

Attachment 4-5



Control Program for Dioxin Compounds per NPDES Permit Provision C.9.e. Work Plan

March 1, 2004

INTRODUCTION

The NPDES permit issued to the Santa Clara Valley Urban Runoff Pollution Prevention Program (SCVURPPP) by the California Regional Water Quality Control Board, San Francisco Bay Region (Regional Board) includes water quality-based requirements for specific pollutants of concern. Provision C.9.e. requires that the SCVURPPP develop a control program to eliminate or reduce discharges of dioxin-like compounds from urban runoff conveyance systems associated with controllable sources (if any), and includes the following language:

Characterize the representative distribution of PCBs and dioxin-like compounds in the urban areas of the Santa Clara basin to determine if: a) PCBs and dioxin-like compounds are present in urban runoff, b) if any such PCBs or dioxin-like compounds are distributed relatively uniformly in urban areas, and c) whether storm drains or other surface drainage pathways are sources of PCBs or dioxin-like compounds themselves, or whether there are specific locations within urban watersheds where prior or current uses result in land sources contributing to discharges of PCBs or dioxin-like compounds to San Francisco Bay via urban runoff conveyance systems;

Provide information to allow calculation of PCBs and dioxin-like compound loads to San Francisco Bay from urban runoff conveyance systems;

Identify control measures and/or management practices to eliminate or reduce discharges of PCBs or dioxin-like compounds conveyed by urban runoff conveyance systems.

Implement actions to eliminate or reduce discharges of PCBs or dioxin-like compounds from urban runoff conveyance systems from controllable sources (if any) ...for dioxin-like compounds: submit plan with implementation schedule by March 1, 2004; begin implementation by July 1, 2004 although implementation of early action priorities should take place before that date.

The SCVURPPP prepared this work plan in accordance with the above requirements for dioxin-like compounds.

DESCRIPTION OF DIOXIN-LIKE COMPOUNDS

The chemical compounds referred to as dioxin-like compounds are generally members of three related families: polychlorinated dibenzo-p-dioxins (PCDDs), polychlorinated dibenzofurans (PCDFs) and polychlorinated biphenyls (PCBs). The specific PCBs congeners with dioxin-like

potency are often referred to as dioxin-like PCBs. PCDDs and PCDFs (referred to collectively as PCDD/Fs) are formed as byproducts in combustion or manufacturing processes. In contrast, PCBs, including dioxin-like PCBs, were intentionally manufactured for a wide variety of applications, and have different sources and probably a different distribution in local watersheds.

This work plan focuses on PCDD/F compounds. It should be noted that dioxin-like PCBs have been found to contribute most of the overall dioxin-like potency in Bay fish (please see the next section – Regulatory Background). For example, dioxin-like PCBs accounted for 81 percent of dioxin-like potency in Bay fish tissue samples collected in 2000 (Greenfield et al. 2003). The SCVURPPP has and continues to address PCBs, including dioxin-like PCBs, through a separate program. For instance, all of the PCBs field characterization programs conducted to-date has included chemical analysis of the 12 PCB congeners thought to contribute significant dioxin-like potency in the environment (Ahlborg et al. 1994; Van den Berg et al. 1998). Please refer to the SCVURPPP's annual reports and work plans for more information regarding PCBs-related activities.

REGULATORY BACKGROUND

The Clean Water Act (CWA) requires that states develop water quality standards protective of human health and the aquatic environment. Section 303(d) of the CWA requires the development of a list of "impaired" water bodies that do not meet these standards. The State Water Resources Control Board (SWRCB) and its Regional Water Quality Control Boards are responsible for compiling and periodically updating the 303(d) list of impaired water bodies in California. The list is subject to approval by the United States Environmental Protection Agency (USEPA).

All segments of San Francisco Bay were initially listed as impaired by certain PCDD/F compounds in the 1998 303(d) list (SWRCB 1999). The listing was repeated in the 2002 303(d) list (SWRCB 2003). The impetus for the listing was an interim advisory on the consumption of fish from the Bay issued by the California Office of Environmental Health Hazard Assessment (OEHHA 1997, 1999). The advisory was issued after PCDD/F compounds and other pollutants (e.g., mercury and PCBs) were found in Bay fish tissue at levels thought to potentially pose a health risk to people consuming fish caught in the Bay.

