Staff Report:

Reconsideration of Certain Technical Matters of the Trash TMDLs for the Los Angeles River Watershed and the Ballona Creek Watershed

Los Angeles Regional Water Quality Control Board

April 2015

Table of Contents

Tables:

Figures:

Attachments:

1 Trash in the Los Angeles River and Ballona Creek Watersheds

This staff report presents analyses and rationale in support of recommendations to reconsider certain technical aspects of two trash total maximum daily loads (TMDLs) in the Los Angeles Region – the Los Angeles River Watershed Trash TMDL ("Los Angeles River Trash TMDL") and the Ballona Creek Trash TMDL ("Ballona Creek Trash TMDL"). No significant changes are proposed to the principal existing technical TMDL elements that were established in the original TMDLs, including problem statements, numeric targets, source and linkage analyses, waste load allocations (WLAs) and load allocations (LA), margins of safety, and critical conditions in either the Los Angeles River or Ballona Creek Trash TMDLs. Neither are there significant changes proposed to the overarching compliance options – full capture, partial capture, and institutional controls – identified in the Los Angeles River and Ballona Creek Trash TMDLs. The proposed changes are intended to ensure consistency between the two TMDLs where appropriate; provide clarity regarding compliance demonstration as responsible agencies approach final deadlines; provide greater specificity regarding implementation of load allocations; and improve compliance monitoring and ensure receiving water monitoring.

Section VI.A of the August 9, 2007 Los Angeles River Watershed Trash TMDL Staff Report (LARWQCB, 2007b) and the corresponding 2007 Basin Plan Amendment (LARWQCB, 2007a) established that the Los Angeles Regional Water Quality Control Board (Regional Board) would review and reconsider the final WLAs once a reduction of 50% has been achieved and sustained in the watershed.

Similarly, Section VI.A of the January 16, 2004 Staff Report for the Trash TMDL for the Ballona Creek and Wetlands (LARWQCB, 2004b) and the corresponding 2004 Basin Plan Amendment (LARWQCB, 2004a) established that the Regional Board would review and reconsider the final WLAs once a reduction of 50% has been achieved and sustained in the watershed.

As shown in Tables 3 and 4, a reduction of greater than 50% in the baseline trash loads has been reported by the majority of responsible agencies and sustained in both watersheds.

1.1 The Problem of Trash in Waterbodies Continues

Trash in waterbodies causes significant water quality problems. Small and large floatables can inhibit the growth of aquatic vegetation, decreasing spawning areas and habitats for fish and other living organisms. Wildlife living in rivers and in riparian areas can be harmed by ingesting or becoming entangled in floating trash. Floating debris that is not trapped and removed will eventually end up on the beaches or in the open ocean, repelling visitors away from our beaches and degrading coastal waters. Settleables include glass, cigarette butts, rubber, construction debris and more. Settleables can be a problem for bottom feeders and can contribute to sediment contamination. Some debris (e.g. diapers, medical and household waste, and chemicals) is a source of bacteria and toxic substances. The impacts of trash on beneficial uses and the current

condition of waterbodies with regard to trash impairments have been well summarized in the State Water Resources Control Board's (State Water Board) staff report supporting its proposed amendments to the California Ocean Plan and the Inland Surface Waters and Enclosed Bays and Estuaries of California Plan to incorporate a water quality objective for trash and associated implementation provisions. Appendix A, Parts I and II of the State Water Board's staff report is included as Attachment A in its entirety.

The continued presence of trash in the Los Angeles River and Ballona Creek as described further in section 1.3.2, below, and the well documented negative impacts to beneficial uses supports the continued need for these TMDLs and the established targets and allocations, therein.

The prevention and removal of trash in the Los Angeles River and Ballona Creek Watersheds ultimately will lead to improved water quality and attainment of water quality standards. This, in turn, will aid in the protection of aquatic life and habitat, enhance the quality of recreational opportunities for the public, protect public health, and increase public interest in these waterbodies as valuable recreational and ecological resources.

1.2 Regulation of Trash through the Los Angeles River and Ballona Creek Trash TMDLs

1.2.1 The Establishment of the Los Angeles River and Ballona Creek Trash TMDLs

The Los Angeles River and Ballona Creek Trash TMDLs were among the first TMDLs in the Los Angeles Region and in California, and among the first trash TMDLs in the nation to address waterbody impairments due to trash in highly urbanized watersheds.

The Regional Board originally established the Los Angeles River Trash TMDL, by Resolution No. R01-013, on September 19, 2001. This TMDL included an implementation plan requiring a progressive reduction of trash in the Los Angeles River Watershed to achieve final WLAs by September 30, 2015. This TMDL was subsequently approved by the State Water Board on February 19, 2002, the Office of Administrative Law (OAL) on July 16, 2002, and the United States Environmental Protection Agency (USEPA) on August 1, 2002. The TMDL went into effect on August 28, 2002.

On June 8, 2006, pursuant to a writ of mandate in litigation filed by several cities challenging the TMDL, the Regional Board set aside Resolution No. R01-013 and the TMDL (Resolution No. 06-013). The Regional Board directed its staff to prepare and submit for the Board's reconsideration, as soon as possible, a revised TMDL consistent with the requirements of the writ of mandate, including revised California Environmental Quality Act (CEQA) documentation. On July 19, 2006, the State Water Board set aside Resolution No. 2002-0038, which had approved the TMDL, and remanded the TMDL to the Regional Board for further action.

On August 9, 2007, the Regional Board adopted, by Resolution No. R07-012, a new Los Angeles River Trash TMDL. This TMDL included an implementation plan requiring a progressive

reduction of trash in the Los Angeles River Watershed to achieve final WLAs by September 30, 2016. The 2007 TMDL went into effect on September 23, 2008 (LARWQCB, 2007a).

The Regional Board established the Ballona Creek Trash TMDL, by Resolution No. R01-014, on September 19, 2001. This TMDL also included an implementation plan requiring a progressive reduction of trash in the Ballona Creek Watershed to achieve final WLAs by September 30, 2015. This TMDL was subsequently approved by the State Water Board on February 19, 2002, the OAL on July 18, 2002, and the USEPA on August 1, 2002. The TMDL went into effect on August 28, 2002 (LARWQCB, 2001). On March 4, 2004, by Resolution No. 04-023, the Regional Board amended the Ballona Creek Trash TMDL by incorporating minor language changes concerning implementation of the TMDL. The amendments were approved by the State Water Board on September 30, 2004 and the OAL on February 8, 2005. USEPA approval of the amendments was not required due to the nature of the changes. The revisions went into effect on August 11, 2005 (LARWQCB, 2004a).

The regulatory background, beneficial uses to be protected, geographical extent and complete TMDL elements, along with supporting analysis, are fully described in the respective staff reports and amendments to the Water Quality Control Plan for the Los Angeles Region (Basin Plan) (LARWQCB, 2001, 2004a and 2007a) at (http://www.waterboards.ca.gov/losangeles/water_issues/programs/tmdl/tmdl_list.shtml) and are not repeated, herein.

1.2.2 Trash Controls in Statewide Water Quality Control Plans

The State Water Board has proposed an amendment to incorporate provisions to control discharges of trash to the Water Quality Control Plan for Ocean Waters of California (Ocean Plan) and a similar amendment to the Water Quality Control Plan for Inland Surface Waters, Enclosed Bays, and Estuaries (ISWEBE Plan) Part 1 Trash Provision (State Trash Amendments). The purpose of the State Trash Amendments is to provide a statewide regulatory approach to protect aquatic life and public health beneficial uses from impacts due to trash in waterbodies statewide.

On June 10, 2014, the State Water Board released draft documents on the State Trash Amendments to the public for comment. On December 31, 2014, the State Water Board released proposed final documents for public review (SWRCB, 2014). On March 26, 2015, the State Water Board released revised proposed final documents (SWRCB, 2015). Adoption of the proposed final documents is anticipated in April 2015.

Because of the significant efforts that have already occurred to address trash impairments in waterbodies within the Los Angeles Region, the proposed final State Trash Amendments do not apply to waters within the jurisdiction of the Los Angeles Regional Board that have trash TMDLs in effect prior to the effective date of the State Trash Amendments. However, within one year of the State Trash Amendments' effective date, the proposed amendments direct the Los Angeles Regional Board to convene a public meeting to reconsider the scope of its trash TMDLs to particularly consider an approach that would focus its MS4 permittees' trash-control efforts on

high-trash generation areas within each permittee's jurisdiction. This reconsideration of scope does not apply, however, to the Los Angeles River and Ballona Creek Trash TMDLs given that the final implementation deadlines for these TMDLs are in 2016 and 2015, respectively. The revised proposed final Part 1 Trash Provisions of the Water Quality Control Plan for Inland Surface Waters, Enclosed Bays, and Estuaries of California states under Chapter IV – Implementation of Water Quality Objectives of the ISWEBE Plan, Part A.1.b:

> *b. These TRASH PROVISIONS apply to all surface waters of the State, with the exception of those waters within the jurisdiction of the Los Angeles Regional Water Quality Control Board (Los Angeles Water Board) for which trash Total Maximum Daily Loads (TMDLs) are in effect prior to the effective date of these TRASH PROVISIONS; provided, however, that:*
>
> *…*
>
> *(2) Within one year of the effective date of these TRASH PROVISIONS, the Los Angeles Water Board shall convene a public meeting to reconsider the scope of its trash TMDLs, with the exception of those for the Los Angeles River and Ballona Creek watersheds, to particularly consider an approach that would focus MS4 permittees' trash-control efforts on high-trash generation areas within their jurisdictions.*

The corresponding Staff Report states the following in Section 1.3 *Effect on Existing Basin Plans, Trash-Related TMDLs and Permits*:

> *The proposed final Trash Amendments would apply to all surface waters in the state, with the exception of those waters with the jurisdiction of the Los Angeles Water Board that have trash TMDLs in effect prior to the Trash Amendments. As the fifteen trash TMDLs in the Los Angeles Region have more stringent provisions than the proposed final Trash Amendments, the proposed final Trash Amendments would not result in a degradation of water quality standards in those water. While the proposed final Trash Amendments do not apply to existing trash TMDLs in the Los Angeles Region, the proposed Trash Amendments direct the Los Angeles Water Board to reconsider the scope of its trash TMDLs within one year of the Trash Amendments' effective date and focus its permittees' trash control efforts on high trash generation areas rather than all areas within each permittee's jurisdiction. The reconsideration would occur for all existing trash TMDLs, except for the Los Angeles River Watershed and Ballona Creek Trash TMDLs, because those two TMDLs are approaching final compliance deadlines of September 30, 2016 and September 30, 2015, respectively.*

1.3 Los Angeles River and Ballona Creek Trash TMDL Status

Both the Los Angeles River Trash TMDL and Ballona Creek Trash TMDL were in effect as of September 23, 2008 and August 28, 2002, respectively. Both TMDLs were subsequently incorporated into the Los Angeles County Municipal Separate Storm Sewer System (MS4) Permit. The WLAs and associated requirements of the Los Angeles River Trash TMDL were first incorporated into the Los Angeles County MS4 Permit through a reopener of the 2001

permit in 2009 (Order No. R4-2009-0130). These provisions were carried over during the reissuance of the Los Angeles County MS4 Permit in 2012 (Order No. R4-2012-0175) and similar provisions were also included at that time for the Ballona Creek Trash TMDL. The Los Angeles River Trash TMDL was also incorporated into the City of Long Beach MS4 Permit (Order No. R4-2014-0024). Provisions to implement both TMDLs were incorporated into the California Department of Transportation (Caltrans) Statewide Stormwater Permit (State Board Order No. 2012-0011-DWQ). The provisions of the Los Angeles River Trash TMDL have yet to be incorporated into the Ventura County MS4 Permit for the single MS4 permittee, the City of Simi Valley, which is subject to the Ventura County MS4 Permit but has some land area within the Los Angeles River watershed.

1.3.1 MS4 Compliance with Los Angeles River and Ballona Creek Trash TMDLs

The Trash TMDLs include three general implementation approaches, which are full capture systems, partial capture devices, and institutional controls, or any combination of these. MS4 permittees are assigned interim and final WLAs in the Los Angeles River and Ballona Creek Trash TMDLs and the WLAs are included as water quality-based effluent limitations (WQBELs) in MS4 permits, as described above. Demonstration of compliance under the MS4 permits can be assessed as percent of catch basins (or area draining to catch basins), which have been retrofitted with a certified full capture system or can be assessed as effectiveness of partial capture and institutional controls using either a mass balance approach, based on the daily generation rate (DGR) for trash from a representative area or a performance based approach, based on the performance of the device(s) and control(s) in the implementing area. (Los Angeles County MS4 Permit, Part VI.E.5.b.i.(1)-(3))

An examination of compliance data submitted since the 2012 Los Angeles County MS4 Permit became effective is summarized in the tables, below. This compliance data was submitted to the Regional Board in the form of TMDL compliance reports as an attachment or within Permittees' annual reports. In some cases, it was difficult for Regional Board staff to verify the degree of compliance because some MS4 Permittees reported summary data without including the underlying data and there were also inconsistencies in the assumptions made by MS4 Permittees.

