>TOTAL</b>	<b>11,628</b>	<b>7,680</b>	<b>100%</b>

Regional default trash generation rates developed through the BASMAA regional collaborative project were applied to effective loading areas within the City of Santa Clara 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 Santa Clara 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 Santa Clara 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 Santa Clara's baseline street sweeping program includes sweeping industrial, commercial and residential areas twice per month, and sweeping retail areas once per week. Parking enforcement signs

are not posted in 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 Santa Clara, 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 Santa Clara has an annual effectiveness rating of 5%. The estimated trash load reduced via baseline street sweeping is presented in Table 2-3.

**Baseline Stormwater Pump Station Maintenance**

The City of Santa Clara owns and maintains 21 stormwater pump stations. Of these stations, 11 have trash racks that capture trash and allow for removal during maintenance. For those pump stations with trash racks, the estimated volume of trash removed annually from each pump station 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 Santa Clara 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 Santa Clara is presented in Table 2-3. Preliminary baseline trash loading rates are presented in Figure 2-1 to provide a geographical illustration of areas with estimated low, moderate, high and very high trash loading rates.

**Table 2-3: Preliminary annual trash baseline load for the City of Santa Clara.**

Category	Annual Load (gallons)
Preliminary Generation Trash Load	64,636
Load Removed via Baseline Street Sweeping	22,038
Load Removed via Baseline Storm Drain Inlet Maintenance	2,130
Load Removed via Baseline Stormwater Pump Station Maintenance	2,109
<b>Preliminary Trash Baseline Load</b>	<b>38,359</b>

