

**STATE OF CALIFORNIA
REGIONAL WATER QUALITY CONTROL BOARD
SAN FRANCISCO BAY REGION**

**STAFF SUMMARY REPORT: Qi Yan
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ITEM: 6

California Department of Transportation, Update on Compliance with Cease and Desist Order No. R2-2019-0007, Implementing Trash Discharge Reduction Requirements

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DISCUSSION

This item provides an update on the California Department of Transportation's (Caltrans') compliance with the subject [Cease and Desist Order](#), as [amended](#) (CDO), which the Board first issued to Caltrans in February 2019 to control trash discharges. We updated the Board on Caltrans' trash control progress in the [August 2023 Executive Officer's Report](#) and with information items at the [April](#) and [December](#) 2023 Board meetings.

Caltrans has made significant progress since 2023 in identifying additional cooperative projects, implementing on-right-of-way device installation, refining its vegetative trash control protocol, and proceeding with its Trash Discharge Study. However, additional actions are needed to comply with the CDO benchmark to control trash from 6,000 acres of significant trash generating areas (STGAs) and to meet future CDO benchmarks. In its recent Trash Reduction Annual Report (Annual Report), submitted this October, Caltrans claims compliance with the CDO's June 30, 2024, benchmark of 6,000 acres of STGAs controlled for trash. The claimed compliance includes several trash control strategies:

- On-right-of-way structural trash controls.
- Off-right-of-way structural controls installed through cooperative projects with local municipalities.
- Roadside vegetation that controls trash that is then removed by maintenance crews.
- Enhanced maintenance measures such as increased street sweeping, trash pickups, and homeless encampment removal.

Through June 2024, Caltrans has implemented on-right-of-way trash control devices and funded off-right-of-way local partnership projects to control trash from 4,706 acres of right-of-way, doubling the acreage managed by structural trash controls since June 2022. The Annual Report also claims compliance with the June 2024 benchmark through implementation of enhanced maintenance and vegetative trash controls on approximately 3,300 acres of Caltrans' Bay Area right-of-way. Caltrans used its revised on-land visual assessment protocol to verify the effectiveness of enhanced maintenance measures to keep areas at a low trash-generating level.

Our November 2023 and September 2024 field inspections with Caltrans staff covered about half of the 3,300 acres of STGA segments and surrounding right-of-way to evaluate Caltrans' proposed compliance with the 2024 CDO benchmark via enhanced maintenance measures

and roadside vegetation controls. Some highway segments in Santa Clara and San Mateo counties were relatively free of trash, as observed from a vehicle moving at highway speed. However, some segments still had trash present along the highway shoulders, especially in landscaped areas off the pavement; this illustrates the challenge of maintaining areas to low trash generating levels due to the ongoing trash regeneration that occurs on highly travelled highways. We observed locations that have dense and consistent vegetation cover that, when combined with trash pickup, likely would prevent trash from migrating to drainage inlets and discharging to receiving waters. We discussed with Caltrans staff the need for some locations to implement additional engineering control measures to improve trash control.

Caltrans has significantly increased funding and trash maintenance activities since the CDO's issuance and the current implementation of enhanced maintenance measures has improved trash conditions along many Caltrans highway corridors. However, results from the Trash Discharge Study are needed to demonstrate the claimed benefits for enhanced maintenance measures.

To demonstrate that trash is appropriately controlled by enhanced maintenance and meets full trash capture equivalency, Caltrans needs to demonstrate enhanced maintenance measures are consistently implemented and verified by visual assessment at a level and frequency sufficient to remove even small pieces of trash. We expect that to be an outcome of the currently in-process Trash Discharge Study. Caltrans also needs to ensure that it has the resources needed to implement the enhanced maintenance measures into the future. The April 2023 and December 2023 Staff Summary Reports describe staff's concerns with the potential deficiencies of enhanced maintenance as a full-trash-capture-equivalent trash control and outline needed next steps to demonstrate the claimed benefits of enhanced maintenance measures and vegetation controls. These include the following:

- Complete the Trash Discharge Study, which is scheduled for completion in 2026, to substantiate the efficacy of enhanced maintenance measures to achieve full trash capture equivalency. Caltrans must also sufficiently track and document maintenance actions, including frequency and work done, to correlate the effort with observed outcomes in all areas claimed as compliant.
- Continue to improve Caltrans' existing on-land visual assessment protocol or establish an equivalent effective visual assessment protocol to characterize trash levels on Caltrans right-of-way.
- Improve the existing vegetative trash control technical memorandum to substantiate the claimed benefits. That is, establish a drainage delineation model with conservative site classification criteria (e.g., consistent low-lying vegetative cover, sufficient vegetation width), field verify drainage delineations, deploy engineering controls at discharge inlets receiving concentrated flow from pavement where vegetation condition is insufficient to trap trash, and commit to appropriate trash pickup activities to prevent subsequent discharge of trash to the storm drain.