In the Los Angeles River, for the 2012-2013 storm year, the interim WQBEL was a reduction in trash to 20% of the baseline annual trash load for each jurisdiction (as calculated in 2002-2003). For the 2013-2014 storm year, the interim WQBEL was a reduction in trash to 10% of the baseline annual trash load.

Table 1 Compliance Summary for the Los Angeles River Trash TMDL

Los Angeles River Trash TMDL Compliance Summary		
In Compliance	2012-2013 Reporting Year (20% of Baseline) (# of Permittees)	2013-2014 Reporting Year (10% of Baseline) (# of Permittees)
Yes	24	14
No	8	12
Undetermined	11	17
N/A	1	1

Undetermined: Compliance cannot be determined based on the information provided to the Regional Board because information is missing, or is of insufficient quality to determine compliance with interim WQBELs.
N/A: Assessment was not applicable for the City of Santa Clarita because there is no MS4 in the portion of City of Santa Clarita's jurisdiction that lies within the Los Angeles River watershed. Recommendations concerning the City of Santa Clarita are discussed below.

In Ballona Creek, for the 2012-2013 storm year, the interim WQBEL was a reduction in trash to 10% of the baseline annual trash load as calculated in 2002-2003. For the 2013-2014 storm year, the interim WQBEL was a reduction in trash to 3.3% of the baseline annual trash load.

Table 2 Compliance Summary for the Ballona Creek Trash TMDL

Ballona Creek Trash TMDL Compliance Summary		
In Compliance	2012-2013 Reporting Year (10% of Baseline) (# of Permittees)	2013-2014 Reporting Year (3.3% of Baseline) (# of Permittees)
Yes	2	1
No	2	3
Undetermined	3	3

Undetermined: Compliance cannot be determined based on the information provided to the Regional Board because information is missing, or is of insufficient quality to determine compliance with interim WQBELs.

In the following two tables, the column labeled % FCS is the percentage of storm drain catch basins within the portion of the jurisdiction's drainage to the perspective watershed that has certified full capture systems installed within those catch basins. For the column labeled partial capture/institutional controls, the percentage of trash reduced (% Trash Reduced) was calculated by dividing the estimate of the total trash discharged for the year using daily generation rates (DGRs) by the baseline and interim allocations.

Table 3 Compliance Summary by Method of Compliance for Los Angeles River

Permittee	2012-2013 Reporting Year (20% of Baseline)				2013-2014 Reporting Year (10% of Baseline)			
	Full Capture System (FCS)		Partial Capture and Institutional Controls (PCIC)		Full Capture System (FCS)		Partial Capture and Institutional Controls (PCIC)	
	% FCS	Compliance	% Trash Reduced	Compliance	% FCS	Compliance	% Trash Reduced	Compliance
Alhambra	58.3%	N/A	70.2%	No	58.3%	N/A	86.3%	No
Arcadia[#]	***95.4%***	Undetermined	N/A	N/A	***95.4%***	Undetermined	N/A	N/A
Bell	91.9%	Yes	N/A	N/A	91.9%	Yes	N/A	N/A
Bell Gardens	93.4%	Yes	N/A	N/A	93.4%	Yes	N/A	N/A
Bradbury	0.0%	N/A	90.6%	Yes	100.0%	Yes	N/A	N/A
Burbank[#]	*87.2%*	Undetermined	N/A	N/A	*86.6%*	Undetermined	N/A	N/A
Calabasas	72.0%	No	N/A	N/A	72.0%	Undetermined	N/A	N/A
Carson	**91.7%**	Yes	N/A	N/A	**91.7%**	Yes	N/A	N/A
Commerce	**84.7%**	Undetermined	N/A	N/A	**84.7%**	No	N/A	N/A
Compton	**87.1%**	Yes	N/A	N/A	***87.1%***	Undetermined	N/A	N/A
Cudahy	**88.4%**	Yes	N/A	N/A	**88.4%**	No	N/A	N/A
Downey	89.7%	Yes	N/A	N/A	89.7%	Yes	N/A	N/A
Duarte	**13.2%**	No	N/A	N/A	**13.2%**	No	N/A	N/A
El Monte	U	Undetermined	N/A	N/A	U	Undetermined	N/A	N/A
Glendale[#]	***60.1%***	Undetermined	N/A	Undetermined	***67.4%***	Undetermined	N/A	Undetermined
Hidden Hills	N/A	N/A	99.6%	Yes	N/A	N/A	99.8%	Yes
Huntington Park	**86.0%**	Yes	N/A	N/A	**85.6%**	No	N/A	N/A
Irwindale	N/A	Undetermined	N/A	N/A	N/A	Undetermined	N/A	N/A
La Cañada Flintridge	71.9%	No	N/A	N/A	71.9%	No	N/A	N/A
Long Beach	U	Undetermined	N/A	Undetermined	U	Undetermined	N/A	Undetermined
Los Angeles	N/A	N/A	91.5%	Yes	**17.1%**	N/A	91.5%	Yes
Los Angeles County	86.7%	Yes	N/A	N/A	96.4%	Yes	N/A	N/A
Lynwood	**92.2%**	Yes	N/A	N/A	**92.2%**	Yes	N/A	N/A
Maywood	**85.4%**	Yes	N/A	N/A	**85.4%**	No	N/A	N/A
Monrovia	N/A	N/A	98.5%	Yes	N/A	N/A	99.5%	Yes
Montebello	83.5%	Yes	N/A	N/A	83.5%	No	N/A	N/A
Monterey Park	36.8%	N/A	90.2%	Yes	36.8%	N/A	97.8%	Yes
Paramount	92.0%	Yes	N/A	N/A	*95.4%*	Undetermined	N/A	N/A
Pasadena	*44.0%*	Undetermined	N/A	N/A	*44.0%*	Undetermined	N/A	N/A
Pico Rivera	**83.6%**	Yes	N/A	N/A	***86.6%***	Undetermined	N/A	N/A
Rosemead	**5.8%**	No	N/A	N/A	**44.3%**	No	N/A	N/A
San Fernando	5.9%	No	N/A	N/A	9.9%	No	N/A	N/A
San Gabriel[#]	23.7%	No	N/A	N/A	17.5%	No	N/A	N/A

Permittee	2012-2013 Reporting Year (20% of Baseline)				2013-2014 Reporting Year (10% of Baseline)			
	Full Capture System (FCS)		Partial Capture and Institutional Controls (PCIC)		Full Capture System (FCS)		Partial Capture and Institutional Controls (PCIC)	
	% FCS	Compliance	% Trash Reduced	Compliance	% FCS	Compliance	% Trash Reduced	Compliance
San Marino	U	Undetermined	N/A	Undetermined	U	Undetermined	N/A	Undetermined
Santa Clarita	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Sierra Madre	0.9%	No	N/A	N/A	0.9%	No	N/A	N/A
Signal Hill	89.0%	Yes	N/A	N/A	***89.0%***	Undetermined	N/A	Undetermined
Simi Valley	U	Undetermined	N/A	Undetermined	U	Undetermined	N/A	Undetermined
South El Monte	U	Undetermined	N/A	N/A	U	Undetermined	N/A	N/A
South Gate	**85.8%**	Yes	N/A	N/A	**85.8%**	Undetermined	N/A	N/A
South Pasadena	N/A	N/A	95.9%	Yes	N/A	N/A	98.5%	Yes
Temple City	N/A	N/A	94.0%	Yes	N/A	N/A	97.1%	Yes
Vernon	**93.1%**	Yes	N/A	N/A	**91.5%**	Yes	N/A	N/A
Caltrans	U	Undetermined	N/A	Undetermined	U	Undetermined	N/A	Undetermined

Undetermined: Compliance cannot be determined based on the information provided to the Regional Board because information is missing, or is of insufficient quality to determine compliance with interim or final WLAs.
N/A: Assessment was not applicable. A Permittee's compliance is either assessed per the FCS method or the PCIC method, as described above.
U: Unverified
[#]: Includes only permittee-owned catch basins and does not include LACFCD catch basins within the permittee's jurisdiction.
Italics: Values have been reported by permittees but supporting data have not been provided for verification
Bolded: Actual trash reduction may be higher due to installation of partial capture devices as well

Table 4 Compliance Summary by Method of Compliance for Ballona Creek

Permittee	2012-2013 Reporting Year (10% of Baseline)				2013-2014 Reporting Year (3.3% of Baseline)			
	Full Capture System (FCS)		Partial Capture and Institutional Controls (PCIC)		Full Capture System (FCS)		Partial Capture and Institutional Controls (PCIC)	
	% FCS	Compliance	% Trash Reduced	Compliance	% FCS	Compliance	% Trash Reduced	Compliance
Beverly Hills	U	Undetermined	N/A	Undetermined	U	Undetermined	N/A	Undetermined
Culver City	20.4%	N/A	90.5%	Yes	95.4%	N/A	74.8%	No
Inglewood	0.4%	No	N/A	N/A	0.4%	No	N/A	N/A
Los Angeles	N/A	N/A	98%	Yes	N/A	N/A	98%	Yes
Los Angeles County	84.4%	No	N/A	N/A	88.0%	No	N/A	N/A
Santa Monica	U	Undetermined	N/A	Undetermined	U	Undetermined	N/A	Undetermined
West Hollywood	U	Undetermined	N/A	Undetermined	U	Undetermined	N/A	Undetermined

Undetermined: Compliance cannot be determined based on the information provided to the Regional Board because information is missing, or is of insufficient quality to determine compliance with interim or final WLAs.
N/A: Assessment was not applicable. A Permittee's compliance is either assessed per the FCS method or the PCIC method, as described above.
U: Unverified

1.3.2 Status of Trash in Receiving Waters

While a great deal has been accomplished to control trash in the Los Angeles River Watershed and Ballona Creek Watershed, as detailed above, there is still considerable trash in waterbodies in both watersheds. The Los Angeles River and Ballona Creek Trash TMDLs do not, yet, include the requirement for receiving water monitoring for trash; however, information on trash is available from academic studies, trash "clean up" events, debris booms, and Regional Board surveys.

Academic studies

Numerous studies have been conducted in recent years concerning trash and, especially, plastics in southern California (Midbust et al., 2014; Moore et al., 2011; Stevenson, 2011 among others). Many of these studies have focused on plastics as a great deal of the trash that remains in waterbodies is plastics.

A 2011 study of trash in the Los Angeles and San Gabriel Rivers (Moore et al., 2011) calculated that approximately 2.3 billion plastic objects and fragments, with a total weight of 30 metric tons, were being transported by both rivers in a 72-hour period including rain events. The majority of pieces (71%) were foams, with miscellaneous fragments making up 14%, pre-production resin pellets making up 10%, and whole items making up 1%. Plastic particles less than 5 mm in size were 16 times more abundant than those greater than 5 mm.

Clean up events

Non-governmental organizations including Heal the Bay, Friends of the Los Angeles River (FoLAR), and Ballona Creek Renaissance conduct in-stream and coastal trash clean-up events, which provide snapshots of the amount of trash in the Los Angeles River and Ballona Creek.

Los Angeles River Watershed

Between 2004 and 2011, FoLAR has held 22 cleanup events with roughly 4,000 people participating in 2011 (FoLAR, 2011). These events were held in five locations: Lake Balboa, Fletcher Drive, Steelhead Park, Compton Creek, and Willow Street. In addition to trash collection, FoLAR sorts a subsample of the trash to determine the types of trash that are most commonly found in the river. Collected trash was sorted into 15 different categories with plastic making up the majority of the trash by weight and volume, followed by clothes and fabric or metal, depending on the site, and food service packaging in a few sites (FoLAR, 2011 and 2012).

Ballona Creek Watershed

Ballona Creek Renaissance organized or documented nine separate clean-up events within the Ballona Creek Estuary in 2014. These events were held at different locations in the estuary and collected between 50 to 869 pounds of trash per event, with an annual total of 2,373.5 pounds of trash collected (Ballona Creek Renaissance, 2014).

Debris booms

The County of Los Angeles has installed a debris boom near the mouth of the Los Angeles River Estuary at the Ocean Boulevard Bridge. This boom was installed in 2000 and was fully

optimized in 2007-08. Even after optimization, the boom was designed to capture a certain design flow while bypassing the higher flows due to flooding concerns. The collected trash and other debris is gathered for disposal, but not separated or sorted. From April 2013 to April 2014, the County of Los Angeles Public Works Maintenance collected roughly 1,200 tons of debris from the Los Angeles River Estuary. Observations indicated that most of the debris was vegetation with smaller amounts of trash including plastics, packaging, etcetera (Naing, Win, County of Los Angeles, February 24, 2015, personal communication).