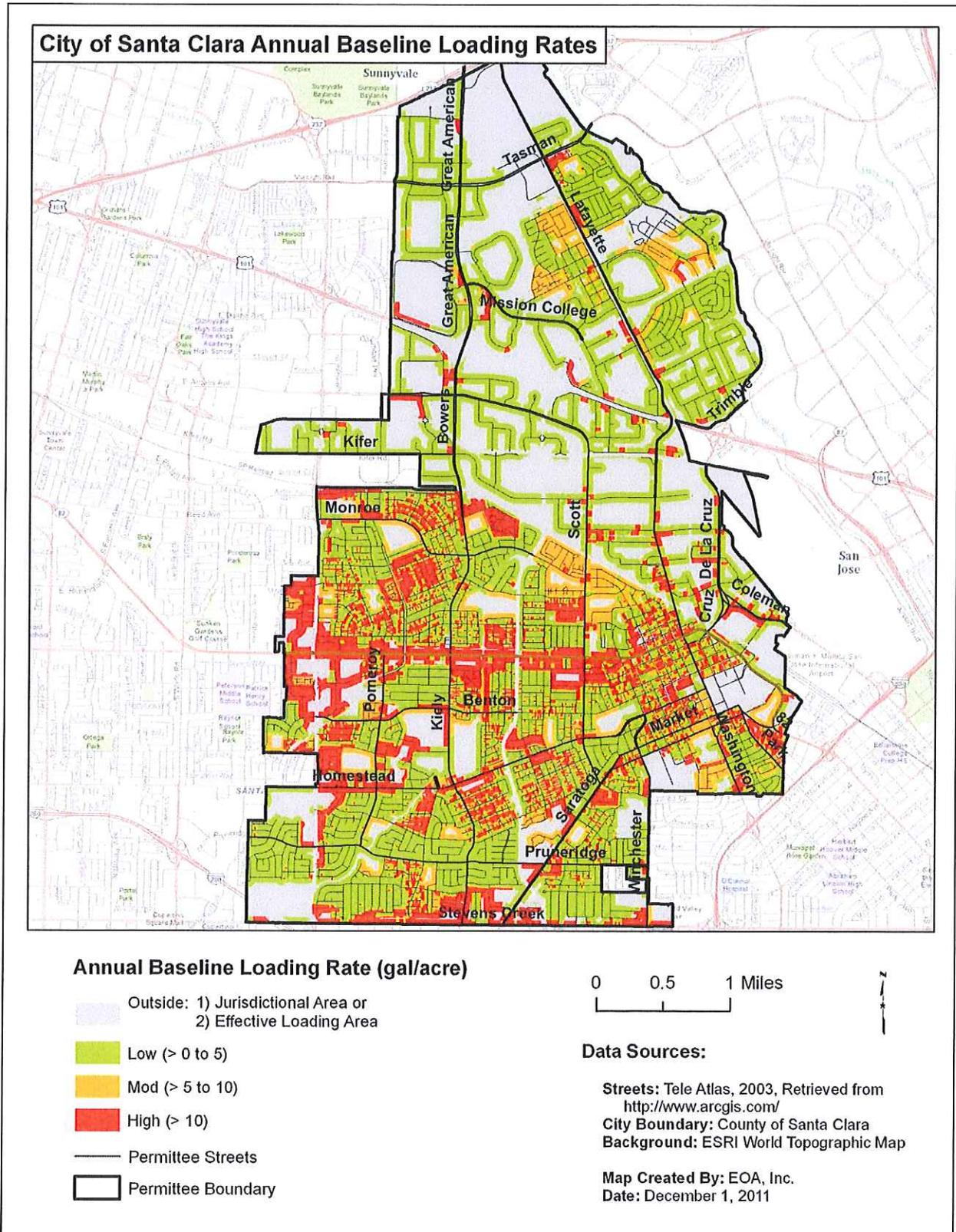


Figure 2-1: Estimated trash baseline loading rates for geographical areas in the City of Santa Clara.

### 3.0 LOAD REDUCTION CALCULATION PROCESS

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

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

#### **Step #1: Existing Enhanced Street Sweeping**

Trash load reductions due to existing enhanced street sweeping implemented prior to the effective date of the MRP and conducted at levels above baseline levels are not incorporated into each Permittee’s trash baseline load. Therefore, load reductions associated with existing enhanced 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-6)
- 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 #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)

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).

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<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-7: Creek/Channel/Shoreline Cleanups (Volunteer and/or Municipal) (Area-wide)

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

## Step #6: Comparison to Baseline Trash Load

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

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

## 4.0 ENHANCED TRASH CONTROL MEASURES

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

**Table 4.1. Trash control measures that will be implemented by the City of Santa Clara to reach the 40% trash load reduction.**

Control Measure
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 (Municipally or Privately-Controlled)
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)

## 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 Santa Clara implemented the following public education and outreach control measures prior to the effective date of the MRP. The City of Santa Clara currently hosts a booth to educate students about urban runoff pollution prevention at its annual Arbor Day festival. Staff also conducts presentations to classrooms using the Enviroscape interactive education tool. The City of Santa Clara uses its quarterly newspaper, Inside Santa Clara, its website, and its cable channel to promote awareness of urban runoff pollution prevention and encourage audiences to take appropriate actions to minimize it. These control measures are considered baseline because they were either not related to trash reduction specifically, nor are they 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 Santa Clara 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 Santa Clara 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 run from FY 11-12 through FY 13-14 at least. 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.

#### ***Watershed Watch Campaign (Countywide)***

In addition to the BASMAA Campaign, the City of Santa Clara will continue to implement the countywide **Watershed Watch Campaign** through active participation and funding of the Santa Clara Valley Urban Runoff Pollution Prevention Program (SCVURPPP). This Campaign conducts media advertising that includes anti-litter messages. Anti-litter advertisements for television, print, transit and radio have been developed and are used each year and will continue in the future. A telephone survey is conducted every five years to measure the effectiveness of outreach and increase in awareness about litter and stormwater related messaging.

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

##### ***ZunZun (Countywide)***

Through participation and funding of the SCVURPPP countywide ZunZun Program, the City of Santa Clara plans to continue to implement litter reduction outreach to elementary school-age children. Up to 50 ZunZun assemblies at elementary schools are conducted in the Santa Clara Valley each year. These bilingual musical assemblies educate elementary school students and their teachers on watersheds and urban runoff pollution prevention, including litter. ZunZun performances use physical comedy, audience participation and musical instruments to educate teachers and children. Handouts, including teacher and student activity sheets, are distributed following the assembly.

The SCVURPPP Schools and Youth Education and Outreach Work Group provides a list of schools for ZunZun to contact. In addition to schools with high Hispanic populations, the list includes schools with high Asian/Pacific Islander populations.