There is considerable controversy regarding the Bay 303(d) listing and the associated potential threats to human health by PCDD/Fs. The SWRCB and the Regional Board opposed the 1998 listing of PCDD/Fs in the Bay for the following reasons (BACWA 2002):

- Water column concentrations did not exceed PCDD/F water quality criteria.
- Fish tissue concentrations of PCDD/F were consistent with national background levels.
- The fish consumption advisory was an interim action that only included PCDD/Fs because of exceedances of informal screening levels.

The State of California was overruled by the USEPA, which cited two primary reasons for the Bay listing (USEPA 1999):

- Failure to attain a designated beneficial use of the Bay, Commercial and Sport fishing (COMM), based on the interim fish consumption advisory.

- Violation of a narrative objective found in the San Francisco Bay Water Quality Control Plan (Basin Plan) pertaining to bioaccumulation of pollutants.

More recently, the Bay Area Clean Water Agencies (BACWA) requested that the SWRCB move PCDD/Fs from the 303(d) list to the "Monitoring List" (BACWA 2002). BACWA believes the original rationale for listing PCDD/Fs in San Francisco Bay was inadequate, and that new information developed since 1999 further supports removal of these compounds from the 303(d) list. This new information includes studies on pollutant concentrations in Bay fish and local fish consumption, and information found in the California Toxics Rule and the State Implementation Policy. The Clean Estuary Partnership (CEP) is currently developing an Impairment Assessment / Conceptual Model report on PCDD/F in the Bay. This report will provide a more detailed analysis of the status of the impairment and associated uncertainties based on the most current data available.

Total Maximum Daily Loads (TMDLs) are a type of water quality attainment strategy often employed to restore impaired water bodies. TMDLs examine water quality problems, identify sources of pollutants, and specify actions to restore water quality. The 2002 303(d) list (SWRCB 2003) designates the TMDL priority for PCDD/F compounds in the Bay as low, and a schedule for performing a TMDL is not included. The Regional Board is currently performing TMDLs for other pollutants thought to impair the Bay (e.g., mercury and PCBs). However, the SCVURPPP understands that the Regional Board does not plan to perform a TMDL for PCDD/Fs in the Bay. The USEPA believes that, since PCBs are the most significant contributor to dioxin-like toxicity in Bay fish, the Bay PCBs TMDL being conducted by the Regional Board is high priority (<http://www.epa.gov/region09/water/dioxin/sfbay.html>).

PAST SCVURPPP ACTIVITIES

During FY 2001/02, the SCVURPPP submitted an initial work plan (dated March 1, 2002) to address dioxin compounds (SCVURPPP 2002a). The work plan specified reviewing readily available data on methods used to characterize dioxin-like compounds in stormwater runoff and surface waters and concentrations typically found in the Bay Area and other areas. The review revealed that PCDD/Fs have been found in urban runoff in the Bay Area and other locations, and in sediments in the Bay and other estuaries. It was concluded that existing data are not sufficient to characterize the distribution in urban runoff among Bay Area land uses or calculate loadings to the Bay. Based on the data reviewed, combustion-related air emissions may currently be the largest source of PCDD/Fs to the environment and stormwater runoff in the Bay Area. In addition, reservoirs of PCDD/Fs associated with activities no longer practiced in the Bay Area (e.g., medical waste incineration and municipal garbage burning) may exist (SCVURPPP 2002b).

In accordance with the recommendations from the above data review, the SCVURPPP had planned to analyze archived embedded storm drain and creek sediment samples for PCDD/Fs. These samples were archived during the second year (FY 2001/02) of a regional survey of mercury, PCBs and chlorinated pesticides. However, an internal communication error at the project laboratory resulted in inadvertent disposal of the samples before analysis could be performed. However, the Alameda County Clean Water Program has analyzed similar archived sediment samples collected in Alameda County for PCDD/Fs. The SCVURPPP intends to look at the possibility of extrapolating the Alameda County data to other parts of the Bay Area to develop rough characterization and loading estimates.