The County of Los Angeles has also installed a debris boom near the mouth of the Ballona Creek Estuary downstream of Lincoln Boulevard Bridge. Like the Los Angeles River debris boom, this boom is only designed to capture a certain design flow and the trash is gathered for disposal but not separated or sorted. From April 2013 to April 2014, the County of Los Angeles Public Works Maintenance collected roughly 6 tons of trash from Ballona Creek Estuary, and observed that most of it was vegetation with smaller amounts of trash including plastics, packaging, etcetera. County of Los Angeles Public Works Maintenance observed that the proportion of trash to vegetation was higher in Ballona Creek than the Los Angeles River (Naing, Win, County of Los Angeles, February 24, 2015, personal communication).

Regional Board surveys

In 2011, the Regional Board conducted recreational use surveys of the Los Angeles River as part of its project, Re-evaluation of Recreational Uses in the Los Angeles River Watershed. Photographs taken by staff during these surveys show continued presence of trash in the Los Angeles River.

Figure 1 Plastic Chairs in Compton Creek, July 1, 2011

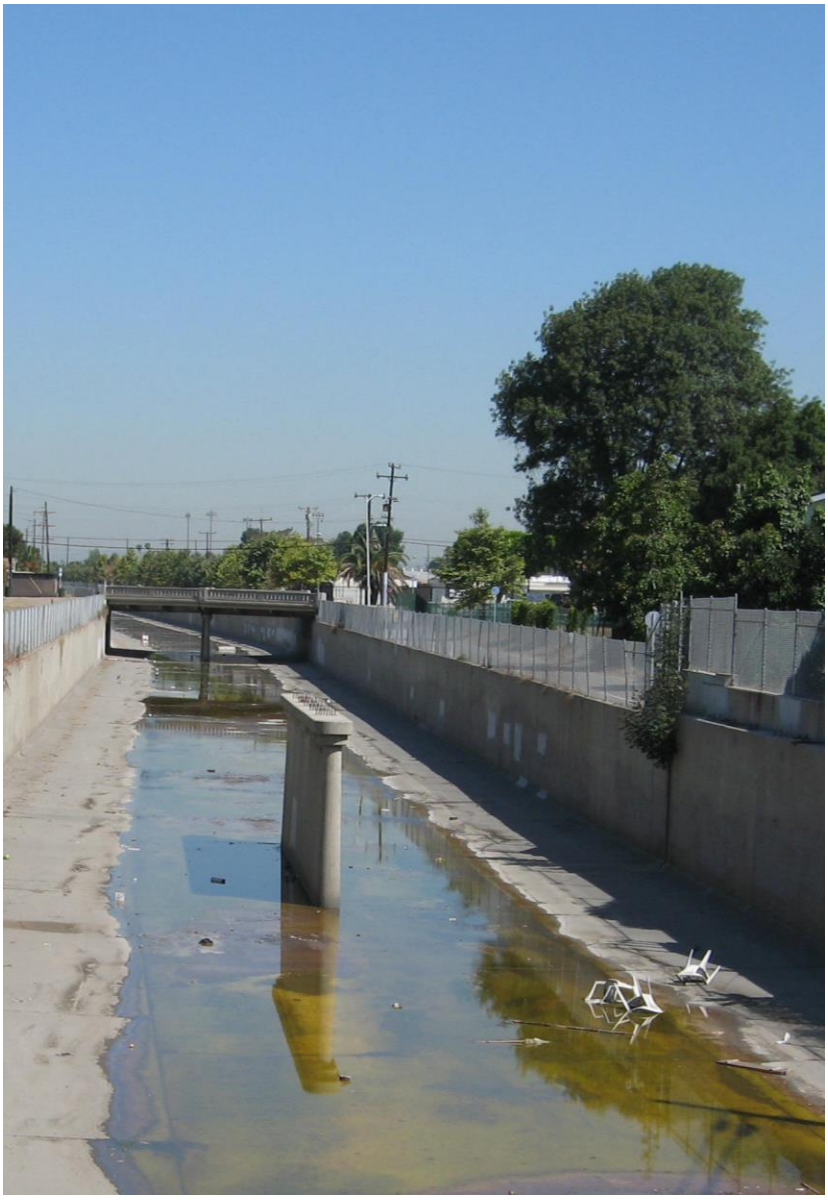

Figure 2 Shredded Plastics, Cudahy River Park, July 1, 2011

Figure 3 Plastic, Paper and Metal Debris, Arroyo Seco, Herman Park, July 1, 2011

2 Technical Matters to be Reconsidered

This reconsideration is not a general reconsideration of each and every element of these TMDLs. No significant changes are proposed to the existing fundamental technical TMDL elements that were established in the original TMDLs, including the Numeric Targets, Loading Capacity, WLAs and LAs, Margins of Safety, and Critical Condition and Seasonal Variations in either the Los Angeles River or Ballona Creek Trash TMDLs. Neither are there significant changes proposed to the overarching compliance options – full capture systems, partial capture devices, and institutional controls – identified in the Los Angeles River and Ballona Creek Trash TMDLs. The proposed changes are intended to ensure consistency between the two TMDLs where appropriate; advance alternatives for demonstrating full compliance; include greater specificity regarding responsible entities assigned WLAs and LAs; and expand monitoring requirements.

2.1 Responsible Entities

2.1.1 Flood Control Districts

In the Los Angeles River Trash TMDL and the Ballona Creek Trash TMDL, WLAs were assigned to MS4 Permittees based on land area. When these TMDLs were established, the Los Angeles County Flood Control District (LACFCD) was not identified as a responsible entity at that time. However, for clarification and consistent with recent practice, the Regional Board now recognizes LACFCD's separate authority over the MS4 and the fact that some of the key compliance strategies for the trash TMDLs rely on installations within the flood control districts' infrastructure. The Regional Board also recognizes the importance of the public agency activity provisions in MS4 permits relative to trash control, which flood control districts are required to implement. These include responsibilities for performing storm drain operation and maintenance, including: catch basin inspection and cleaning; open channel maintenance that includes removal of trash and debris; and implementation of activity specific BMPs, including those related to litter/debris/graffiti.

In fact, because of this, LACFCD was named as a responsible agency in the more recent Santa Monica Bay Debris TMDL (LARWQCB, 2010a and 2010b). The Santa Monica Bay Debris TMDL includes the Ballona Creek Watershed, therefore, LACFCD is already identified as a responsible agency in that watershed.

In the Santa Monica Bay Debris TMDL, LACFCD may be held responsible along with a jurisdiction and/or agency for non-compliance where the flood control district has either:

(i) without good cause denied necessary authority to a responsible jurisdiction or agency for the timely installation and/or maintenance of full and/or partial capture trash control devices for purposes of TMDL compliance in parts of the MS4 physical infrastructure that are under its authority, or

(ii) not fulfilled its obligations under its MS4 permit regarding proper BMP installation, operation and maintenance for purposes of TMDL compliance within the MS4 physical infrastructure under its authority,

thereby causing or contributing to a responsible jurisdiction and/or agency to be out of compliance with its interim or final WLAs.

Under these circumstances, the Santa Monica Bay Debris TMDL further states that LACFCD's responsibility shall be limited to non-compliance related to the drainage area(s) within the jurisdiction where the flood control district has authority over the relevant portions of the MS4 physical infrastructure.

Recommendation: Update the Los Angeles River Trash TMDL to identify flood control districts as separate responsible agencies in the same manner as in the Santa Monica Bay Debris TMDL, and clarify that the LACFCD is already a responsible agency in the Ballona Creek Trash TMDL.

2.1.2 MS4 Permittees including MS4 Phase II Permittees

Per federal regulations, MS4 permits were developed in two phases. Phase I, which started in 1990, included the adoption of National Pollutant Discharge Elimination System (NPDES) permits for discharges from MS4s in medium (serving between 100,000 and 250,000 people) and large (serving more than 250,000 people) municipalities or metropolitan areas. In the Los Angeles Region, Phase I MS4 permits have been issued to (1) Ventura County, Ventura County Watershed Protection District, and the municipalities in Ventura County; (2) Los Angeles County, Los Angeles County Flood Control District, and the municipalities in Los Angeles County except the City of Long Beach; and (3) the City of Long Beach.

Phase II addresses MS4 discharges from small municipalities (population less than 100,000) and non-traditional MS4s, such as public campuses, military bases, prison and hospital complexes, and State parks. On April 30, 2003, the State Water Board issued a General Permit for the Discharge of Storm Water from Small MS4s (WQ Order No. 2003-0005-DWQ) to provide permit coverage for these smaller municipalities and non-traditional MS4s. The Phase II Small MS4 General Permit covers Phase II Permittees statewide. The 2003 Phase II Small MS4 General Permit was issued for a 5-year permit term. The 2003 General Permit expired in May 2008; however, it continued in force and in effect until the State Water Board reissued the permit in 2013 (Order No. 2013-0001 DWQ). The Los Angeles Region has only a single traditional Phase II MS4 Permittee, the City of Avalon, located on Catalina Island, which is not subject to either of the trash TMDLs being reconsidered. Non-traditional Phase II MS4 Permittees are discussed below for each watershed.

Los Angeles River

The Los Angeles River Trash TMDL includes interim and final WLAs for Phase I MS4 Permittees and also specifies a final WLA for Phase II MS4 Permittees.

An implementation schedule for Phase II MS4 Permittees will be established as specific TMDL provisions are incorporated into the Statewide Phase II Small MS4s General Permit or when a regional Phase II MS4 permit is issued.

Phase II MS4 facilities designated in the 2013 Phase II MS4 General Permit within the Los Angeles River watershed include:

- California State University, Los Angeles
- California State University, Northridge
- University of California, Los Angeles, offsite facilities

The 2013 Phase II MS4 General Permit provides that other non-traditional facilities may be designated by the Regional Board as Phase II MS4 Permittees on a case-by-case basis in the future.

Ballona Creek

In contrast to the Los Angeles River Trash TMDL, the Ballona Creek Trash TMDL includes interim and final WLAs for "municipal permittees."

In order to maintain consistency and sufficient flexibility to ensure fairness, the Ballona Creek Trash TMDL should be updated to include all designated and potential Phase II MS4 Permittees, both municipal and non-traditional.

An implementation schedule for Phase II MS4 Permittees will be established as specific TMDL provisions are incorporated into the Statewide Phase II Small MS4s General Permit or when a regional Phase II MS4 permit is issued.

Phase II MS4 facilities designated in the 2013 Phase II MS4 General Permit within the Ballona Creek watershed include:

- University of California, Los Angeles main campus and offsite facilities
- VA Greater Los Angeles Healthcare System (GLA)

The 2013 Phase II MS4 General Permit provides that other non-traditional facilities may be designated by the Regional Board as Phase II MS4 Permittees on a case-by-case basis in the future.

In addition, in the Los Angeles River Trash TMDL, the Phase I MS4 Permittees are listed by name in the Basin Plan Amendment language, while in the Ballona Creek Trash TMDL, the MS4 Permittees are named only in the Staff Report, but not the Basin Plan Amendment language. For clarity, the names of the Phase I MS4 Permittees (as well as designated Phase II MS4 Permittees) in the Ballona watershed should be included in the Basin Plan Amendment language.

Recommendation: Include both municipal and non-traditional Phase II MS4 Permittees in the Ballona Creek Trash TMDL. Identify by name the Phase I and designated Phase II MS4 Permittees in the Ballona Creek Trash TMDL Basin Plan Amendment language and the designated Phase II MS4 Permittees in the Los Angeles River Trash TMDL Basin Plan Amendment language.

2.1.3 Santa Clarita

The City of Santa Clarita was assigned WLAs in the Los Angeles River Trash TMDL as a MS4 Permittee because a small area within the City's jurisdiction is in the Los Angeles River Watershed.

Accordingly, requirements for trash reductions in MS4 discharges from the City of Santa Clarita were included in the Los Angeles County MS4 Permit.

In the City of Santa Clarita's Annual Report on TMDL Compliance with the Los Angeles River Trash TMDL to the Regional Board dated November 15, 2011, the City of Santa Clarita clarified that the Los Angeles River watershed area, 0.21 sq. miles, is undeveloped open space and that there are no storm drains or MS4 infrastructure in the area. The City has undertaken trash management activities in the area such as street sweeping and monitoring for illegal dumping.

Further, the Individual Annual Report Form (Attachment U-4) for the Los Angeles County MS4 Permit filed by the City of Santa Clarita for 2014, reported that the City of Santa Clarita has posted six "No Dumping" signs and continues to clean and maintain the 0.09 sq. mile area.

Regional Board staff inspected the area in September of 2013 and confirmed that no MS4 features (roads with drainage systems, municipal streets, catch basins, curbs, gutters, ditches, man-made storm channels, or drains) are located within the 0.09 sq. mile area of the Los Angeles River watershed located within the City of Santa Clarita. The Sierra Highway is the only road through this area and it is a State Department of Transportation (Caltrans) Highway. Regional Board staff also confirmed that the size of the City's area within the Los Angeles River watershed is 0.09 sq. mile.