ZunZun assemblies are evaluated using postage-paid evaluation cards that are distributed to all teachers present at the performances. Teachers mail the completed evaluation cards to SCVURPPP, and results are compiled by SCVURPPP staff. Based on the teacher feedback, changes are made to future assemblies and/or handouts.

## **Media Relations**

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

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

## **Percent Reduction from Enhancements**

The City of Santa Clara will receive a total of six 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 - 0%

These 6% reduction credits will be applied against the City of Santa Clara'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 by which improper coverage its' contents escape<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 Santa Clara 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 Santa Clara will develop and include language in future solid waste collection service agreements that requires contracted solid waste collection companies to cover loads when transporting trash and debris to solid waste facilities. This language will be implemented in the next round of non-exclusive franchise agreements that will have an effective date of July 1, 2013. The City currently has non-exclusive franchise agreements with ten (10) solid waste collection companies.

### Percent Reduction from Enhancements

The City of Santa Clara will receive a 1% reduction credit for implementing specific enhanced control measures described in *Description of Enhanced Level of Implementation* section above. The 1% 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 Santa Clara. 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.

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<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 Santa Clara 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 Santa Clara currently issues citations to littering/illegal dumping offenders caught in the act.

### **Enhanced Level of Implementation**

The City of Santa Clara will implement enhanced anti-littering and illegal dumping enforcement control measures prior to July 1, 2014. The City has a current dial-a-tip hotline to report graffiti vandalism. The City will encourage callers to report illegal dumping activities on the hotline, as well. The City of Santa Clara will investigate the complaints to collect evidence to determine the responsible party and issue citations as applicable.

### **Percent Reduction from Enhancements**

The City of Santa Clara will receive a two percent reduction credit for implementing specific enhanced control measures described in *Description of Enhanced Level of Implementation* section above. The 2% 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 Santa Clara. 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 Santa Clara has not implemented enhanced trash bin/container management practices prior to effective date of the MRP. Prior to December 1, 2009, the City of Santa Clara provided single-family home residents with 18-gallon open top containers to store rigid recyclable materials and residents placed mixed paper in open top paper bags for collection. The wind blowing lighter weight recyclables out of the open top containers was a problem associated with this collection system. The City of Santa Clara has developed solid waste enclosure guidelines, but does not have an ordinance that requires sufficient space for both recycling and garbage containers.

### Enhanced Level of Implementation

The City of Santa Clara will implement improved solid waste container management practices by July 1, 2014. On December 7, 2009, the City of Santa Clara implemented a single-stream recycling program in which single-family residents were provided with a lidded cart for storage of recyclable materials, so the wind cannot blow recyclables out of the container if the lid is closed. The City of Santa Clara will adopt a mandatory recycling ordinance that mirrors the requirements set for in Assembly Bill 341 and mandates that all properties be designed with enclosures or sufficient space to adequately store both garbage and recycling containers. The City of Santa Clara will use Street Department staff to respond to complaints from the public and solid waste collection company personnel regarding overflowing containers. City Staff will have ability as applicable to issue notices of violation, citations, and to increase customers' garbage service to necessary levels to sufficiently contain all solid waste generated. The City of Santa Clara will install and maintain additional garbage and recycling containers at public properties that generate large amounts of trash. City Staff will check containers on a regular basis (daily to weekly depending on need). A strategic plan for public area trash containers will be developed and implemented by July 1, 2014.

### **Percent Reduction from Enhancements**

The City of Santa Clara will receive a 6% reduction credit for implementing specific enhanced control measures described in *Description of Enhanced Level of Implementation* section above. The 6% 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 Santa Clara. 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-1: Enhanced On-Land Trash Cleanups (Volunteers and/or Municipal)

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

### Baseline Level of Implementation

The City of Santa Clara implemented the following on-land cleanup activities prior to the effective date of the MRP. Parks Department staff collects litter and trash from Public Parks. The Street Department responds to and abates illegal dumping complaints on public property. The Police Department coordinates with the Street Department to clean homeless encampments as necessary. These control measures are considered baseline because they were accounted for in the preliminary trash generation rates established through the BASMAA *Baseline Trash Generation Rates Project*. New or enhanced actions that began or are planned to begin after to the effective date of the MRP are described under the next section.

