

Dan Cloak Environmental Consulting

To: Andria Ventura, Clean Water Action
From: Dan Cloak
Environmental Technical Representative to the Clean Estuary Program
Subject: **Update on Environmental Technical Representative Activities**
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Background: Public Participation and Risk Reduction

Last September, the Water Board adopted its TMDL and Basin Plan Amendment (BPA) for mercury. In late October, the Clean Estuary Program (CEP) sponsored a “roundtable” discussion on the forthcoming TMDL and BPA for PCBs.

Although we didn’t get everything we wanted in the mercury TMDL and BPA—and the PCB TMDL and BPA are still in progress—discussions in late 2004 mark two significant advances for environmental advocates:

1. Water Board staff committed to a better process for engaging stakeholders in development of future BPAs.
2. Dischargers have taken the lead to begin exploring options for “risk reduction” in addition to discharge control.

Looking to the future, there is also potential progress in a third area—building coordinated actions to better regulate pesticides and other products that are harmful to the environment.

Each of these advances broadens the CEP’s scope from its original narrow focus on pollutant sources and loadings toward a creative and more public examination of options for reducing pollutant effects and regaining beneficial uses of the Bay.

Participation in developing BPAs. Although the mercury TMDL was years in preparation, Water Board staff’s development of the mercury BPA—which guides provisions of discharge permits and therefore governs future activities and expenditures by dischargers—was a rushed affair. After the mercury BPA’s adoption, in meetings of the CEP Technical Committee and Work Groups, Water Board staff stated their intent to more effectively involve “stakeholders”—including dischargers and advocates—in drafting future BPAs. The PCB “roundtable” took a first step by allowing interested parties to put forward and discuss issues they want addressed in the forthcoming BPA for PCBs.

Risk Reduction. The mercury BPA spelled out the obligation of dischargers to “reduce mercury-related risks to humans and wildlife” as well as to “control mercury sources and loading.” In the PCB roundtable discussion, advocates emphasized the need to identify people potentially

affected by PCBs in fish and mitigate the risk to their health and to also identify ways to offset impacts to species most affected by PCBs.

Mercury and PCBs account for most of the known health risk of consuming San Francisco Bay fish.

Most mercury in Bay sediments is the legacy of past mining practices. Most PCBs in Bay sediments were deposited prior to the 1978 ban. Even if existing loads were stopped entirely, excessive amounts of mercury and PCBs in the Bay would persist for generations.

These facts were known long before the Water Board started its TMDL process. TMDLs calculate the rate at which a water body can assimilate a particular pollutant—and then allocate allowable loads among pollutant sources.

By the logic of the Clean Water Act, the allowable loading to San Francisco Bay of PCBs, mercury, and various other pollutants should be zero.

Therefore, quantification and calculation of loads, loading reductions, and recovery times—the subject matter of most of the Clean Estuary Program's work—is somewhat academic. Except for bureaucrats and consultants, few are interested in fine-tuning projections of conditions 75 or 150 years hence.

Fortunately, reality is more complex than this regulatory framework, and provides more cause for hope.

The effects of Bay pollutants on both humans and biota—while serious—are confined to specific circumstances and could be mitigated, to some extent, by well-aimed intervention.

People who consume Bay fish are exposed to mercury, PCBs, and other pollutants. A 1998 San Francisco Estuary Institute survey of Bay anglers suggests that relatively few of them consume their catch frequently enough to pose a risk to their health. Black and Asian anglers are more likely to be in this group. Although the California Office of Environmental Health Hazard Assessment consumption guidelines are based on additional risk of cancer, the most likely health effects of mercury and PCB exposure are developmental disabilities in children who eat Bay fish.

Not enough is being done to identify those most at risk, to determine the extent to which they may have been exposed to pollutants, to determine whether they may have suffered health effects as a result, or to offer ways to help them avoid or recover from those effects.

Many species of Bay biota may be affected by pollutants. Evidence of impairment of the Bay's aquatic habitat is shown by pollutant concentrations in some animal tissue—for example, mercury in least tern eggs and PCBs in seal fat—that may be associated with impaired reproductive success. (In only a few Bay locations, sediments are so polluted that few, if any, benthic organisms survive.)