The City of Santa Clarita, in coordination with the County of Los Angeles and the Los Angeles County Flood Control District (LACFCD), is developing an Enhanced Watershed Management Program (EWMP) for the Upper Santa Clara River Watershed to comply with requirements of the Los Angeles County MS4 Permit. A workplan for this EWMP was submitted to the Regional Board in June 2014. In addition to implementation of the EWMP for areas with MS4s, the EWMP will also address portions of the City of Santa Clarita and County of Los Angeles that are rural and undeveloped. The EWMP workplan includes the undeveloped area (0.09 square mile) of the Los Angeles River watershed located within the City of Santa Clarita. Institutional controls, such as street sweeping, will contribute to the control of trash in that area. The City of Santa Clarita should, therefore, be provided a load allocation rather than a WLA in the Los Angeles River Trash TMDL.

However, if there are any changes in land use or drainage infrastructure in the portion of the City of Santa Clarita within the Los Angeles River watershed, the Regional Board reserves the right to reconsider the City's responsibility under the Los Angeles River Trash TMDL and to re-impose MS4 requirements on the City of Santa Clarita to ensure that water quality is protected.

The City of Santa Clarita's baseline WLA is 901 gallons (2,336 lbs.) of trash. See section 2.4.2 and 2.4.3, below, for requirements for monitoring and complying with load allocations for trash.

Recommendation: Change the WLA for the City of Santa Clarita in the Los Angeles River Trash TMDL to a load allocation. The City of Santa Clarita will then comply with the LA as described in Section 2.3, below.

2.2 Compliance Determination

MS4 Permittees have several compliance options to achieve the requirement of zero trash discharged to the Los Angeles River and Ballona Creek. These include:

(i) a technology based approach whereby best management practices (BMPs) meeting the design standard of "full capture" may be properly installed and maintained

throughout the Permittee's drainage within the watershed to demonstrate compliance with the WLAs,

(ii) a numeric effluent limitation based approach whereby "partial capture" BMPs and institutional controls not meeting the design standard of "full capture" may be implemented in drainage areas, in which case compliance with the WLA shall be demonstrated by measuring actual reductions in trash discharges in these areas (or, alternatively, the performance of these BMPs in the implementing area).

Either or both approaches may be used within a jurisdictional area.

Staff does not recommend changing these options in the Los Angeles River or Ballona Creek Trash TMDLs. However, these options present several practical issues in determining compliance.

2.2.1 Municipalities Approaching 100% Compliance using Full Capture Systems

For municipalities implementing the Los Angeles River or Ballona Creek Trash TMDLs by retrofitting all catch basins with full capture systems, compliance is demonstrated when 100% of the catch basins in the jurisdiction have been retrofitted with a certified full capture system or 100% of the drainage area is served by full capture systems (where devices may be located within the MS4 downgradient of several catch basins).

Exclusive use of full capture systems provides advantages and many responsible agencies have chosen to use full capture systems exclusively to achieve their WLAs. However, some of these responsible agencies have found that there are some catch basins for which retrofitting with a full capture system, or even a partial capture device, is technically infeasible due to the configuration of the catch basin (i.e., usually too shallow to accommodate a full capture system). In these cases, installation of a full capture system would create a flood risk or would require significant expense to redesign the catch basin and the connected storm drain system that may be out of proportion with the reduction in trash that would be achieved.

Under both the Los Angeles River and Ballona Creek Trash TMDLs, for areas where catch basins have partial capture devices or have no structural trash control devices, a responsible agency has the option of implementing institutional controls or a combination of partial capture devices and institutional controls and then assessing compliance within the catchment area using a mass balance approach based on a Daily Generation Rate (DGS) to calculate the annual trash discharge. However this compliance alternative is not practical for a responsible agency that has installed full capture systems everywhere technically feasible leaving only a few unretrofitted catch basins irregularly interspersed with the full capture retrofitted catch basins. The mass balance/DGR approach is used on a subwatershed or catchment basis, so because there is a mixture of full capture retrofitted catch basins and unretrofitted catch basins in the same subwatershed, on the same street, it is not possible to apply the mass balance/DGR approach.

Alternatively, staff propose that in drainage areas where the vast majority of catch basins are retrofitted with full capture systems and there are only a few catch basins for which retrofit is

technically infeasible, which are mixed among the retrofitted catch basins, responsible agencies may request that the Executive Officer make a determination that the agency is in full compliance with their WLA/WQBEL under either TMDL if all of the following criteria are met:

- 98% of all catch basins within the agency's jurisdictional land area in the watershed are retrofitted with FCS (or, alternatively, 98% of the jurisdiction's drainage area is addressed by FCS) and at least 97%[1] of the catch basins (or, alternatively, drainage area) within the agency's jurisdiction in the subwatershed (the smaller of the HUC-12 equivalent area or tributary subwatershed) are retrofitted with FCS.
- The agency prepares and submits to the Regional Board a technical report (1) providing an inventory of the remaining catch basins, including their location within the MS4 and relative to the receiving water; (2) detailing the reason that each catch basin cannot be retrofitted with a full capture system, (3) containing an engineering evaluation of whether each catch basin could be retrofitted with a partial capture device, and an engineering evaluation of whether the catch basins are clustered along a particular storm drain and, if so, an evaluation of whether a downgradient full capture system or partial capture device can be installed along the storm drain or at the MS4 outfall.
- The agency prepares and submits to the Regional Board a report which details the partial capture devices and/or institutional controls implemented in the affected subwatershed and includes an assessment of the effectiveness of the partial capture devices and/or institutional controls using existing data and studies representative of the subwatershed or jurisdictional area.
    - Depending on Regional Board evaluation of the assessment of institutional controls and partial capture devices using existing data and studies, the municipality may need to also conduct a special study of institutional controls and partial capture devices in the particular subwatershed(s) where the non-retrofitted catch basins are located.
- The agency re-evaluates the effectiveness of institutional controls and partial capture devices and reports the findings to the Regional Board if significant land use changes occur in the affected subwatershed (based on permits for new and significant re-development) or if there is a significant change in the suite of implemented partial capture devices and/or institutional controls (e.g., reduced frequency of implementation, reduced spatial coverage of implementation, change in technology employed). Because compliance is evaluated on an annual basis, such re-evaluation shall occur within one year of the identification of the significant changes.

Recommendation: Add to the Los Angeles River and Ballona Creek Trash TMDLs the alternative described in the paragraph above for demonstrating full compliance for agencies that are using full capture systems exclusively to achieve their WLAs/WQBELs.

2.2.2 DGR Calculation Requirements

[1] In 22 areas of unincorporated County of Los Angeles, the County of Los Angles has found 68 (out of 4,289) catch basins to be not suitable for full capture systems, allowing for a full capture installation of approximately 98%, overall. Catch basins in each of the 22 areas will allow at least 97% full capture installation.

Currently, MS4 Permittees that have opted to implement the Los Angeles River or Ballona Creek Trash TMDLs using partial capture devices and institutional controls must, each year, calculate a Daily Generation Rate (DGR) from a representative area of their jurisdiction so that they can then calculate their yearly trash discharge to be compared to interim and final WLAs.

DGR is direct measurement of trash deposited in the drainage area during any 30-day period between June 22 and September 22. The formula is as follows:

1. Daily Generation Rate (DGR) = Amount of trash collected in 30-day period / 30 days
2. Storm Event Trash Discharge = Days since last street sweeping from a given storm event x DGR - Amount of trash recovered from catch basins
3. Total Storm Year Trash Discharge = Sum of all storm events that generate precipitation greater than 0.25 inch.

Calculation of a DGR has been required annually to serve as a measure of the effectiveness of source reduction methods including street sweeping, public education, and enforcement, as well as partial capture devices. Annual calculation of a DGR has been important during the years of implementation leading up to the final implementation deadline. During this period, there were phased reductions required by interim WLAs and agencies needed to actively implement increasing numbers of partial capture devices and add or enhance institutional controls to achieve the final WLAs. However, once an agency has demonstrated compliance with its final WLA, it becomes less important to update the DGR annually unless there is a significant change in institutional controls or land use such that the previously calculated DGR is no longer representative. . Similarly, once a responsible agency has determined that it has implemented all the anticipated institutional controls for a particular area, it will be less important to update the agency's DGR annually unless there are significant changes in the institutional controls being implemented.

In summary, once responsible agency has 1) demonstrated compliance with its final WLA, or 2) implemented all anticipated institutional controls in an area and the DGR for that area is not expected to change, then a less frequent DGR calculation is appropriate. Staff proposes that the Los Angeles River Trash TMDL and Ballona Creek Trash TMDL be revised to reduce the frequency of DGR calculation for agencies that have demonstrated compliance, while still requiring a periodic recalculation of the agency's DGR to evaluate the continued effectiveness of the agency's suite of partial capture devices and institutional controls.

Recommendation: Modify both the Los Angeles River and Ballona Creek Trash TMDLs to allow responsible agency that has demonstrated compliance with its final WLA to reduce the frequency of DGR calculation from annually to once every five years as long as there are no reductions in implementation of partial capture devices and institutional controls over the time period and no significant changes in land use that would render the last DGR calculation unrepresentative of current land uses and trash controls within the agency's jurisdiction. Responsible agencies will be required to request Executive Officer concurrence to reduce the frequency of DGR calculation and will be required to report annually on the continued implementation at the same level of partial capture devices and institutional controls and any land use changes that have occurred over the past year.

2.2.3 Scientifically Based Alternative Compliance

In addition, responsible agencies that have opted to implement the Los Angeles River or Ballona Creek Trash TMDL using partial capture devices and institutional controls may demonstrate compliance using an "alternative compliance monitoring program."

The Los Angeles River Trash TMDL Staff Report from the 2007 adoption of the TMDL (LARWQCB, 2007) and the LA County MS4 Permit discuss alternative compliance and state that the Executive Officer may approve alternative compliance monitoring programs other than those described above [for Partial Capture Treatment Systems and Institutional Controls], upon finding that the program will provide a scientifically based estimate of the amount of trash discharged from the MS4.

For example, the City of Los Angeles has completed studies on the effectiveness of the institutional controls that the City has implemented (City of Los Angeles, 2013) and on the effectiveness of the partial capture devices that the City has deployed (City of Los Angeles, 2006). Using the performance estimates from both these studies, in combination with implementation of full capture systems, the City of Los Angeles has calculated its reduction of trash from its baseline load in the Los Angeles River watershed.

Staff proposes that once a responsible agency has determined that, for a particular land use or land area, it has commenced implementation of all anticipated institutional controls for that land use or land area, the agency may conduct a study of the effectiveness of the suite of institutional controls and propose a performance standard to be applied to the suite of institutional controls (e.g., 10% reduction in trash from baseline load). Staff proposes a similar allowance for an agency to conduct a study of the effectiveness of its partial capture device(s) and propose a performance standard to be applied to the device(s). These performance standards could then be used to calculate the agency's trash reduction and determine its compliance with WLAs/WQBELs.

Recommendation: Clarify the Basin Plan Amendment language for both the Los Angeles River and Ballona Creek Trash TMDLs to allow a responsible agency to conduct studies of institutional controls and partial capture devices or demonstrate that existing studies of institutional controls and/or partial capture devices are representative and transferable to the implementing area within the Permittee's jurisdiction. Executive Officer concurrence will be required for the design of the study, and for the use of study results for compliance determination. Proposals for use of study results to determine compliance must include a schedule for repeating aspects of the study to confirm ongoing effectiveness.

2.2.4 DGR Calculation and Effectively 100% Compliance as a Permittee Approaches 100% Reduction from Baseline Trash Load

The DGR is a representative estimate of a daily trash generation rate for a responsible agency's land area. Therefore, the actual amount of trash discharged from the agency's land area to

receiving waters may be higher or lower than estimated. For example, a DGR calculated over one particular 30-day period may be higher or lower than a DGR calculated over a different 30-day period, but will never be less than zero. In addition, a DGR calculated in one particular catchment chosen to be representative may be higher or lower than a DGR calculated in a different catchment, but will never be less than zero. The Total Storm Year Trash Discharge, using the mass balance approach, is also an estimate, as it is calculated by applying the DGR to the rest of the jurisdictional area and summing the total daily trash discharge for all days with precipitation equal to or greater than 0.25 inch. The Total Storm Year Trash Discharge is then compared to the WLAs to determine compliance with the TMDLs.

A responsible agency using a combination of partial capture devices and institutional controls and using DGR and the mass balance approach to calculating its annual trash discharge to determine compliance can accommodate the potential inaccuracy for the interim WLAs by exceeding the required reduction at each interim deadline. That is, an agency can accelerate its implementation of partial capture devices and institutional controls to ensure that, even with variability in the estimation of annual trash discharge, the interim allocation is met. However, when a responsible agency using this combination of partial capture devices and institutional controls approaches 100% reduction from its baseline trash load, the agency cannot exceed the required 100% reduction to ensure compliance.