During FY 2002/03, the SCVURPPP submitted a second work plan (dated March 1, 2003) addressing dioxin compounds (SCVURPPP 2003). The work plan described the SCVURPPP's collaboration with other Bay area stormwater management agencies to develop a "synthesis" document on dioxin-like compounds. This document was recently completed and summarizes the current state of knowledge regarding dioxin-like compounds in relation to stormwater runoff. The emphasis is on issues related to urban runoff in the Bay area, including regulatory context, impacts, sources, pathways, review of relevant Bay Area, national and international studies, and qualitative review of potential stormwater controls (BASMAA 2004).

In accordance with the March 1, 2003 work plan, the SCVURPPP has also continued to work with other Bay area dischargers and Regional Board staff through the Bay Area Stormwater Management Agencies Association (BASMAA), the CEP and the San Francisco Estuary Regional Monitoring Program (RMP) to coordinate PCDD/F-related activities.

CURRENT AND FUTURE SCVURPPP ACTIVITIES

The SCVURPPP will implement the actions described below beginning July 1, 2004 (implementation of some of these activities has already begun). The actions fall under two general categories:

- Regional, State and Federal Coordination
- Monitoring and Science

The below actions generally target PCDD/Fs and not dioxin-like PCBs. As described earlier, the SCVURPPP is addressing dioxin-like PCBs as part of a separate program.

Regional, State and Federal Coordination

The SCVURPPP will actively track regional, state and federal efforts relevant to reducing dioxins emissions to the environment. Staff will also encourage co-permittees to track, understand, and participate in these programs as appropriate. Co-permittees may wish to evaluate performing public outreach activities and developing policies and ordinances, such as the City of Palo Alto's Dioxin Elimination Policy.

Relevant regional, state and federal efforts include those described below.

ABAG Bay Area Dioxins Project

Beginning in 1999, the Bay Area Dioxins Project (<http://dioxin.abag.ca.gov/index.html>) began investigating the problems posed by PCDD/Fs and potential source control activities. This effort is managed by the Association of Bay Area Governments (ABAG) and is funded through grants from USEPA and contributions from the City of Berkeley, the City of Palo Alto (a SCVURPPP co-permittee), the City of Oakland, the City and County of San Francisco, the County of Alameda, and the Port of Oakland. The primary goals of this effort are to:

- Pool local governments' knowledge and resources to study dioxins and to provide information about possible solutions or actions for local governments in the San Francisco Bay Area.
- Coordinate efforts with state, federal, and regional agencies working on dioxins issues.

- Work with community groups, trade and industry groups, and the general public on issues of concern related to dioxins.

The Bay Area Dioxins Project is focused specifically on pollution prevention (*i.e.*, preventing the formation of PCDD/Fs). On behalf of the project, TDC Environmental (2001) conducted a screening evaluation of a set of dioxins pollution prevention options identified by the participating municipalities. The evaluation process consisted of identifying benefits, detriments, implementation issues, and costs associated with various pollution prevention options. The options investigated are listed in Table 1.

Table 1. PCDD/F Pollution Prevention Options, from TDC Environmental (2001). Sources associated with dioxin-like PCBs not included.

PCDD/F Source	Pollution Prevention Options
2,4-D (weed control)	<ul style="list-style-type: none"> • Mechanical weed control • Other herbicides
Agricultural Burning	<ul style="list-style-type: none"> • Non-burning alternatives
Diesel Engines	<ul style="list-style-type: none"> • Natural gas • Biodiesel • Oxydiesel • Diesel engine retrofits • Reduce trips/change modes
Drum Reclamation	<ul style="list-style-type: none"> • Non-burning methods
Medical Waste	<ul style="list-style-type: none"> • Non-incineration medical waste management methods • Reduce medical waste volumes • Eliminate medical PVC use
Paper Bleaching	<ul style="list-style-type: none"> • Process or totally chlorine free paper • Elemental chlorine free paper
Pentachlorophenol (PCP)	<ul style="list-style-type: none"> • Non-wood alternative utility poles • Different wood preservatives
Petroleum Refining	<ul style="list-style-type: none"> • Refining process modifications
Polyvinyl Chloride (PVC)	<ul style="list-style-type: none"> • Non-PVC alternatives
Wood Burning	<ul style="list-style-type: none"> • Natural gas fireplaces • USEPA-certified wood stoves • BAAQMD model ordinance "Better wood burning practices" • No burning