Other significant factors such as diversions of Delta freshwater inflows, the presence of exotic species, and lack of contiguous wetland habitat affect the Bay's ecology in general and threatened species in particular. Some of these factors can and are being improved by intervention.

The Bay will continue to be impaired by excessive concentrations of mercury and PCBs for many years. “Risk reduction” measures cannot substitute for reasonable and feasible measures to control discharges and clean-up “hot spots,” but are necessary to minimize impacts to human health and wildlife in the interim.

Creation of the “Risk Reduction” Work Group

Following the inclusion of “risk reduction” language in the mercury BPA—and also following the Technical Committee’s preliminary approval of a pilot project to study health impacts of listed pollutants—the Bay Area Clean Water Agencies (BACWA, representing municipal wastewater dischargers) contacted Water Board staff and environmental advocates to discuss creation of a CEP work group. BACWA’s proposal calls for this work group to organize a “workshop” to share ideas about risk reduction, to be followed by development of an overall plan for risk reduction.

At the request of Baykeeper and Clean Water Action, I have fit participation in the Risk Reduction Work Group into the scope of ETR activities (assisted by a recent increase in funding from the CEP). The Risk Reduction Work Group now includes a representative from the Bay Area Stormwater Management Agencies Association (BASMAA), and other members may be added as activities get underway.

Other Follow-Up on the Mercury TMDL and BPA

A CEP contractor is preparing a Conceptual Model/Impairment Assessment report for mercury. The report may be useful in formulating and guiding the “adaptive implementation” process incorporated in the mercury BPA. For example, the TMDL and BPA assumed a linear relationship between elemental mercury and methylmercury (the bioavailable form of mercury), but other studies conclude that changes in methylation rates have much greater potential to increase methylmercury exposure than do changes the presence and distribution of inorganic mercury.

One chapter of the report, on methylmercury, has been distributed for review. My comments on this chapter focused on proposed experimental methods for measuring methylmercury production. A complete draft of the report is expected at the end of January.

One area of particular concern is mercury exposure to people or wildlife near wastewater discharges. Although the quantity of mercury in wastewater is miniscule compared to what is already in Bay sediments, it is possible that the mercury in wastewater is more bioavailable. I continue to review research on this topic.

The “Multi-Box” Model

As noted in a previous report, preparation of a “multi-box” model of the Bay will consume a substantial portion of CEP resources for the next two to four years. The Technical Committee approved the scope and first-year expenditure, but incorporated some milestones when progress will be evaluated and the Technical Committee will decide whether to continue.

At the January Technical Committee meeting, it was reported that initial runs of the multi-box model suggest that loading reductions (of PCBs) would have a less dramatic effect on recovery than indicated by the “one-box” model used in the Water Board’s January 2004 PCB TMDL Project Report. In response to a question, Water Board staff confirmed that this outcome of the “multi-box” model is unlikely to substantially affect what measures will appear in the Basin Plan Amendment for PCBs.

CEP Projects Related to PCBs

A PCB Food Web Model study examined the transfer of PCBs between water, sediment, and biota. The food web model would support objectives for PCB concentrations in water and sediment based on calculations of how these concentrations, if attained, would eventually yield an acceptable PCB concentration in targeted fish species. The study used typical factors from the literature of ecology and toxicology and compared model results to observed relationships in the concentrations of PCBs found in water, sediment and tissue. The CEP commissioned an expert review, which criticized over-simplifications in the model and pointed out where different assumptions about life-cycles, seasonal and episodic events, and other factors could yield different conclusions. The expert review raised questions about whether the food web model was worth pursuing at the current level of funding and complexity. The expert comments were referred to the study’s author.

A comparison of PCB concentrations in near-shore vs. deep-water sediments—conducted, in part, to support an interim target for clean-up of “hot spots”—raised interesting questions about PCB sources and transport, but did not provide a strong statistical basis for selecting a target clean-up level. Like so many regulatory decisions, that will need to be made on “best professional judgment.”

The CEP Technical Committee approved a project to begin developing an implementation strategy for PCB cleanup—one of the few CEP projects to focus on implementation. However, the scope calls for developing an “approach” rather than (for example) collecting, compiling, and analyzing available information about PCB sites. In an initial presentation to the PCB Work Group, the selected contractor’s project manager—Betsy Elzufon of LWA, Inc.—suggested that some progress may be made beyond developing the “approach.”