The Los Angeles River Trash TMDL Staff Report from the 2007 adoption of the TMDL, section VII.A, states that "[t]he final waste load allocation will be considered complied with when the Executive Officer finds that devices or systems and/or institutional controls have removed effectively 100% of the trash from the storm drain system discharge to Los Angeles River or its listed tributaries" (LARWQCB, 2007) [emphasis added].

Due to the variability in the estimation of annual trash discharge using the DGR approach, staff proposes that the demonstration of "effectively 100%" removal of the trash as Permittees using a mass balance approach and the DGR, approach the final WLA of 100% reduction from their respective baseline loads, may be achieved using one of the alternatives described below.

Alternative 1. Within the Effectiveness of a Structural Vortex Separation Systems (VSS)

With this alternative, responsible agency demonstrates that the suite of partial capture devices and/or institutional controls implemented by the Permittee are at least as effective as the Vortex Separation System (VSS) relied on to establish the expected performance of full capture systems in the Los Angeles River Trash TMDL. A 1998 report on the efficiency of a Continuous Deflective Separation (CDS), a type of VSS, demonstrated efficiency of approximately 99% (Allison et al., 1998).

Alternative 2. Within Demonstrated Full Capture System Effectiveness

With this alternative, a responsible agency demonstrates that the suite of partial capture devices and/or institutional controls implemented by the Permittee are at least as effective as adequately sized, operated, and maintained full capture systems installed in a similar land use in the Los Angeles River or Ballona Creek watersheds.

Full capture is defined as follows:

> A full capture system is any 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. The Rational Equation is used to compute the peak flow rate: Q = C x I x A, where Q = design flow rate (cubic feet per second, cfs); C = runoff coefficient (dimensionless); I = design rain fall intensity (inches per hour).

So, even with a full capture system, some trash may enter the MS4, when design capacity is over reached in a greater than one-year, one-hour storm. Because these storms are infrequent, institutional controls are implemented reduce trash available to be washed into the MS4, and some of the trash washed into the MS4 during a one-year, one-hour storm will be retained in the full capture system until it is cleaned out, the actual trash that reaches receiving waters is expected to be small.

Responsible agencies could conduct a study to determine how much trash gets past full capture systems in a particular land use-type area, calculate it as a percentage, and then apply that percentage as an acceptable error rate for partial capture devices/institutional controls.

For example, a hypothetical study of full capture systems in commercial area shows that for every 100 lbs of trash retained, approximately 4 lbs is discharged to the MS4, which is 3.8%. Therefore, a responsible MS4 Permittee must demonstrate a 96.2% reduction of its baseline trash load to demonstrate full compliance with its final WLA.

Alternative 3. Practical Calculation Limit of Partial Capture Devices and Institutional Controls

With this alternative, a responsible agency demonstrates that the suite of partial capture devices and/or institutional controls it is implementing meets the practical limit of calculation of effectiveness of partial capture devices and institutional controls.

Despite the challenge of demonstrating compliance as a responsible agency approaches 100% reduction of trash from its baseline, several MS4 Permittees are achieving and demonstrating very high levels of reduction using the mass balance/DGR calculations.

Table 5 Percent Trash Reduced in Cities in the Los Angeles Watershed using Partial Capture/Institutional Controls for which Compliance Can Be Determined

	Calculated Reduction using Mass Balance DGR Approach (%)	
City	2012-2013 storm year	2013-2014 Storm year
Hidden Hills	99.6	99.8
Monrovia	98.5	99.5
Monterey Park	90.2	97.8
South Pasadena	95.9	98.5
Temple City	94.0	97.1

Even when, in 2012-2013, reductions were as great as 98.5% in Monrovia and 99.6% in Hidden Hills, increases in trash reduction were possible and, in 2013-2014, Monrovia reported a 99.5% reduction and Hidden Hill reported a 99.8% reduction. Hidden Hills has twice reported reductions greater than 99%. Based on the performance of these cities, 99% could be an appropriate practical calculation limit using the mass balance DGR approach for partial capture devices and/or institutional controls.

However, Hidden Hills, a very small residential city with low population density, may not be a representative jurisdiction in terms of land use and population density, and other characteristics of the catchment it uses to calculate its DGR may not be representative of other Permittees' jurisdictional areas. Several cities, more typical in terms of land use and density, have demonstrated compliance above 97%.

Therefore staff concludes that 99% is an appropriate, higher bound, practical calculation limit using the mass balance DGR approach, although, in some cases, 97% may be a more appropriate practical calculation limit. More than two years of data may be necessary to determine an appropriate practical calculation limit for a particular city.

A responsible agency may be able to demonstrate that a practical calculation limit using the mass balance DGR approach for its jurisdictional area is a number at or above 97% and less than 99% with additional data. Any such demonstration would necessarily include:

- Two or more years of data showing that the agency's compliance was at or above a 97% reduction in its baseline trash load;
- An evaluation of institutional controls in the agency's jurisdiction demonstrating their continued effectiveness and any potential enhancements; and
- A demonstration that opportunities to implement partial capture devices have been fully exploited.

Staff proposes Alternative 3 because given that the mass balance DGR method produces an estimate, this alternative demonstrates that *effectively 100% of the trash* is kept out of the MS4 and several cities have demonstrated the achievability of reducing trash to between 1% to 3% of their baseline load.

Recommendation: For both the Los Angeles River and Ballona Creek Trash TMDLs, the TMDLs should be revised to include implementation language deeming an agency in full compliance with its WLA when using the mass balance DGR approach where the reduction of trash from the agency's baseline load is between 99% and 100%. In addition, any agency may request a determination from the Regional Board that the practical calculation limit using the mass balance DGR approach for their jurisdictional area is a number at or above a 97% reduction from the baseline load, where the demonstration includes the data/evaluations identified above.

2.2.5 Operation and Maintenance of Full Capture Systems and Partial Capture Devices

All of the MS4 Permittees complying with the Los Angeles River Trash TMDL or the Ballona Creek Trash TMDL are relying, to a greater or lesser extent, on devices installed in or on catch basins and storm drains. While poorly maintained trash screens and inserts can become blocked, increasing the potential for flooding, poorly maintained devices are also less effective or ineffective, at preventing the discharge of trash from the MS4 to receiving waters. Therefore, operation and maintenance is a key component in ensuring the continued efficiency of full capture systems and partial capture devices. As such, it is important for MS4 Permittees to ensure that these full capture systems and partial capture devices are always functioning properly in order to yield expected water quality and environmental benefits.

The importance of proper operation and maintenance of full capture systems is recognized in MS4 permits. Part VI.E.5.b.i.(1)(c) of the Los Angeles County MS4 Permit and similar provisions of the City of Long Beach MS4 Permit incorporate the requirement for proper operation and maintenance in compliance determination.

> "…attainment of the effluent limitations shall be conclusively presumed for any drainage area… where certified full capture systems treat all drainage from the area, provided that the full capture systems are adequately sized and maintained, and that maintenance records are up-to-date and available for inspection by the Regional Water Board." (emphasis added).

Similarly, where the determination of compliance includes dependence on a calculation of the efficiency of partial capture devices, that determination must also be dependent on the proper operation and maintenance of the partial capture device.

Recommendation: Clarify that for the Los Angeles River Trash TMDL and the Ballona Creek Trash TMDL, compliance determination is dependent on proper operation and maintenance of full capture systems and partial capture trash devices.

2.3 Non-point Sources of Trash

Nonpoint sources are assigned load allocations (LA) in TMDLs. According to the State's Nonpoint Source Policy, load allocations may be addressed by Statewide general waste discharge requirements (WDRs), conditional waivers of WDRs, or individual WDRs among

other implementation mechanisms. Most trash and debris TMDLs in the Los Angeles Region address discharges from nonpoint sources through load allocations to be implemented through either waste discharge requirements or a conditional waiver from waste discharge requirements. In these cases, nonpoint source dischargers may achieve compliance with the load allocations by implementing a minimum frequency of assessment and collection/best management practice (MFAC/BMP) program. The MFAC/BMP program includes an initial minimum frequency of trash assessment and collection and suite of structural and/or non-structural BMPs.

Many recreational land uses, such as parks, campgrounds, and picnic areas, experience considerable littering. In urban areas, recreational areas will generally contribute trash to a waterbody through the MS4; however, when the recreational area is directly adjacent to the waterbody, the trash may enter the waterbody directly or may be transported by wind to the waterbody. There are limited studies to define the relationship between the strength of winds and movement of trash from land surface to a waterbody, but lighter trash with sufficient surface area to sail with wind, such as plastic bags, beverage containers, and paper or plastic convenience food containers are easily lifted, and carried to waterbodies.

In this section, LAs for recreational areas and MFAC/BMP programs for the recreational areas and for the City of Santa Clarita, also assigned a LA, are discussed.

2.3.1 Load Allocations in the Los Angeles River and Ballona Creek Trash TMDLs

The Los Angeles River Trash TMDL includes a load allocation of zero trash discharged, but the entities responsible for implementing the load allocation are not specifically identified. There are numerous parks and other recreational facilities along the Los Angeles River, which may contribute trash to the river, as described above. Staff proposes assignment of the load allocation to responsible entities owning or operating recreational facilities directly abutting the Los Angeles River and its tributaries.

While load allocations for the nonpoint sources of trash to Ballona Creek were not explicitly included in the Ballona Creek Trash Basin Plan Amendment, the load allocations were clarified in a memo from the Regional Board to USEPA Region IX dated July 29, 2002 (LARWQCB, 2002). In this memo, the Regional Board clarified that,

> "…Non-point sources were identified as wind blown trash and direct deposit of trash into the water. Since the numeric target is zero, implicitly both the Load Allocation and the Waste Load Allocation must be zero. This clearly was our intent."

In addition, in the USEPA's letter to the State Water Board approving the Los Angeles River Trash TMDL and the Ballona Creek Trash TMDL, dated August 1, 2002 (USEPA, 2002), states, in the "TMDL Checklist" review of the Ballona Creek Trash TMDL:

> "…Based on the information in the TMDL Report, Basin Plan Amendment, and clarifying letter of July 29, 2002, EPA concludes that the TMDLs include as appropriate wasteload and load allocations which are consistent with the TMDLs and with provisions of the Clean Water Act and federal regulations. The State's TMDL acknowledges the

presence of trash discharges from both point and nonpoint sources. …Therefore, the State has treated the load allocation as a gross allotment accounting for the nonpoint sources of trash discharges…"

While there are few parks or other recreational facilities directly abutting Ballona Creek, there is a trail which goes around the approximately 600-acre Ballona Creek wetlands. Beyond this trail, the Ballona Wetlands are generally closed to the public but wetlands tours are offered by Friends of Ballona Wetlands several times a month along with additional club and school tours. In addition, access to the wetlands is easy through holes in the chain link fence. Therefore, staff proposes to assignment of the load allocation to the California Department of Fish and Wildlife as the operator of the Ballona Wetlands.

By applying a similar land use area concept that was applied to develop the WLAs, the baseline load allocation per year for any designated recreational area is the sum of the products of each land use subarea multiplied by the baseline load allocation for the land use subarea, as shown below:

$$LA = \sum \text{for each Nonpoint source} \left(\text{subarea by land uses} \bullet \text{allocations for this land use} \right)$$

It is appropriate to assume the same trash generation rate or allocation for different types of recreational land uses, in which case: LA = recreational area in square miles • 640 gallons trash.

Trash TMDLs in the Los Angeles Region have used 640 gals of trash per year, per square mile, (based on a study by the City of Calabasas) to assign a baseline trash allocations in all trash TMDLs that did not have an unique baseline study.

The baseline load allocations are used as the basis for the progressive reduction of trash in nonpoint sources. Responsible entities will be required to monitor the trash quantity deposited in defined recreational areas to comply with reductions from the baseline load allocation.