The project has facilitated a series of public meetings, including a workshop and vendor fair, to educate public agency staff, elected officials, and the public on the environmental impacts of dioxins and pollution prevention options. Resources for municipalities to implement four dioxins pollution prevention pilot projects have been provided:

- Diesel alternatives
- Purchasing of dioxin-free paper products
- Purchasing of PVC alternative building materials

- Medical waste management

A final project report is currently being prepared that will include a review of the extent of implementation in the Bay Area of the dioxins pollution prevention measures in Table 1. Many Bay Area municipalities are already implementing one or more of the measures. One example of implementation is the City of Palo Alto's public outreach regarding PCDD/F and other emissions associated with residential wood burning.

California Air Resources Board

The California Air Resources Board (CARB) develops statewide programs and strategies to reduce the emission of smog-forming pollutants and toxics by non-mobile and mobile sources. These include both on and off-road sources such as diesel trucks, heavy-duty construction equipment, and stationary engines (e.g., stand-by power generators). CARB's efforts may lead to reductions in PCDD/F emissions associated with diesel combustion.

AB 204 - Motor Vehicle Mitigation Fund

The Motor Vehicle Mitigation Fund (AB 204) would support projects that reduce, remediate, or offset adverse environmental impacts of motor vehicles and related facilities (e.g. public streets, roads, bridges and parking lots) on the quality of the waters, watersheds, riparian areas and habitats of the San Francisco Bay Area. One such potential impact is urban runoff transporting PCDD/Fs emitted by diesel trucks to the Bay. This legislation authorizes a fee of up to \$4.00 per vehicle per year to be assessed on vehicles registered in Bay Area counties that choose to participate in the program. Each county would elect to participate by a majority vote of its board of supervisors. At least three of the nine Bay Area counties would need to participate for the program to be activated. If all nine Bay Area counties participated, the fund would generate close to \$20 million annually to reduce and prevent environmental impacts from motor vehicles and related facilities. The BASMAA Executive Board recently approved sending a letter of support for this bill.

USEPA

USEPA has taken aggressive actions to reduce and control dioxins in all environmental media by placing strict regulatory controls on all of the major industrial sources of dioxins. Known, quantifiable industrial emissions have been reduced by more the 90% from their levels in the 1980's as a result of USEPA's efforts, along with efforts by state government and private industry. Other related USEPA efforts include:

- Nationally, USEPA is reviewing dioxin's toxicity. A draft risk reassessment was circulated in 2002. A final risk assessment is pending.
- USEPA is working with the Bay Area Air Quality Management District and CARB to collect data on ambient dioxin levels in Bay Area air.
- USEPA has several projects and partnerships underway to reduce pollutant loadings and educate people fishing from the San Francisco Bay, including a Hospital Waste Pollution Prevention (P2) project and a grant to the California Department of Health Services for a Seafood Consumption Outreach project to reduce consumption levels in at-risk populations.

More information on USEPA's efforts related to dioxins and San Francisco Bay are available at www.epa.gov/region09/water/dioxin/sfbay.html.

Monitoring and Science

The SCVURPPP will continue to work with other Bay area dischargers and Regional Board staff through BASMAA, the CEP and the RMP to coordinate and plan any future PCDD/F monitoring activities. This will include providing funding to these organizations, participating in selected stakeholder meetings, committees and work groups, and, as appropriate, reviewing and commenting on relevant documents prepared by the CEP, RMP and Regional Board staff.

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