Caltrans must also build on recent progress to identify more structural control implementation opportunities. CDO Provision 5 requires Caltrans to perform trash reduction feasibility studies to help Caltrans plan and program trash control and cooperative trash implementation projects with municipalities and prioritize trash controls in its very high and high STGAs. We are working with Caltrans to discuss corridor-based trash control feasibility studies for three prioritized Bay Area highway corridors in Alameda County and San Mateo County. Caltrans needs to continue to proactively develop plans to control trash discharge from its very high and

high rated areas via structural control measures and/or non-structural controls. Additional efforts include the following:

- Continue the granular corridor-based trash control feasibility evaluations, prioritizing highway corridors with the most very high and high STGAs, to identify additional trash reduction opportunities.
- Continue to focus on implementing effective trash controls in very high and high STGAs, including more-extensive and focused implementation of enhanced maintenance measures and structural controls in these areas (e.g., identify trash control feasibility via detailed drainage system retrofit evaluation, such as pump stations, undersized culverts, and storm drain systems under the climate change adaptation effort), especially for low-lying flat areas close to the Bay near I-80.
- Continue to work proactively on planning, design, and construction to support the success of off right-of-way local partnership projects, including new cooperative implementation projects through an extensive drainage system evaluation to identify locations where Caltrans and municipal drainage systems are connected.
- Expedite the pilot testing and implementation of the Hydrodynamic Separator (HDS) units and Multi-Gross Solids Removal Devices (multi-GSRDs) to allow large Caltrans drainage areas to be controlled to achieve CDO compliance.
- Develop high-value and innovative trash reduction strategies for very high and high trash generation rate highway segments where trash capture device installation and maintenance and/or enhanced maintenance measure implementation are constrained, for example due to safety issues and limited right-of-way. Caltrans must begin to assess how they can focus efforts on the trashiest areas to bring about greater water quality benefits, especially for areas close to high-value sensitive habitats, such as marsh wetlands close to the Bay. This includes implementing combinations of trash control measures, such as installing vegetation strips in the buffer zone between roadway and wetland, and at least during extensive dry periods, combining trash control measures with maintenance activities.

The remainder of this report provides the background that led to the CDO and additional detail on: compliance with CDO benchmarks, cooperative trash control implementation projects with municipalities, right-of-way trash control projects, and studies in progress to substantiate the claimed trash control benefits for enhanced maintenance measures and roadside vegetative controls.

BACKGROUND

Consistent with the requirements of the Caltrans Statewide NPDES Municipal Stormwater Permit ([Order No. 2022-0033-DWQ](#)) and the [Statewide Trash Amendments](#) to the Water Quality Control Plans for Ocean Waters and for Inland Surface Waters, Enclosed Bays, and Estuaries, Caltrans must control discharges of trash from significant trash generating areas of its right-of-way by no later than 2030. The Board adopted the CDO because Caltrans had not appropriately characterized significant trash generating areas within its right-of-way or proposed an acceptable plan and schedule to timely control trash discharges via full trash capture devices or full trash capture equivalency controls. The CDO established the following enforceable right-of-way acreage of trash control benchmarks and a schedule for their achievement, as well as planning and reporting requirements sufficient to demonstrate that

Caltrans will substantially control trash discharges from the significant trash generating areas on its right-of-way by 2026, and fully control those discharges by 2030.

- 2,000 acres or more by June 30, 2020;
- 4,000 acres or more by June 30, 2022;
- 6,000 acres or more by June 30, 2024;
- 8,800 acres or more by June 30, 2026; and
- All additional significant trash generating right-of-way areas identified by visual assessments conducted in 2022, 2025, and 2029 by December 2, 2030.

Trash control is typically accomplished via the implementation of full trash capture devices or via a combination of alternative measures equivalent to full trash capture, such as source controls to prevent the discharge of trash in the first place, and trash removal from streets and highways before it can discharge to the storm drain, such as by street sweeping or maintenance crews.