### Enhanced Level of Implementation

Prior to July 1, 2014, the City of Santa Clara will conduct enhanced on-land trash cleanup activities. The Parkways and Boulevards Division of the Street Department will manually remove trash from center median islands and parkway strips on weekly basis. The volume of trash removed will be tracked on employee daily timecards and tabulated into a monthly activity report that will be use to track the amount of trash loads reduced.

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

### Percent Reduction from Enhancements

The total estimated annual volume of trash that will be reduced beginning July 1, 2014 as a result of implementing on-land trash cleanups is 1,873 gallons. This volume is equal to approximately a 4.9% reduction in the baseline trash load to urban creeks from the municipal separate storm sewer system (MS4) owned and operated by the City of Santa Clara. Both values provided within this section are included in 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 Santa Clara's baseline street sweeping program includes sweeping industrial, commercial and residential areas twice per month, and sweeping retail areas once per week. Parking enforcement signs are not posted in the City.

### Enhanced Level of Implementation

The City of Santa Clara's existing enhanced street sweeping program includes sweeping at a frequency above the baseline ceiling described in Section 2.0. Specifically, the City sweeps residential areas three times per month on average. All street sweeping is performed by City employed personnel. The City has three full-time street sweeper operators.

Although residential street sweeping routes are scheduled to be swept on a weekly basis, residential routes are not always completed at this frequency due to limited staffing to cover employee vacations and sick days. Residential street sweeping routes include frontages in front of most K-12 schools and public parks. Each street sweeper operator maintains eight (8) industrial routes, which include retail and commercial property frontages. The street sweeper operators complete one industrial route each workshift, which equates to sweeping approximately twice per month.

The total estimated annual volume of trash that is already reduced due to existing enhanced street sweeping is 2,341 gallons. This volume is equal to approximately a 6.1% reduction in the baseline trash load to urban creeks from the municipal separate storm sewer system (MS4) owned and operated by the City of Santa Clara. Both values provided within this section are included in Trash Load Reduction Summary Table included in Section 5.0.

The City of Santa Clara is currently sweeping residential routes, which comprise about 50% of the City's land-use area three times per month, as compared to the baseline of two times per month. The retail areas, which comprise less than 7% of the City's land-use are swept twice per month, as compared to the baseline of weekly sweeping. The rest of the commercial/industrial routes are swept twice per month, which is in line with the baseline for sweeping in those land-use areas.

The City of Santa Clara plans to enhance its street sweeping program significantly prior to July 1, 2013. The City of Santa Clara will increase the frequency that industrial routes (including retail areas) are swept. Industrial street sweeping routes will be swept three times per month. The City of Santa Clara will also implement a parking enforcement program prior to July 1, 2013. The parking enforcement program will include posting streets for "No Parking" between designated hours on certain days of the week for street sweeping. The Police Department will be advised of areas with parking controls so applicable citations can be issued for violations. The City of Santa Clara has not selected specific routes

Enhancements to street sweeping frequencies and parking enforcement (or equivalent measures) control measures will be used to calculate loads reduced from enhanced street sweeping, consistent with the trash load reduction tracking method (BASMAA 2012a).

The City of Santa Clara will analyze industrial sweeping routes to determine which streets are the most prone to trash, and have problems with vehicles parked on the street during sweeping events. The decision of which streets to enact parking enforcement controls on will be made after the completion of this analysis. The City of Santa Clara will reduce 3,597 gallons of trash reaching the MS4 by implementing future enhancements, which translates into a seven and 9.3% reduction.

### **Percent Reduction from Enhancements**

The total estimated annual volume of trash that will be reduced by July 1, 2014 as a result of enhanced street sweeping is 5,938 gallons. As described in Trash Load Reduction Summary Table included in Section 4, this volume is equal to approximately a 15.4 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 Santa Clara.

