

BASMAA

Tracking California's Trash Project

**Project Assessment and Evaluation Plan
State Water Resources Control Board Grant Agreement
No. 12-420-550**

Prepared for:

The Bay Area Stormwater Management Agencies Association (BASMAA)

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1. Project Summary

1.1. Funding Program

The Tracking California's Trash (TCT) project is supported by the Proposition 84¹ Stormwater Planning and Monitoring Program. Matching funds are provided via in-kind staff support by the Bay Area Stormwater Management Agencies Association (BASMAA), 5 Gyres Institute, San Francisco Estuary Partnership (SFEP), and the City of Los Angeles and other participating municipalities.

1.2. Project Description and Problem Statement

The TCT project will improve the collective knowledge of municipal stormwater program agencies and regulators regarding California's trash problems and the actions regulators, public agencies, and the concerned public can take to effectively resolve these problems. Project outputs include the development of monitoring methods, an assessment of effectiveness and cost/benefits of specific trash reduction strategies, and the development of a web-based portal that disseminates related information and recommendations to the public.

The TCT project is comprised of three major tasks:

1. Developing Trash Trends Monitoring Methods:
 - a. Receiving Water Trash Flux Monitoring Methods
 - b. Stormwater Conveyance System Monitoring Methods
2. Evaluating the Effectiveness and Costs of Trash Control Measures
3. Developing a Web-based Portal to Disseminate Related Information

The State Water Resources Control Board (State Water Board) has placed a high priority on the development and adoption of Total Maximum Daily Loads (TMDLs), National Pollutant Discharge Elimination System (NDPES) permit requirements, and a statewide Trash Amendment to the Water Quality Control Plan for Inland Surface Waters, Enclosed Bays, and Estuaries of California – all intended to significantly reduce trash in California's freshwater creeks, rivers, lakes, and estuaries, and the Pacific Ocean. The TCT Project Monitoring Plan shows the Bay Area and Los Angeles region 303(d) listed water bodies that are impaired because of trash impacts (see Figure 1 and Figure 2 of the TCT Monitoring Plan).

To date:

- The Los Angeles Regional Water Quality Control Board has adopted, and the State Water Board has approved, trash TMDLs for the Los Angeles River, Ballona Creek, San Gabriel Creek, Malibu Creek, Ventura River Estuary, Lake Elizabeth, Muna Lake, Lake Hughes, Legg Lake, Machado Lake, Revlon Slough, and Beardsley Wash.

¹ Safe Drinking Water, Water Quality and Supply, Flood Control, River and Coastal Protection Bond Act of 2006.

- The San Francisco Bay Regional Water Quality Control Board adopted a regional Phase I NPDES permit in 2009 that requires 76 permitted municipalities to reduce trash discharged from stormwater conveyances. The next iteration of this permit is expected in 2014-2015.
- The Phase II NPDES permit for small municipal dischargers will likely be amended in response to the forthcoming statewide Trash Amendment to also include trash reduction requirements for small municipal separate storm sewer systems (MS4s) throughout the state.

All of these regulatory actions require significant reductions in trash discharged from MS4s over the next decade. They primarily require municipalities to develop strategies to reduce trash in stormwater discharges. Although approaches differ, as a first step, municipalities have developed estimates of baseline trash loads from stormwater conveyance systems and begun to implement enhanced stormwater control measures in the Los Angeles and San Francisco Bay regions. Information on the costs and benefits of these best management practices (BMPs), however, is limited; monitoring methodologies needed to accurately measure progress towards TMDL and NPDES permit reduction goals have not been developed. To date, municipalities have selected trash control measures based on limited available information on effectiveness and implementation costs and have predicted stormwater trash-load reductions developed through limited local studies and literature reviews. Routine and reproducible monitoring methods are needed to measure trash reductions from stormwater conveyances, and robust data on the effectiveness and costs of high priority trash control measures remains an information need.

Additionally, as members of the public have become more aware of trash as a public nuisance and environmental problem, creek cleanup events are often well attended in many municipalities. However, currently no single clearinghouse or web portal exists that aggregates information about trash, what members of the public can do to reduce trash in our receiving waters, and the progress that California is making to reduce trash loads to the environment. The Bay Area Trash Tracker, developed by the San Francisco Estuary Partnership with federal stimulus funds, will be expanded to include hotspots, cleanup locations, trash generation zones, and other improvements to be determined. Information in the upgraded Tracker will inform a new trash portal, compatible with the California Water Quality Monitoring Council's question-based My Water Quality portals as well as existing statewide data systems, including the California Surface Water Ambient Monitoring program (SWAMP) and the associated California Environmental Data Exchange Network (CEDEN), will greatly enhance the public's ability to understand and track our progress in cleaning up trash in California's creeks, rivers and lakes.