We have met monthly with Caltrans staff to discuss Caltrans' ongoing work to control trash and meet CDO benchmarks. We also met jointly with Caltrans and Save the Bay in May and October 2024 to discuss Caltrans' progress and compliance status with the CDO benchmarks. Below is a summary of developments since the December 2023 Board update.

Enhanced Maintenance Measures, Trash Discharge Study, and Vegetation Controls

Caltrans' 2024 Annual Report proposes approximately 3,184 acres of significant trash generating areas that Caltrans claimed have been converted to low trash generation through implementation of enhanced maintenance measures, verified via Caltrans' on-land visual trash assessment driving protocol. Our evaluation of the enhanced maintenance measures, including field inspections in November 2023 and September 2024 of over 1,000 acres of Caltrans' STGAs where the measures are being implemented, found that although trash control maintenance activities have improved conditions of many Caltrans STGAs, there are highway segments where measures are not being conducted at a level sufficient to convert an STGA to low trash generating or achieve full trash capture equivalency. Although the inspected highway segments in Santa Clara and San Mateo counties were overall less littered than those in Contra Costa County, trash remained along the medians or shoulders of many highway segments, especially in Contra Costa County, where substantial trash maintenance activities had recently been completed. This indicates the current effort may be insufficient to keep up with the significant trash regeneration in many claimed highway segments.

While Caltrans has increased enhanced maintenance measures in recent years, it remains vital to understand the level of effort needed to achieve the full trash capture equivalency standard. The December 2023 Staff Summary Report describes additional actions needed to demonstrate the claimed benefits for enhanced maintenance measures, and conducting planned discharge studies to substantiate the efficacy of enhanced maintenance measures. In 2023, Caltrans initiated a three-year trash discharge study to demonstrate maintenance effectiveness by monitoring the amount of trash entering storm drain inlets at 40 sites in the San Francisco Bay and Los Angeles regions and 20 sites in northern California counties. The study must document the timing, types, and frequencies of maintenance activities that are

implemented during the study; categorize the types of trash that are effectively controlled by enhanced maintenance measures; correlate the observed trash volume with visual assessment ratings from an acceptable visual assessment methodology; incorporate appropriate performance standards; and utilize an adaptive management approach to identify and maintain a level and frequency of maintenance that controls trash discharge to a low level. In addition to demonstrating efficacy, Caltrans must have the resources needed to implement the enhanced maintenance measures into the future, including the long-term maintenance resources to implement, monitor, track, and report trash maintenance activities to ensure CDO areas are controlled to a consistently low trash generation condition. We have engaged with Caltrans on the study design and participated in several technical workshop discussions with Caltrans and State Water Board staff. Caltrans' ongoing Trash Discharge Study will provide further information on maintenance effectiveness and the actual amount of trash getting into storm drain inlets, which will help determine benchmark compliance. We will continue to work with Caltrans to monitor progress, to ensure that sufficient data is collected to support the study's findings, and to identify any needed follow-up actions.

If, at the study's conclusion, Caltrans demonstrates that a consistent type and frequency of maintenance actions result in full trash capture equivalency, Caltrans must then implement and report on the level and frequency of implementation over areas claimed as compliant to ensure actions achieve full trash capture equivalency. If the study concludes that the required maintenance effort is infeasible and unsuitable to achieve full trash capture equivalency from a worker safety standpoint, Caltrans will need to adaptively move toward an alternative compliance strategy, such as implementing additional control measures (e.g., full trash capture devices) in those areas of right-of-way. The challenges Caltrans faces in consistently maintaining significant trash generating areas to a low generation rate highlight the importance of developing innovative trash controls and implementing additional structural controls where feasible both throughout its right-of-way and in coordination with neighboring municipalities.

The Annual Report claims 121 acres of vegetation control credits toward the 2024 benchmark. Our September 2024 joint field visit evaluated locations where Caltrans plans to claim compliance toward the 2024 benchmark based on a combination of roadside vegetation and trash pickup that they claim is sufficient to control trash prior to entering the storm drain system. While most of the inspected areas seem to have dense and sufficient vegetation to detain trash, some areas may need additional control measures to improve the efficacy of trash control, especially for minimizing trash bypass from areas where vegetation may be sparse or is receiving concentrated flow from the nearby pavement. Caltrans is developing a Vegetative Trash Compliance Protocol to identify potential vegetative trash control areas for CDO compliance. Unlike a well-maintained full trash capture system where accumulated trash could be appropriately contained, the potential of trash remobilization is likely higher with vegetative control in the absence of adequate trash pickup maintenance. Therefore, the Protocol must evaluate and specify a minimum level of maintenance that should be implemented to ensure trash is not blown out by wind or remobilized by rainfall events before the next trash pickup maintenance activity. The Protocol also needs to include an adaptive management plan that allows for increased maintenance activities, e.g., when there is evidence of trash remobilization between maintenance events and higher maintenance needs during rainy seasons.