## 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 track 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*

Prior to effective date of the MRP, some Permittees within the Bay area have installed and maintained curb inlet screens and litter booms/curtains. To avoid penalizing these early implementers, the 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. Furthermore, the trash load removed via these devices installed prior to the MRP is not accounted for in baseline trash loads. Therefore, the baseline level of implementation is not applicable for this control measure, as devices installed prior to the effective date of the MRP and associated loads reduced will be grandfathered in as enhanced measures.

#### *Stormwater Pump Station Racks*

Similar to the devices described above, some Permittees within the Bay area have installed and maintained trash racks on their stormwater pump stations. Existing pump station trash racks are assumed to remove roughly 25% of the trash that enters the pump station (BASMAA 2012a). The baseline trash load removed via these devices is accounted for in baseline trash loads.

The City of Santa Clara cleans its stormwater pump station wetwells once a year as part of its dry season maintenance program. In addition, the City of Santa Clara cleans the trash racks at each pump station following every storm event as part of the routine maintenance program.

### Enhanced Level of Implementation

A total of 86 partial-capture treatment devices have been or will be installed in the City of Santa Clara prior to July 1, 2014. A list of these partial-capture devices is included in Table QF-3-1. All devices listed within the table are enhanced trash control measures. Calculation of loads reduced from partial-capture devices will be 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 partial-capture treatment devices listed in Table QF-3-1 is 873 gallons. This volume is equal to approximately a 2.3% reduction in the baseline trash load to urban creeks from the municipal

separate storm sewer system (MS4) owned and operated by the City of Santa Clara. Both values provided within this section are included in Trash Load Reduction Summary Table included in Section 5.0.



## **QF-4: Enhanced Storm Drain Inlet Maintenance**

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

### **Baseline Level of Implementation**

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

### **Enhanced Level of Implementation**

A total of 3,700 storm drain inlets will be maintained in the City of Santa Clara at higher frequencies prior to July 1, 2014. The City of Santa Clara will clean storm drain inlets at least twice per year on average. The enhanced frequency of maintenance and associated effectiveness ratings will be used to calculate loads reduced from enhanced maintenance. This load reduction calculation method is consistent with the trash load reduction tracking method (BASMAA 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 enhanced storm drain inlet maintenance is 273 gallons. This volume is equal to approximately a 0.7% reduction in the baseline trash load to urban creeks from the municipal separate storm sewer system (MS4) owned and operated by the City of Santa Clara. Both values provided within this section are included in Trash Load Reduction Summary Table included in Section 5.0.

## 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 two trash full-capture treatment devices have been or will be installed in the City of Santa Clara 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 869 gallons. This volume is equal to approximately a 2.3% reduction in the baseline trash load to urban creeks from the municipal separate storm sewer system (MS4) owned and operated by the City of Santa Clara. Both values provided within this section are included in Trash Load Reduction Summary Table included in Section 5.0.

Table QF-5-1. Trash full-capture treatment devices within the jurisdictional boundaries of the City of Santa Clara that are planned for installation by July 1, 2014.

Device ID	Public or Private	Device Name	Location (Cross Streets)	Installation Date/Anticipated Installation Date	Total Area Treated (acres)	Trash Load Reduced
FCT-2HF	Public	Fresh Creek Technologies, Inc. End of Pipe Netting Trash Trap (2 netting systems)	Westside Stormwater Retention Basin at 2900 Old Mountain View Alviso Road (cross street of Great America Parkway)	June 2012	825 acres	869 gallons (2.2%)

## 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 Santa Clara'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 Santa Clara 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. The City of Santa Clara will clean five trash hotspots during the Coastal Clean-Up event each September and remove homeless encampments on an as-needed basis.

### 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 125 gallons. This volume is equal to approximately 0.3% reduction in the baseline trash load to urban creeks from the municipal separate storm sewer system (MS4) owned and operated by the City of Santa Clara. Both values provided within this section are included in Trash Load Reduction Summary Table included in Section 5.0.

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<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 Santa Clara 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 Santa Clara plans to implement multiple control measures to achieve the 40% trash load reduction goal. The City of Santa Clara will enact the following trash control measures which are covered in the Credits (CR) section of this plan: conduct public education and outreach programs targeted at reducing trash; include language requiring loads to be covered in non-exclusive franchise agreements; include littering/illegal dumping with the graffiti hotline and conduct investigations and enforcement actions as applicable; provide residents with carts with lids instead of open top containers, require solid waste enclosures to be designed to adequately store containers, and implement an enforcement program to ensure that solid waste customers have adequately sized containers.