Table 6 Designated Recreational Areas along the Los Angeles River and its Tributaries

Responsible Party	Park/Facility	Approximate Nonpoint Source Area (acres)	Nonpoint Source Area ($miles^2$)	Approximate Baseline Load Allocation (mi^2 x 640 gal/mi^2/yr = gal/yr)
Arcadia Golf Course	Arcadia Golf Course	25.63	0.040	25.63
City of Arcadia	Eisenhower Park	4.69	0.007	4.69
City of Bell Gardens	Ford Park	35.2	0.055	35.2
City of Burbank	Compass Tree Park	0.12	0.000	0.12
City of Burbank	Buena Vista Park	11.2	0.018	11.2
City of Compton	Raymond Street Park	1.73	0.003	1.73
City of Cudahy	Cudahy Park	4.71	0.007	4.71
City of Downey	Treasure Island Park	3.44	0.005	3.44

City of Glendale	Glorietta Park	8	0.013	8
City of Glendale	Dunsmore Park	9.63	0.015	9.63
City of Long Beach	DeForest Park	28	0.044	28
City of Los Angeles	Montecito Rec Center	14.01	0.022	14.01
City of Los Angeles	Hermon Park	1.3	0.002	1.3
City of Los Angeles	Elysian Park	600	0.938	600
City of Los Angeles	Los Feliz Golf Course	15	0.023	15
City of Los Angeles	Valleyheart Greenway	2.36	0.004	2.36
City of Los Angeles	Moorpark Park	2.95	0.005	2.95
City of Los Angeles	Hansen Dam Park	45	0.070	45
City of Los Angeles	Sepulveda Rec Center	10.65	0.017	10.65
City of Los Angeles	Paxton Park (Richie Valens Park)	6.79	0.011	6.79
City of Los Angeles	Sepulveda Basin Recreation Area	2000	3.125	2000
City of Los Angeles	Vanalden Park	5.52	0.009	5.52
City of Los Angeles	Northridge Rec Center	18.56	0.029	18.56
City of Los Angeles	Mae Boyer Rec Center	2.03	0.003	2.03
City of Los Angeles	West Hills Rec Center	14.41	0.023	14.41
City of Los Angeles	Reseda Park & Rec Center	21.17	0.033	21.17
City of Los Angeles	LA River Greenway Park	4.05	0.006	4.05
City of Los Angeles/ Mountains Recreation & Conservation Authority	Marsh Street Park	3.9	0.006	3.9
City of Maywood	Maywood Riverfront Park	5.57	0.009	5.57
City of Montebello	Grant Rea Park	20.7	0.032	20.7
City of Pasadena	Eaton Blanche Park	5.5	0.009	5.5
City of Pasadena	Gwinn Park	2.5	0.004	2.5
City of Pasadena	Lower Arroyo Park	150	0.234	150
City of Pico Rivera	Rio Hondo Park	11.9	0.019	11.9
City of Rosemead	Sally Tanner Park	1.42	0.002	1.42
County of Los Angeles	Whittier Narrows County Golf Course	250	0.391	250
County of Los Angeles	Pamela County Park	3.17	0.005	3.17
County of Los Angeles	Crescenta Valley Park	18.5	0.029	18.5
County of Los Angeles/ Santa Anita Associates	Santa Anita County Golf Course	140	0.219	140
LA Equestrian Center/ City of Los Angeles	LA Equestrian Center	75	0.117	75
Los Angeles County	Wrigley Greenbelt	9.8	0.015	9.8
San Gabriel Country Club	San Gabriel Country Club	105.96	0.166	105.96

In the Ballona Creek Watershed, the single designated recreational area is the Ballona Creek Wetlands. The California Department of Fish and Wildlife is assigned a baseline load allocation based on the approximately 600-acre site, such that the load allocation is approximately 600 gal/year.

In addition, the City of Santa Clarita was previously assigned a baseline WLA of 901 gallons of trash per year. Per Section 2.1.3, the City of Santa Clarita will now be assigned a baseline LA of 901 gallons of trash per year.

Recommendation: The load allocation should be assigned to specific responsible entities that own and/or operate designated recreational areas along the Los Angeles River and its tributaries, as described in Table 6 above, the Ballona Creek Wetland and the City of Santa Clarita. The existing load allocation of zero trash discharged would apply to these entities as well as any entities that may be identified as nonpoint source dischargers in the future.

2.3.2 Conditional Waiver, MFAC/BMPs Compliance for Los Angeles River Trash TMDL and Ballona Creek Trash TMDL

In the near future, Regional Board staff will separately recommend that the Regional Board issue WDRs or a conditional waiver of WDRs to implement the load allocations for trash. A conditional waiver or WDRs provide a regulatory structure whereby continued monitoring and iterative BMPs are deployed to attain zero trash discharged by nonpoint sources according to the TMDL Schedule for Load Allocations, Table 7.

Compliance is based on implementing a program for trash assessment and collection to attain a progressive reduction in the amount of trash discharged to the Los Angeles River or Ballona Creek and Wetlands from nonpoint sources. Responsible entities shall propose a program of Minimum Frequency of Assessment and Collection (MFAC). The MFAC program is required to achieve a progressive reduction in the amount of trash collected from the river or the river's edge through implementation of BMPs. Responsible entities may implement structural or nonstructural BMPs as required to attain a progressive reduction in the amount of trash discharged by nonpoint sources to the Los Angeles River and tributaries.

Nonpoint Source Implementation
Key provisions of the implementation include:

- Baseline Load Allocations
- WDRs or a conditional waiver of WDRs for nonpoint source dischargers who implement MFAC programs; and
- Trash monitoring to provide data to assess effectiveness of BMPs and trash abatement programs, and assess levels of trash

Responsible entities should propose the mitigation measures incorporating an individual method or combinations to progressively reduce nonpoint source discharges of trash. A wide variety of

methods possibly alleviating nonpoint source trash contributions from recreational areas and open spaces to the Los Angeles River and tributaries and Ballona Creek and Wetlands include but are not limited to:

Trash Receptacles

Most of trash disposed of on the ground may result from the lack of trash receptacles. Installing trash receptacles can reduce nonpoint trash loadings. The receptacles should be visible and conveniently reachable. Sufficient trash receptacles in the picnic area should be provided. Receptacles should be equipped with lids to prevent wildlife browsing through or the wind re-mobilizing the trash inside.

Varieties of land uses determine the proper locations and necessary density of the trash receptacles. More receptacles are needed along trails, near park entrances and exits, adjacent to picnic areas or areas with higher activity frequencies. Sanitation should be maintained to avoid nuisances.

Enforcement of Litter Laws

The existing litter laws can be posted in the prominent location for the park users or residents to understand the regulations.

Patrolling or designated personnel should have authorities to illustrate, execute, and enforce the litter laws. The effectiveness of enforcement should be monitored.

Public Education

Public education refers to posting information, giving presentation, or conducting direct or indirect communication with individuals. This outreach can be applied to public entities such as city halls, schools, community centers, senior centers, and to private meeting/activity locations.

The educational materials should include the relevant ordinances, the importance of protecting environment, possible environmental and biological impacts from pollution, and the necessary response if pollution occurs.

Community Involvement

Involving communities may be more effective in promoting the importance of protecting water quality and environment. Communities can organize activities to illustrate that environmental protection involves every individual's continuous efforts.

Reporting System

Patrol personnel, park users, or residents should report accumulation of trash or illegal disposal of trash to the river and its adjacent areas. Information with a toll-free number should be conveniently available near the river for timely reporting. Responsible agencies, after receiving reports, should conduct inspections to formulate proper cleanup actions.

Surveillance Cameras

Surveillance cameras can be installed to monitor the water quality and any illegal disposal that may require immediate cleanup. They can also be used to enforce the littering laws, if necessary.

Tax Benefit by Adopting Waterbodies, Parks, etc.
This concept is adapted from the "Adopt-a-Highway" program. The participation from industries or entities in the vicinity of the river will help the responsible agencies to maintain the cleanliness of the environment, and increase the cleaning frequency. Industries or any entities that contribute resources, time, or efforts to keep the environment clean could be encouraged by having a tax benefit.

Recommendation: Include MFAC/BMP compliance in the Basin Plan Amendment language for the Los Angeles River Trash TMDL and Ballona Creek Trash TMDL and issue a Conditional Waiver of WDRs at a later date.

2.3.3 Nonpoint Source Monitoring for Los Angeles River Trash TMDL and Ballona Creek Trash TMDL

Responsible entities for load allocations should be required to develop a Trash Monitoring and Reporting Plan (TMRP) to be approved by the Executive Officer. The minimum requirement for trash monitoring includes the assessment and quantification of trash collected from the designated recreational areas. The monitoring plan shall provide details on the frequency, location, and reporting of trash monitoring. Responsible entities shall propose a metric (e.g., weight, volume, pieces of trash) to measure the amount of trash in the river, and on adjacent land areas. Responsible entities may include other metrics to provide data for revision of the baseline load allocations, determine effectiveness of BMPs, and assess compliance with the TMDL. Responsible entities may coordinate their trash monitoring activities.

Responsible entities may refine the trash baseline load allocations with the first year of the data collection as approved by the Executive Officer by implementing the approved TMRPs to obtain site-specific trash generation rates.

Recommendation: Include the requirement for a TMRP in the Basin Plan Amendment language for the Los Angeles River and Ballona Creek Trash TMDLs.

2.3.4 Nonpoint Source Schedule for Los Angeles River Trash TMDL and Ballona Creek Trash TMDL

Compliance is assessed in accordance with responsible entities' implementation of MFAC and BMPs and attainment of the progressive trash reductions in accordance with the schedule below. Note that these parks and other recreational areas already manage trash on their facilities and many will already have implemented trash control BMPs.

Table 7 Schedule for Implementation of Load Allocations*

Task No.	Task	Date
1	Baseline Load Allocations in Effect	Effective date of the reconsideration of the Los Angeles River and Ballona Creek Trash TMDLs
2	Submit Minimum Frequency Assessment and Collection (MFAC) Program Plan	Upon enrollment in Conditional Waiver or WDR for trash
4	Achieve 100% reduction of trash from baseline load allocations	Three years from effective date of the reconsideration of the Los Angeles River and Ballona Creek Trash TMDLs

*The implementation deadline for the LA assigned to the City of Santa Clarita is September 30, 2016 per the schedule for implementation of WLAs, since the City's LA was previously identified as a WLA.

Recommendation: Compliance should be assessed in accordance with responsible entities' implementation of MFAC and BMPs and attainment of the progressive trash reductions in accordance with the schedule in Table 7.

2.3.5 Cost Considerations – MFAC

This section provides an estimate of costs to comply with the Minimum Frequency of Assessment and Collection program for nonpoint source responsible jurisdictions. The cost estimate is based on the minimum frequency of assessment, collection (including cleanup after critical conditions) and evaluation monitoring recommended in section 2.3.3.

It is assumed that the personnel for trash assessment and collection will be employed by one of the responsible entities that provide services to the nonpoint source area. As such, equipment and vehicles are available and costs for these items are assumed to be included in the estimate below. It is also assumed that a single person can conduct the complete critical conditions clean up in eight hours per event, and the morning trash assessment and afternoon evaluation in two hours per event.

An estimation of the total number of hours per year to implement critical conditions cleanup events is provided below. Critical conditions take into account the 27 weekends between April 15 and October 15, plus four major storms. These 31 critical conditions can be directly applied to each monitoring site listed in Table 6, the Ballona Creek Wetlands and the open space of Santa Clarita. Assuming eight hours per event, the total number of 5,704 hours is estimated.

Table 8 Estimated Critical Condition hours of Implementing Minimum Frequency of Assessment and Collection Program per Monitoring Location

Critical Conditions (per year)	Hours per Event	Total Hours
31	8	248

The cost for these entities to comply with the MFAC program will not include the current routine maintenance schedules, and will only include the additional costs of trash compliance assessment and evaluation. The estimated hours needed to conduct assessment, collection, and evaluation events per monitoring location that are required are summarized below, with a total of 552 hours.

Table 9 Estimated Assessment, Collection, and Evaluation hours of implementing MFAC program

MFAC Description per monitoring location	MFAC (per year)	Hours per Event	Total Hours
Assessment once per month immediately following cleanup event.	12	2	24

The costs per year to implement the Los Angeles River and Ballona Creek Trash TMDLs are summarized below. Assuming a burdened hourly rate of $37.50 per hour, the estimated annual costs to conduct the Minimum Frequency of Assessment and Collection program is approximately $10,200/yr/monitoring location. For 42 sites in Table 6 and the Ballona Creek Wetlands and the open space of the City of Santa Clarita, the total cost is approximately $448,800 per year.

Table 10 Estimated costs per year of implementing MFAC Program per Monitoring Location

Critical Condition Hours/yr	Assessment and Collection Hours/yr	Total Hours/yr	Rate	Total Cost/yr
248	24	272	$37.50	$10,200

2.4 Pre-production Plastic Pellets

Pre-production plastic pellets, also known as nurdles, are very small (usually < 5 mm) plastic beads that are melted down to make plastic objects. As a result of their tiny size, these plastic pellets are easy to transport in bulk (via railway and trucks). Through accidental spills during

transport, transfer, or processes within industrial facilities, these plastic pellets can make their way into MS4s, onto local beaches, and ultimately into the ocean.

Birds, fish, and mammals often mistake plastic pellets for food. With plastic filling their stomachs, animals have a false feeling of being full, and may die of starvation. Smaller elements such as pre-production plastic pellets are often more harmful to aquatic life than larger plastic elements, since they can be ingested by a large number of small organisms, which can then suffer malnutrition or internal injuries. In addition to malnutrition, plastic pellets may contain chemicals that are toxic (e.g. persistent organic pollutants). These toxic substances may be additives that were intentionally mixed into the resin to achieve specific properties, or contaminants that were adsorbed by the pellets from the environment (U.S. EPA, 1992).