We are working with Caltrans to revise the Protocol to better ensure it meets our expectations to:

- Establish appropriate site classification criteria (e.g., minimum vegetation ground coverage and width).

- Develop a delineation model to allow accurate classification of vegetated cover and identification of tributary drainage areas.
- Commit to adequate trash pickup maintenance actions to remove and prevent remobilization of accumulated trash.
- Supplement delineation results with at least 30 percent field verification. Field verification will ensure drainage areas are properly delineated and identify areas that need additional engineering measures (e.g., around drainage inlets receiving concentrated flow or where vegetation conditions are insufficient to trap trash to a full trash capture equivalency level).
- Conduct annual visual field inspections of 25 percent of the vegetation control areas claimed to ensure sustained compliance. Field inspection frequency may be adjusted over time based on data showing effective performance.

Caltrans should evaluate, track, and report the maintenance frequency in the annual report to demonstrate routine maintenance expectations are met and compliance credits are sustained.

On Right-of-way Hydrodynamic Separator (HDS) and Multi-Gross Solids Removal Devices (Multi-GSRDs) Implementation, and Cooperative Projects

Since December 2023, Caltrans has made significant progress in implementing structural trash controls to control trash from 3,612 acres of right-of-way, which is about 2,500 acres over their achieved acreage for June 2022. Caltrans needs to continue to expedite current implementation and greatly increase planned implementation of structural controls within its right-of-way. This includes the need increase deployment of the newly approved trash capture housing device and expand its current toolbox to incorporate new and/or currently Caltrans-unapproved devices (e.g., HDS units and multi-GSRDs). HDS devices are not currently Caltrans-approved due to potential siting, accessibility, and maintenance constraints. However, HDS devices can be sized to capture trash from large drainage areas, which can eliminate the need to install and maintain multiple smaller inlet-based devices higher in the watershed. Caltrans is conducting a two-year pilot study to evaluate the feasibility of installing large trash capture devices within its right-of-way to allow large Caltrans drainage areas to be treated to achieve CDO compliance. Caltrans must commit to expanding this effort and incorporating HDS units and multi-GSRDs widely as part of the CDO-required feasibility study to identify locations where trash discharge from large drainage areas of its right-of-way can be controlled. Expanding the on-system structural efforts will allow Caltrans to reduce its dependence on the ongoing implementation of non-structural controls to meet future benchmarks, especially for areas where it is less practicable to frequently implement enhanced maintenance measures to achieve effective trash control due to safety concerns in a high-speed environment.

Caltrans staff has continued efforts to identify municipal partners for cooperative projects to install trash capture devices that control trash from both Caltrans and the municipality. Since the June 2022 benchmark, Caltrans local partners have delivered 26 additional projects for off-system full trash capture devices that are in active construction or advertised for construction, contributing an additional 1,532 acres with an accumulated total of 2,528 acres toward the 2024 benchmark. Recently, Caltrans and cooperative project partners (Alameda County and the cities of Emeryville, San Leandro, Livermore, Pittsburg, Antioch, and Berkeley) developed seven new cooperative trash control projects, which will treat over 300 acres of Caltrans STGAs. We anticipate an increase in local collaboration as municipalities need to implement trash capture projects to achieve the June 2025, trash reduction deadline in the Municipal

Regional Stormwater NPDES Permit (MRP). If municipalities are unable to assess and bring forth potential projects due to resource constraints or for other reasons, Caltrans will need to identify potential cooperative partners, evaluate storm drain connections, and find potential locations for trash capture devices within the municipality.

Corridor Feasibility Studies and Prioritization of Very High and High Trash Generation Rate Areas

CDO Provision 5 requires Caltrans to perform trash reduction feasibility studies on ten percent of significant trash generating right-of-way by December 31, 2019, 50 percent by December 31, 2021, and 100 percent by December 31, 2025. The feasibility studies are intended to help Caltrans plan and program stand-alone trash control implementation projects and cooperative trash implementation projects with municipalities and prioritize trash controls in its STGAs. Enhanced maintenance measures to date have been focused on bringing moderate trash generating areas to a low generation level, which makes achieving acreage-based compliance more practicable. However, this can deprioritize some of the trashiest areas of right-of-way. Caltrans must continue its corridor-based feasibility assessments, begun in 2023, to help focus efforts on the trashiest areas to bring about greater water quality benefits.