In addition, the City of Santa Clara will implement trash control measures that are covered in the Quantifications (QR) section of this plan. These measures include: cleaning trash from traffic medians and islands on a weekly basis; cleaning industrial street sweeping routes more frequently and implement parking enforcement in certain areas on sweeping days; installing partial capture faceplates on inlets with significant amounts of trash; cleaning all storm drain inlets twice per year; installing full trash capture netting systems at the Westside storm retention basin; and participating in the annual coastal clean-up day.

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

Trash Control Measure	Summary Description of Control Measure	% Reduction (Credits)	Trash Load Reduced	Cumulative % Reduction (Compared to Baseline)
Existing Enhanced Street Sweeping	Continue existing enhanced street sweeping activity above baseline	6.1	2341	6.1
Public Education and Outreach Programs (CR-3)	Conduct public education and outreach programs targeted at reducing trash/litter	6.0	2162	11.7
Activities to Reduce Trash from Uncovered Loads (CR-4)	Include language requiring solid waste loads to be covered in non-exclusive franchise agreements	1.0	360	12.7
Anti-Littering and Illegal Dumping Enforcement Activities (CR-5)	Include litter/illegal dumping with the graffiti hotline and conduct investigations and enforcement actions as applicable	2.0	721	14.6
Improved Trash Bin/Container Management (Municipally or Privately-Controlled) (CR-6)	Provide residents with recycling carts with lids instead of open top containers, require solid waste enclosures to be designed to adequately store containers, and implement an enforcement program to ensure that solid waste customers have adequately sized containers.	6.0	2162	20.2
Enhanced On-land Trash Cleanups (Volunteer and/or Municipal) (QF-1)	Clean trash from traffic medians and islands on a weekly basis	NA	1873	25.1

Enhanced Street Sweeping (QF-2) – (To be implemented at a future date)	Implement a parking enforcement program and increase sweeping frequencies in commercial/industrial/retail land uses	NA	2886	34.4
Curb Inlet Screens (Partial-capture Treatment Device) (QF-3a)	Install partial trash capture devices (curb inlet screens) on inlets with significant amounts of trash	NA	873	36.7
Enhanced Storm Drain Inlet Maintenance (QF-4)	Increase inlet cleaning to two times per year	NA	273	37.4
Full-capture Treatment Devices (QF-5)	Install two Fresh Creek Technologies end of pipe netting systems at Westside Storm Retention Basin	NA	869	39.7
Creek/Channel/Shoreline Cleanups (Volunteer and/or Municipal) (QF-6)	Participate in the annual Coastal Clean-Up Day	NA	125	40.0

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

Consistent with MRP Provision C.10.d (i), the City of Santa Clara 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 Santa Clara 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 Santa Clara 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 Santa Clara'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 Santa Clara 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 Santa Clara's annual reporting process.

Table 5-1. Preliminary implementation schedule for enhanced trash control measures in the City of Santa Clara

Trash Control Measure	Beginning Date of Implementation
Public Education and Outreach Programs (CR-3)	Implemented
Activities to Reduce Trash from Uncovered Loads (CR-4)	July 1, 2013
Anti-Littering and Illegal Dumping Enforcement Activities (CR-5)	July 1, 2013
Improved Trash Bin/Container Management (Municipally or Privately-Controlled) (CR-6)	Partially Implemented / Complete by July 1, 2013
On-land Trash Cleanups (Volunteer and/or Municipal) (QF-1)	Implemented
Future Enhanced Street Sweeping (QF-2)	July 1, 2013
Curb Inlet Screens (Partial-capture Treatment Device) (QF-3a)	Partially Implemented / Complete by July 1, 2013
Enhanced Storm Drain Inlet Maintenance (QF-4)	Implemented
Full-capture Treatment Devices (QF-5)	October 31, 2012
Creek/Channel/Shoreline Cleanups (Volunteer and/or Municipal) (QF-6)	Implemented

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