1.3. Project Activities or Tasks and Major Categories

Project activities and associated major PAEP categories are shown in Table 1.

Table 1: Project Activities or Tasks as they Relate to Major PAEP Categories

Major PAEP Category	Project Activity or Task
Planning, Research, Monitoring and Assessment	<p><u>Task 1:</u> Project Management and Administration</p> <p><u>Task 2:</u> Develop a Monitoring Plan (MP). The MPs shall: 1) describe the baseline water quality or quality of the environment to be addressed; 2) identify the nonpoint source(s) of pollution to be prevented or reduced by the Project; and 3) provide GPS information for all sampling locations. The MP shall include a description of the monitoring program and objectives, types of constituents to be monitored, methodology, the frequency and duration of monitoring, and the sampling locations for the monitoring activities.</p> <p><u>Task 3:</u> Develop a Quality Assurance Project Plan (QAPP) linking TCT Project objectives with data quality objectives.</p> <p><u>Task 4:</u> 1) Convene a Monitoring Technical Advisory Committee (TAC) with subject experts including a representative from the State Water Board's Division of Water Quality, to provide technical and scientific advice and perspective on the monitoring study design; and 2) convene a Web TAC with experts including a representative from the State Water Board's Division of Water Quality, to provide technical advice and perspective on Trash Tracker upgrades and the design of the web-based Portal.</p> <p><u>Task 5:</u> Develop and implement a Sampling and Analysis Plan (SAP) for trash trends and flux monitoring methods development and stormwater BMP effectiveness and cost evaluations.</p>
Education, Outreach, and Capacity-building	<p><u>Task 6:</u> Add data layers, reporting tools, and trash capture locations in the Los Angeles area to the existing Bay Area Trash Tracker (developed by SFEP); use GIS-based tools that identify trash hot spots, cleanup events and results, and incorporate data from municipalities with approved trash TMDLs.</p> <p><u>Task 7:</u> Create a new trash reduction portal for the California Water Quality Monitoring Council's My Water Quality interface.</p>

2. Project Goals and Desired Outcomes

The overall goal of the TCT Project is to improve municipal stormwater programs' collective knowledge about California's trash problems and the actions regulators, public agencies, and the concerned public can take to help resolve those problems. This project represents an opportunity to support sustained, long-term water quality improvement that is consistent with California

Water Quality Control Plans, NPDES permits, statewide Policies including the Anti-degradation Policy, and Integrated Regional Water Management Plans. The primary objectives of the project are to:

1. Develop and test scientifically sound and cost-effective stormwater and receiving water trash monitoring methods that allow agencies to measure sustained, long-term water quality improvements over time.
2. Fill critical information gaps on the effectiveness and costs/benefits of implementing specific stormwater BMPs (e.g., street sweeping) that address trash.
3. Develop a centralized public web interface compatible with existing data systems where interested individuals may view map-based information on trash generation rates, trash capture infrastructure, trash hotspot locations; creek and on-land scheduled cleanup events; technical monitoring and BMP reports; and information and recommendations on monitoring methods, costs/benefits of BMPs, as well as a spatial display of successful efforts to reduce trash.

The desired outcomes of the TCT project are:

1. The development of rigorous and repeatable methods that are acceptable for conducting visual assessments and quantitative waste characterizations to evaluate trash from on-land sources and in receiving waters. The visual assessment methods shall be appropriate for use by municipal stormwater programs as well as citizen monitoring groups to evaluate progress towards trash reduction goals (e.g., 303(d) listing for Lake Merritt in Oakland, California) as a result of control measure implementation.
2. Information used to select the most cost-effective management actions to reduce trash, and provide a comparison between institutional BMPs and other types of controls measures (e.g., full capture devices).
3. Enhancements to and expansion of the Bay Area Trash Tracker, including additional data layers, reporting tools, and trash capture locations in the Los Angeles area; and GIS-based tools that identify hot spots, cleanup events and results, and incorporate data from municipalities with approved trash TMDLs.
4. A new trash reduction portal for the California Water Quality Monitoring council's My Water Quality interface, providing public access to municipal trash generation and reduction information.

3. Project Performance Measures Tables

TCT Project Performance Measures for the two applicable major PAEP categories are summarized in Table 2 (Monitoring and Assessment) and Table 3 (Public Outreach).