We urge Caltrans to start prioritizing assessments and implementation of trash controls in remaining uncontrolled very high and high trash generating highway corridors to optimize use of Caltrans resources and expedite planning and implementation of trash controls on its right-of-way. In 2023, Caltrans initiated a series of focused corridor-based feasibility study workshops for three prioritized highway corridors in the Bay Area. We participated in both desktop reviews and field visits with Caltrans staff to ground-truth trash control feasibilities in I-880 and I-80 corridors. Caltrans must work proactively to conduct additional feasibility assessments for the remaining corridors to identify potential locations where trash control measures could be implemented. Caltrans must describe, in its 2025 trash feasibility study report, detailed evaluations of feasible trash control options and plans to control discharge from its very high- and high-rated areas. This includes conducting robust analysis of trash control opportunities through thorough and detailed drainage assessments. Caltrans needs to expand its current toolbox to incorporate new and/or currently Caltrans-unapproved devices (e.g., HDS units and multi-GSRDs) and identify potential drainage connection points between Caltrans and municipal storm drain systems. Although the HDS and multi-GSRD pilot testing is still in progress, we expect them to be included as part of the 2025 feasibility study to help identify viable locations and expedite implementation once the study concludes.

Additionally, climate change-driven sea level rise, coupled with storm surge, presents a threat to the highway system. Addressing the long-term climate change resiliency of the highway system will require Caltrans to conduct a comprehensive assessment of potential future conditions and develop an action plan for improving the existing facilities. Retrofitting existing drainage systems in low-lying highway segments close to the Bay (e.g., I-880) likely must be planned as part of Caltrans ongoing resilience efforts and may present an opportunity to implement trash controls in those significant trash generating areas that don't meet the existing flooding assessment criteria. We urge Caltrans to re-evaluate the corridors that are excluded from trash controls as drainage retrofit projects progress in response to anticipated flooding from sea level rise and extreme storm events.

There is a need to develop innovative trash control solutions for very high and high trash generation rate areas that are constrained by right-of-way space and worker safety considerations. With the limited toolbox currently available, Caltrans is challenged to increase

trash control implementation within its right-of-way. We urge Caltrans to think “outside of the box” to explore actions that can be taken to reduce trash discharges from very high and high trash generating areas, especially for areas where traffic flow and worker safety are not or are less of an issue, such as on- and off-ramps and lanes and right-of-way with wide shoulders. For low-lying highway segments close to the Bay’s sensitive habitats, Caltrans must further evaluate the feasibility of implementing innovative and/or combinations of trash control measures, such as installing vegetation strips in the buffer zone between roadway and wetland, combining trash control measures with maintenance activities, and pursuing new types of maintenance equipment (if that improves accessibility).

SUMMARY

Since the 2022 CDO benchmark, Caltrans has made significant progress in implementing structural trash controls to control trash discharges from its Bay Area right-of-way. Caltrans’ increased funding and dedication of staff and resources toward implementing enhanced maintenance measures has improved trash conditions. However, additional actions are needed to demonstrate that trash pickup activities and other non-structural control implementation meet full trash capture equivalency. This includes further increasing maintenance efforts and completing studies to substantiate the efficacy of enhanced maintenance measures. Caltrans has significant work ahead to meet the 2026 benchmark:

- Increase installation of on-right-of-way structural trash control devices (including its capture housing device (a storm drain inlet screen device), HDS units, multi-GSRDs, and other new devices).
- Continue coordination with municipalities to implement cooperative projects.
- Conduct focused corridor-based trash control feasibility studies for very high and high trash generating highway corridors in the Bay Area to develop effective trash reduction strategies.
- Complete ongoing studies to substantiate the efficacy of enhanced maintenance measures in achieving full trash capture equivalency. Establish a defensible vegetative trash control protocol with a maintenance commitment sufficient to achieve full trash capture equivalence.

We will continue to meet regularly with Caltrans staff to monitor trash control implementation progress, identify additional trash control project opportunities, discuss acceptable methods to assess and demonstrate the effectiveness of non-structural trash control measures, and clearly communicate expectations to ensure effective and compliant controls are implemented that achieve full trash capture equivalency and can be counted toward the CDO benchmark compliance.