Pre-production plastic pellets in waterways can cause other significant water quality problems. Pellets that sink may inhibit the growth of aquatic vegetation, decreasing spawning areas and habitats for fish and other living organisms. Plastic pellets that settle at the bottom can also contribute to sediment contamination (U.S. EPA, 1992).

Assembly Bill (AB) 258, which became effective January 1, 2008, added section 13367 to Division 7 of the California Water Code, entitled "Preproduction Plastic Debris Program." This section of the Water Code applies to facilities in California that manufacture, handle, or transport preproduction plastics, the raw materials used to produce plastic products.

2.4.1 Plastic Pellets in Los Angeles Region Trash TMDLs

Pre-production plastics have been addressed in a recent Los Angeles Region trash TMDL, the Santa Monica Bay Nearshore and Offshore Debris TMDL (R10-010) (LARWQCB, 2010). MS4 permittees subject to the Ballona Creek Trash TMDL are already addressing plastic pellets, as these jurisdictions are identified as responsible jurisdictions in the Santa Monica Bay Debris TMDL, which includes a requirement for MS4 permittees to monitor and report discharges of plastic pellets from their MS4s. Staff proposes adding this plastic pellet monitoring requirement to the Los Angeles River Trash TMDL.

2.4.2 Plastic Pellet Impairments in the Los Angeles River and Ballona Creek

Several studies have investigated the presence of plastics in the waters off of southern California. Plastic pellets, polystyrene, hard plastic fragments, thin films, and line have all been documented in the Santa Monica Bay. A study conducted by the Algalita Marine Research Foundation (AMRF) conducted sampling at two Santa Monica Bay sites offshore of Ballona Creek, and found that plastics were present not only at surface levels, but also in mid-water depths, and at the bottom of the Santa Monica Bay (Lattin et al., 2004).

Another study conducted by AMRF examined the quantity and type of plastic debris flowing from the Los Angeles River and San Gabriel River to the beaches, and ultimately the ocean. Out of the different categories of plastic found in the Los Angeles River, pre-production plastic pellets had the greatest density. Plastic pellets were the second most abundant material found after expanded polystyrene in the Los Angeles River (Moore et al., 2011).

In addition to studies completed offshore of Ballona Creek and in the Los Angeles River, AMRF is also leading a study with the Southern California Coastal Water Research Project (SCCWRP) and other agencies to investigate plastic pollution in the Southern California Bight. This study is investigating plastic ingestion by fish, in addition to benthic plastics found on the ocean floor. The results of this study will be released by SCCWRP in 2015 as part of the California Bight Study.

Plastic pellets have been found along many beaches in the Southern California Bight. A more localized study conducted in the summer of 1998 by SCCWRP examined the composition and distribution of beach debris on Orange County beaches. The study found over 105 million pre-production plastic pellets, weighing more than 4,700 pounds (Moore, 2000).

2.4.3 Sources of Plastic Pellets

Like trash, the pre-production plastic pellets can reach storm drains, which lead to the Los Angeles River, and then the Pacific Ocean. Plastic pellets are transported by ships, trucks, and trains from plastic manufacturers to plastic industries. Once discharged, the pellets are easily blown by wind or carried by stormwater through the storm drain system and to the beaches and ocean. As a result of their very small size, plastic pellets are not captured by most trash capture devices. Studies in New York, Boston, and Houston showed that combined sewer overflows and storm drains were sources of pellets in the aquatic environment (U.S. EPA, 1992).

According to the American Chemistry Council (ACC) Plastics Industry Producers' Statistics (PIPS) Group, U.S. resin production was 107.5 billion pounds in 2013. Industries that manufacture, store, process, and otherwise handle plastic pellets as raw material are sources of pellets in the environment. Although the plastic pellets ultimately make their way to the beaches and ocean through storm drain systems, they originate on the premises of the plastic industries, and discharges from these facilities are regulated through separate regulatory mechanisms. When industries release plastic pellets onto the ground and adjacent areas of the site, they are responsible for ensuring that the plastic pellets are not transported off-site via runoff and stormwater.

Although plastic industries are the primary point source for plastic pellets, it is likely that any spills that happen during transport, transfer, or handling release plastic pellets to the MS4 and eventually the ocean. Any such spills will be addressed by the previously mentioned land based point source of plastic pellets or the MS4 Permittees.

MS4 Permittees subject to the Ballona Creek Trash TMDL are already addressing plastic pellets, as these jurisdictions are identified as responsible jurisdictions in the Santa Monica Bay Debris TMDL, which includes a requirement for MS4 Permittees to monitor and report discharges of plastic pellets from their MS4s. Therefore, a plastic pellet monitoring requirement is only proposed for addition to the Los Angeles River Trash TMDL. Plastic pellet requirements in the Los Angeles River Trash TMDL will be consistent with existing plastic pellet requirements in the Santa Monica Bay Debris TMDL.

Industries

Industrial facilities that import, manufacture, process, transport, store, recycle or otherwise handle plastic pellets are subject to California Water Code section 13367 and section 122.26(b)(12) of Title 40 of the Code of Federal Regulations.

California Water Code section 13367 establishes a requirement to eliminate discharges of pre-production plastics and that requirement is being implemented through the Statewide Industrial Storm Water General Permit (Order No. 97-03-DWQ and NPDES Permit No. CAS 000001 expiring June 30, 2015; and 2014-0057-DWQ and NPDES Permit No. CAS 000001 effective July 1, 2015) (IGP) and other stormwater permits. Due to the implementation through the IGP, staff do not recommend load allocation be assigned for industrial facilities. This is consistent with the approach in the proposed State Trash Amendments.

The Standard Industry Classification (SIC) codes associated with industrial activities involving plastic pellets may include, but are not limited to, 282X, 305X, 308X, 39XX, 25XX, 3261, 3357, 373X, and 2893. Additionally, industrial facilities with the term "plastic" in the facility or operator name, regardless of the SIC code, may be subject to the provisions of California Water Code section 13367 and section 122.26(b)(12) of Title 40 of the Code of Federal Regulations. Other industrial permittees within the Los Angeles River Watershed that fall within the above categories, but are regulated through other general permits and/or individual industrial storm water permits, may also be required to control plastic pellets.

Industries must comply with the IGP or other general or individual industrial permits, which require a Stormwater Pollution Prevention Plan (SWPPP) to be prepared and kept onsite at all times. The SWPPP should address the areas where pellets tend to spill, as well as an overall plan to keep plastic pellets from being released off of the premises. The SWPPP shall incorporate structural and nonstructural BMPs that are implemented to keep pellets on site, including specific practices that are used to clean up incidental or large spills.

Industrial permittees my comply with the requirements of the IGP by using best management practices such as appropriate containment systems, sealed containers, vacuum devices for cleaning, and frequent inspection and cleaning at operational areas and outlets of water discharge, to effectively control and prevent discharges of pre-production plastics pellets. In addition, necessary best management practices shall be exercised to eliminate spillage of plastic pellets during transportation that could be later mobilized and transported to waters of the State.

MS4s

MS4s may be a point source for plastic pellets to the Los Angeles River and tributaries. MS4 Permittees in the Los Angeles River Watershed should be required to monitor for plastic pellets. MS4 Permittees in the Los Angeles River Watershed shall either prepare a Plastic Pellet Monitoring and Reporting Plan (PMRP), or demonstrate that a PMRP is not required as described, below. The PMRP will serve to (1) monitor the amount of plastic pellets being discharged from the MS4 at critical times and locations, (2) establish triggers for a possible need to increase industrial facility inspections and enforcement of SWPPP requirements for industrial facilities having Standard Industry Classification (SIC) codes associated with industrial activities involving plastic pellets, as listed above, or industrial facilities with the term "plastic" in the

facility or operator name, regardless of the SIC code, and (3) address possible plastic pellet spills. In the event of a plastic pellet spill, the Regional Board shall be notified by the agency or jurisdiction within 24 hours of the responsible agency or jurisdiction becoming aware of the spill. The PMRP shall include protocols for a timely and appropriate response to possible plastic pellets spills within their jurisdictional area, and a comprehensive plan to ensure that plastic pellets are contained.

MS4 Permittees will fall into one of the following three categories for requirements of a PMRP:

1. MS4 Permittees that have industrial facilities or activities related to the manufacturing, handling, or transportation of plastic pellets within their jurisdiction must prepare a PMRP.

2. Responsible jurisdictions that have no industrial facilities or activities related to the manufacturing, handling, or transportation of plastic pellets may not be required to conduct monitoring at MS4 outfalls, but must have a response plan in place to address plastic pellet spills. If satisfactory documentation is provided that shows there are no industrial facilities or activities related to plastic pellets within the jurisdiction, the responsible jurisdiction may be excused of the requirement to monitor MS4 outfalls. LACFCD will be in this category.

3. Responsible jurisdictions that only have residential areas within their respective jurisdictions, and have limited commercial or industrial transportation corridors (including railways and roadways), may be exempted from the requirements of preparing a PMRP. In order for a responsible jurisdiction to be exempted from this requirement, sufficient documentation including municipal zoning plans must be submitted to the Regional Board and approved by the Executive Officer.

If a jurisdiction changes its zoning and land use plans, or issues operating licenses to industries that import, manufacture, process, transport, store, recycle, or otherwise handle plastic pellets within its jurisdiction, then it must submit a PMRP within 90 days of the above actions.

Recommendation: The Los Angeles River Trash TMDL should be made consistent with the requirements of the Santa Monica Bay Debris TMDL (which includes the Ballona Creek watershed) by incorporating a requirement for MS4 Permittees to submit PMRPs for plastic pellets as described above.

2.4.4 Plastic Pellet Monitoring

MS4 permittees should submit a Plastic Pellet Monitoring and Reporting Plan that will address monitoring of plastic pellets at outfalls in the MS4 under their respective jurisdictions.

In the alternative, responsible jurisdictions may propose additions to their Integrated Monitoring Program (IMP) or Coordinated Integrated Monitoring Program (CIMP) under the Los Angeles County and Long Beach MS4 Permits.

The PMRP will be submitted to the Regional Board according to the TMDL Implementation Schedule as revised by this reconsideration. The Regional Board's Executive Officer will have full authority to review, revise, approve, or disapprove the PMRPs.

Data Collection
Because the amount of plastic pellets deposited into the Los Angeles River and tributaries through MS4s may depend on rainfall patterns, monitoring will include events at a minimum of once in the rainy season and once in the dry season every year. The rainy season is defined as the period from October 15 to April 15.

Unit of Measure
The amount of plastic pellets discharged at MS4 outfalls shall be reported in a single unit of measure. The responsible agencies may select the unit. The unit of measure will be used to establish triggers for the possible need for increased industrial facility inspections and enforcement of SWPPP requirements for industrial facilities.

Disposal of Collected Plastic Pellets
Plastic pellets captured during monitoring must be disposed of in accordance with all applicable laws and regulations.

Location
Plastic pellets will be monitored at MS4 outfalls within the Los Angeles River watershed where industrial Permittees, as described above, are located.

Recommendation: The Los Angeles River Trash TMDL should be made consistent with the requirements of the Santa Monica Bay Debris TMDL (which includes the Ballona Creek watershed) by incorporating a requirement for MS4s to monitor for plastic pellets as described above.

2.4.5 Cost Considerations – Plastic Pellet Monitoring

In order to comply with the Los Angeles River Trash TMDL, MS4 permittees must implement a Regional Board Executive Officer-approved Plastic Pellet Monitoring and Reporting Plan. MS4 permittees will conduct plastic pellet monitoring at critical MS4 outfalls to be identified. Critical MS4 outfalls do not need to be identified for areas for which PMRPs do not need to be developed. This section estimates the cost of monitoring at approximately 100 MS4 outfalls along the Los Angeles River and tributaries.

MS4 permittees will monitor each of the MS4 outfalls twice per year (one dry event, and one wet event per year). Assuming that each event takes one staff person four hours to conduct at a burdened hourly rate of $37.50 per hour, the total cost of implementing PMRPs in the Los Angeles River watershed is $30,000 per year.

Table 11 Estimated costs of implementing the plastic pellet monitoring and reporting plan

Monitoring Events per Year	Hours per Event	Rate	Total Cost per Year
=2*100 storm drains	4	$37.50	$30,000

2.5 Receiving Water Monitoring

Assessment and monitoring are key components of TMDLs. At the time of the development of the Los Angeles River and Ballona Creek Trash TMDLs, no standard method for trash assessment was in use and, consequently, neither the Los Angeles River Trash TMDL nor the Ballona Creek Trash TMDL included receiving water monitoring.

Furthermore, while it appears that great progress has been made by MS4 permittees in preventing trash from entering the Los Angeles River and Ballona Creek from the MS4, staff, and stakeholders, cannot objectively assess the degree of improvement in the River or the Creek. The goal of receiving water monitoring for trash is to be able to evaluate the status of trash in the River or the Creek, themselves, and to be able to evaluate the effectiveness, and continued effectiveness, of implementation actions.