Table 2: Performance Indicators for TCT Project Planning, Research, Monitoring, and Assessment Activities (Project Tasks 1-5)

Project Objectives	Desired Outcomes	Output Indicators	Outcome Indicators	Measurement Tools and Methods	Targets
<p>1. Develop and test scientifically sound and cost-effective stormwater and receiving water trash monitoring methods that allow agencies to measure sustained, long-term water quality improvements over time.</p>	<ul style="list-style-type: none"> • Development of rigorous and repeatable methods that are acceptable for conducting visual assessments and quantitative waste characterizations to evaluate trash from on-land sources and in receiving waters. The visual assessment methods shall be appropriate for use by municipal stormwater programs as well as citizen monitoring groups to evaluate progress towards trash reduction goals as a result of control measure implementation. • Information used to select the most cost-effective management actions to reduce trash, and provide a comparison between institutional BMPs and other types of controls measures (e.g., full capture devices). 	<ul style="list-style-type: none"> • Sampling and Analysis Plan (SAP) • Quality Assurance Project Plan (QAPP) with Standard Operating Procedures (SOPs) • Monitoring methods developed to accurately calculate trash flux • Populated Project Database • Final Project Report 	<ul style="list-style-type: none"> • Transfer of technology to other areas in California and the U.S 	<ul style="list-style-type: none"> • Stormwater and receiving water trash flux monitoring methods will be developed through the Project. • The detailed study design to develop trash flux monitoring methods will be included in the SAP and QAPP. The conceptual study design will be included in the MP. • The SAP will be informed by a literature review on receiving water and on-land monitoring methods. The SAP will also be informed by previous pilot research conducted by the 5 Gyres Institute, Algalita Marine Research Foundation, NOAA, Caltrans, and BAMSAA. • The SAP will be reviewed by the Monitoring TAC. 	<ul style="list-style-type: none"> • 100% completion of monitoring methodology development. • Broad acceptance and Statewide applicability of the monitoring methodology.

Project Objectives	Desired Outcomes	Output Indicators	Outcome Indicators	Measurement Tools and Methods	Targets
<p>2. Fill critical information gaps on the effectiveness and costs/benefits of implementing specific stormwater BMPs (e.g., street sweeping) that address trash.</p>	<ul style="list-style-type: none"> Information used to select the most cost-effective management action to reduce trash. Data to compare the performance and cost-effectiveness of institutional BMPs to other types of controls measures (e.g., full capture devices). 	<ul style="list-style-type: none"> Sampling and Analysis Plan (SAP) Quality Assurance Project Plan (QAPP) with Standard Operating Procedures (SOPs) Populated Project Database Updated Trash BMP Toolbox (http://www.scvurppp-w2k.com/trash_bmp_toolbox_2007.htm) 	<ul style="list-style-type: none"> Transfer of technology to other areas in California and the U.S. 	<ul style="list-style-type: none"> The detailed study design will be included in the SAP and QAPP. The conceptual study design will be included in the MP. The SAP will be reviewed by the Monitoring TAC. 	<ul style="list-style-type: none"> 100% completion of data collection and analysis. Development of acceptable performance standards for street sweeping in combination with other actions that will have a performance equivalent to full trash capture devices.

Table 3: Performance Indicators for TCT Project Education and Outreach Activities (Project Tasks 6-7)

Project Objectives	Desired Outcomes	Output Indicators	Outcome Indicators	Measurement Tools and Methods	Targets
<p>3. Develop a centralized public web interface compatible with existing data systems where interested individuals may view map-based information on trash generation rates, trash capture infrastructure, trash hotspot locations; creek and on-land scheduled cleanup events; technical monitoring and BMP reports; and information and recommendations on monitoring methods, costs/benefits of BMPs, as well as a spatial display of successful efforts to reduce trash.</p>	<ul style="list-style-type: none"> • Enhancements to and expansion of the Bay Area Trash Tracker, including additional data layers, reporting tools, and trash capture locations in the Los Angeles area; and GIS-based tools that identify hot spots, cleanup events and results, and incorporate data from municipalities with approved trash TMDLs. • A new trash reduction portal for the California Water Quality Monitoring Council’s My Water Quality interface, providing public access to municipal trash generation and reduction information. 	<ul style="list-style-type: none"> • Number of trash capture locations added to the Bay Area Trash Tracker • Number of GIS layers added to the Tracker • Number of hotspot locations shown on the revised Tracker • Number of reporting tools incorporated in the Tracker • Number of new Portals accepted by the California Water Quality Monitoring Council 	<ul style="list-style-type: none"> • Number of enhanced and expanded Bay Area Trash Tracker web tools • Number of new trash reduction Portals in My Water Quality 	<ul style="list-style-type: none"> • Count the number of web resources enhanced or developed by this project 	<ul style="list-style-type: none"> • Add a new public interface to the Trash Tracker incorporating a creek cleanup calendar, trash recovery data, creek trash hotspot data, and information on institutional controls (e.g., street sweeping and product bans) as well as full capture device installation locations. • Expand the Trash Tracker to southern California municipalities with approved trash TMDLs. • Create a new trash reduction portal for the California Water Quality Monitoring Council’s “My Water Quality” interface, specifically “What Stressors and Processes Affect our Water Quality?”