Monitoring activities and results, including implementation and effectiveness of BMP implementation, should be reported and submitted to the Regional Board on an annual basis. Receiving water monitoring as discussed in this section shall be conducted by MS4 Permittees.

This section discusses the receiving water monitoring only. Compliance with the TMDL WLAs for point sources through full capture systems, partial capture devices, and institutional controls are addressed in the previously adopted Basin Plan amendments, Resolution Nos. 2001-014 and 2007-012. Compliance and monitoring required for TMDL load allocations for nonpoint sources is discussed in Section 2.4 of this Staff Report, Non-Point Sources.

Responsible agencies should be required to propose and implement a Trash Monitoring and Reporting Plan (TMRP) to be approved by the Executive Officer. The Regional Board's Executive Officer will have full authority to review the monitoring plan(s), to modify the plan, to select among the alternate monitoring sites, and to approve or disapprove the plan(s). Responsible agencies can report receiving water monitoring through a separate TMRP annual report or in conjunction with annual reporting under MS4 permits.

The receiving water monitoring program describes the methodologies that will be used to assess and monitor trash in the Los Angeles River and tributaries and Ballona Creek. Regional Board staff finds that monitoring protocols prescribed by the Rapid Trash Assessment are appropriate for this TMDL (Attachment B). Elements of the receiving water monitoring plan are described below:

A. Monitoring Plan: Responsible jurisdictions will submit a TMRP with the proposed receiving monitoring sites and at least two additional alternate monitoring locations. The TMRP must include maps of the drainage and storm drain data, and locations where trash

accumulates in the waterbody. Trash monitoring shall focus on visible trash at representative and critical locations. Locations for trash assessment shall include, but not be limited to locations where trash enters and exits each reach/segment and their tributaries, and areas of recreational access.

B. Sampling Site and Frequency: The TMRP shall detail the monitoring frequency, number and location of sites, including at least one monitoring station per each river segment, reach, and tributary. Each sampling evaluation should consider trash levels over time and under different seasonal conditions. Sampling assessment every year shall be repeated at the same site where trash was collected during previous assessment to determine trash accumulation rates. Responsible agencies should consider trash assessment before and after community clean up events.

C. Site definition: Site definition shall follow the Rapid Trash Assessment Protocol. A 100-foot section of the stream shall be identified for trash collection/assessment. Site characteristic shall also be defined as provided in the protocol and shall be used to facilitate the comparison of trash assessments conducted at the same site at different times of the year.

D. Trash Assessment/Survey: All trash items within an assessed site shall be picked up and recorded so that the site can be revisited and reassessed for impairment and usage pattern. Trash assessment/survey at the site shall follow the Rapid Trash Assessment protocol including notes and scoring of trash at the site.

E. Trash Assessment Parameters: Rapid trash assessment includes a range of six parameters that capture the breadth of issues associated with trash and water quality. The first two parameters focus on qualitative and quantitative levels of trash, the second two parameters estimate actual threat to water quality, and the last two parameters represent how trash enters the water body at a site, either through on-site activities or downstream accumulation.

1. Level of Trash. This assessment parameter is intended to reflect a qualitative "first impression" of the site, after observing the entire length of the reach. Sites scoring in the "poor" range are those where trash is one of the first things noticeable about the waterbody. No trash should be obviously visible at sites that score in the "optimal" range.

2. Actual Number of Trash Items Found. Based on the tally of trash along the 100-foot stream reach, total the number of items both above and below the high water line, and choose a score within the appropriate condition category based on the number of tallied items. Where more than 100 items have been tallied, assign the following scores: 5: 101-200 items; 4: 201-300 items; 3: 301-400 items; 2: 401- 500 items; 1: 501-600 items; 0: over 600 items. Use similar guidelines to assign scores in other condition categories.

Sometimes items are broken into many pieces. Fragments with higher threat to aquatic life such as plastics should be individually counted, while paper and broken glass, with lower threat and/or mobility, should be counted based on the parent item(s). Broken glass that is scattered, with no recognizable original shape, should be counted individually. The judgment of whether to count all fragments or just one item also depends on the potential exposure to downstream fish and wildlife, and waders and swimmers at a given site. Concrete is trash when it is dumped, but not when it is placed. Consider tallying only those items that would be removed in a restoration or cleanup effort.

3. Threat to Aquatic Life. Certain characteristics of trash make it more harmful to aquatic life. If trash items are persistent in the environment, buoyant (floatable), and relatively small, they can be transported long distances and be mistaken by wildlife as food items. Larger items can cause entanglement. Some discarded debris may contain toxic substances. All of these factors are considered in the narrative descriptions in this assessment parameter.

4. Threat to Human Health. This category is concerned with items that are dangerous to people who wade or swim in the water, and with pollutants that could accumulate in fish in the downstream environment, such as mercury. The worst conditions have the potential for presence of dangerous bacteria or viruses, such as with medical waste, diapers, and human or pet waste.

5. Illegal Dumping and Littering. This assessment category relates to direct placement of trash items at a site, with "poor" conditions assigned to sites that appear to be dumping or littering locations based on adjacent land use practices or site accessibility.

6. Accumulation of Trash. Trash that accumulates from upstream locations is distinguished from dumped trash by indications of age and transport. Faded colors, silt marks, trash wrapped around roots, and signs of decay suggest downstream transport, indicating that the local drainage system facilitates conveyance of trash to water bodies, in violation of clean water laws and policies.

F. Rapid Trash Assessment

Trash assessment shall include a visual survey of the waterbody (e.g., streambed and banks) and adjacent areas from which trash can be carried to the waterbody by wind, water, or gravity. The delineation of these adjacent areas is site-specific and requires some judgment and documentation. The rapid trash assessment worksheet shall be prepared and designed to represent the range of effects that trash has on the physical, biological, and chemical integrity of water bodies, in accordance with the goals of the Clean Water Act and the California Water Code. The worksheet should also provide a record for evaluation of the management of trash discharges, by documenting sites that receive direct discharges (i.e., dumping or littering) and those that accumulate trash from upstream locations.

2.5.1 Cost Considerations – Receiving Water Monitoring

Monitoring with a team of no less than two people may take one or two hours depending on the number of people participating in the monitoring (SFRWQCB, 2004). Initial assessments may take longer to gain familiarity with reach and method. Assuming that each reach, sub-reach, or tributary is monitored twice per year, Los Angeles River Watershed would be monitored roughly 36 times per year in the receiving water and Ballona Creek Watershed would be monitored roughly 10 times per year in the receiving water, totally 144 hours and 40 hours to monitor annually per respective watershed. With a burdened hourly rate of $37.50 per hour, the cost to implement the TMRP in Los Angeles River Watershed is $5,400 and $1,500 for Ballona Creek Watershed.

Table 12 Estimated costs of implementing receiving water monitoring Los Angeles River

Monitoring Events per Year	Hours per Event	Rate	Total Cost per Year
=2*18 reaches	2	2 * $37.50	$5,400

Table 13 Estimated costs of implementing receiving water monitoring Ballona Creek

Monitoring Events per Year	Hours per Event	Rate	Total Cost per Year
=2* 5 reaches	2	2 * $37.50	$1,500

Recommendation: Add a requirement for receiving water monitoring to the Los Angeles and Ballona Creek Trash TMDLs as described above.

3 References

Allison, R.A., Walker, T.A., Chiew, F.H.S., O'Neill, I.C., and McMahon, T.A. (1998). From Roads to Rivers, Gross Pollutant Removal From Urban Waterways. Cooperative Research Centre for Catchment Hydrology.

American Chemistry Council (2015). American Chemistry Council Production and Sales Data by Resin, 2013 vs. 2012. Retrieved from http://www.americanchemistry.com/Jobs/EconomicStatistics/Plastics-Statistics.

City of Los Angeles (2013). City of Los Angeles, prepared by Black and Veatch. Quantification Study of Institutional Measures for Trash TMDL Compliance, 2012 – 2013, pp.444.

City of Los Angeles (2006). City of Los Angeles, Bureau of Sanitation. Technical Report: Assessment of Catch Basin Opening Screen Covers, pp 26.

Eriksen, M., Lebreton, L.C.M., Carson, H.S., Thiel, M., Moore, C.J., Borerro, J.C., Galgani, F., Ryan, P.G., and Reisser, J. (2014). Plastic Pollution in the World's Oceans: More than 5 Trillion Plastic Pieces Weighing over 250,000 Tons Afloat at Sea. Published online Dec 10, 2014. 10.1371/journal.pone.0111913

LARWQCB, 2001b (2001). Los Angeles Regional Water Quality Control Board. Los Angeles River Watershed Trash TMDL Staff Report.

LARWQCB, 2001 (2001). Los Angeles Regional Water Quality Control Board. Attachment A to Resolution No. 01-014. Amendment to the Water Quality Control Plan - Los Angeles Region for the Ballona Creek Trash TMDL.

LARWQCB, 2002 (2002). Letter dated July 29, 2002 addressed to David Smith, USEPA Region IX, signed by Jonathon Bishop, Executive Officer, Los Angeles Regional Water Quality Control Board.

LARWQCB, 2004a (2004). Los Angeles Regional Water Quality Control Board. Attachment A to Resolution No. 04-023. Amendment to the Water Quality Control Plan - Los Angeles Region Ballona Creek Trash.

LARWQCB, 2004b (2004). Los Angeles Regional Water Quality Control Board. Trash Total Maximum Daily Loads for the Ballona Creek and Wetlands Staff Report.

LARWQCB, 2007a (2007). Los Angeles Regional Water Quality Control Board. Attachment A to Resolution No. 07-012. Amendment to the Water Quality Control Plan – Los Angeles Region to incorporate the TMDL for Trash in the Los Angeles River Watershed.

LARWQCB, 2007b (2007). Los Angeles Regional Water Quality Control Board. Los Angeles River Watershed Trash TMDL Staff Report.

LARWQCB, 2010a (2010). Los Angeles Regional Water Quality Control Board. Attachment A to Resolution No. R10-010. Amendment to the Water Quality Control Plan – Los Angeles Region to incorporate the TMDL for Debris for Nearshore and Offshore Santa Monica Bay.

LARWQCB, 2010b (2010). Los Angeles Regional Water Quality Control Board. Staff Report. Debris TMDL for Nearshore and Offshore Santa Monica Bay.

Lattin, G.L., Moore, C.J., Zellers, A.F., Moore, S.L., and Weisberg, S.B. (2004). A comparison of neustonic plastic and zooplankton at different depths near the southern California shore, Marine Pollution Bulletin, 49(4), 291-294.

Midbust, J., Mori, M., Richter, P., Vosti, B., Booth, D. (2014). Reducing Plastic Debris in the Los Angeles and San Gabriel River Watersheds. Bren School of Environmental Science & Management, University of California, Santa Barbara.

Moore, C.J., Moore, S.L., Leecaster, M.K., and Weisberg, S.B. (2001). A comparison of plastic and plankton in the north Pacific central gyre. Marine Pollution Bulletin, 42(12), 1297-1300.

Moore, C.J., Moore, S.L., Weisberg, S.B., Lattin, G.L., and Zellers, A.F. (2002). A comparison of neustonic plastic and zooplankton abundance in southern California's coastal waters. Marine Pollution Bulletin, 44, 1035-1038.

Moore, C.J., Lattin, G.L., Zellers, A.F. (2011). Quantity and type of plastic debris flowing from two urban rivers to coastal waters and beaches of Southern California. Journal of Integrated Coastal Zone Management, 11(1), 65-73.

Moore, S.L., Gregorio, D., Carrion, M., Weisberg, S.B., and Leecaster, M.K. (2001). Composition and distribution of beach debris in Orange County, California. Marine Pollution Bulletin, 42, 241-245.

San Francisco Regional Water Quality Control Board (SFRWQCB) (2004). Rapid Trash Assessment Protocol. *Rapid Trash Assessment Methodology, Version 8.* Surface Water Ambient Monitoring Program.

Stevenson, C. (2011). Plastic Debris in the California Marine Ecosystem: A Summary of Current Research, Solution Strategies and Data Gaps. University of Southern California Sea Grant. Synthetic Report. California Ocean Science Trust, Oakland, CA.

SWRCB (2014). State Water Resources Control Board. Amendment to the Water Quality Control Plan for the Ocean Waters of California to Control Trash and Part 1 Trash Provisions of the Water Quality Control Plan for Inland Surface Waters, Enclosed Bays, and Estuaries of California. Proposed Final Staff Report Including the Substitute Environmental Documentation. pp. 338.

US Environmental Protection Agency (US EPA) (1992). Plastic Pellets in the Aquatic Environment: Sources and Recommendations. Washington D.C. EPA 842-B-92-010.

US Environmental Protection Agency (US EPA) (2002) Letter dated August 1, 2002 addressed to Ms. Celeste Cantu, Executive Director State Water Resources Control Board, signed by Alexis Strauss, Director Water Division, USEPA Region IX.