Dioxins

The San Francisco Estuary Institute delivered a third (final) draft of a Conceptual Model/Impairment Assessment for dioxins. Having commented on earlier drafts in March and October 2004, my comments on this draft were limited to minor corrections. Some key findings to keep in mind:

- “PCB-like” dioxins are responsible for the greater part of potential dioxin-caused impairment of the Bay. Water Board staff has said that “PCB-like” dioxins (also known as “dioxin-like PCBs”) would be dealt with in the forthcoming PCB TMDL, and are not included in the dioxin CM/IA.

- There are no regulatory standards for dioxins in fish, shellfish, or sediments. The report found that the Bay is possibly impaired by dioxins based on comparison of limited fish tissue data to screening levels. In addition, limited water data indicates possible impairment (when compared to the California Toxics Rule criterion).
- Many “point sources” of dioxins, including synthesis of organochlorine pesticides, pulp bleaching, and production of polyvinyl chloride, have been largely controlled in recent decades.
- “Legacy” sources predominate over current sources; however, current sources may be such that current impairment status would continue.

Selenium

Pacific EcoRisk submitted a second draft of a Conceptual Model/Impairment Assessment for selenium. The information in the report was quite complete, but it is unclear how the CEP should proceed. Some key issues regarding selenium are:

- Chemical speciation of selenium is complex.
- Following changes in refinery discharges, dissolved selenium concentrations in the north Bay declined markedly 1997-1999; however, there was no associated decline in particulate selenium or selenium in bivalves.
- Water concentrations of selenium are generally within regulatory limits. The 303(d) listing is based on a health advisory in Department of Fish and Game Waterfowl Hunting Guidelines. Hunting and consumption of targeted duck species (scaup and scoter) is thought to be rare. Effects on reproduction of these duck species and on sturgeon have been hypothesized but are not known.
- The US Bureau of Reclamation is continuing to develop disposal alternatives for agricultural drainage. There is reasonable concern that extension of agricultural drainage to the Bay could overwhelm the Bay’s capacity to assimilate selenium.
- Selenium can inhibit production of methylmercury and decrease bioaccumulation of mercury in the food web.

Diazinon and Toxicity

In December, Pacific EcoRisk delivered a third draft of the Conceptual Model/Impairment Assessment for Diazinon in San Francisco Bay. In January, the Diazinon/Toxicity Work Group resumed consideration of a scope of work to prepare a Water Quality Attainment Strategy (WQAS) for Diazinon and Pesticide-Related Toxicity in the Bay. The WQAS will incorporate preparation of a Basin Plan Amendment.

Water Board staff also presented a project plan for preparing a WQAS for Diazinon and Pesticide-Related Toxicity in Urban Creeks. Water Board

staff plans to circulate draft Basin Plan Amendment language and meet with stakeholder groups before having a roundtable session on March 15. Water Board staff may incorporate information or perspectives from these meetings into a revision of the March 2004 draft TMDL staff report for Diazinon in Urban Creeks. Water Board staff may also, at the same time, present proposed language to be incorporate in NPDES permits for stormwater dischargers.

In fulfillment of existing permit requirements, public agencies have developed extensive public education programs promoting Integrated Pest Management and use of less toxic alternatives. Public agency programs include distribution of information at planning counters and sponsorship of the “Our Water, Our World” regional program.

Success in further reducing pesticide discharges to creeks and the Bay requires more effective state and Federal regulation of pesticide production and sale. Staff members representing several agencies are engaged in the Urban Pesticide Committee. Through grants managed by the San Francisco Estuary Project, Kelly Moran of TDC Environmental has prepared analyses of *Insecticide Market Trends and Water Quality Implications* (April 2003) and a recent annual update of efforts by municipal wastewater dischargers, urban runoff dischargers, and the state and regional water boards to influence the USEPA Office of Pesticide Programs and the California Department of Pesticide Regulation, *Improving Urban Pesticide Regulatory Activities to Protect Water Quality—Annual Update 2004*.

An effective advocacy campaign must include three coordinated elements: research, legislative advocacy, and grassroots. The current efforts of agency staff, through the Urban Pesticide Committee, represent excellent technical and regulatory research; there may be much to gain by coordinating this research with legislative advocacy and mobilization of public opinion.

PBDEs

The CEP Technical Committee approved a scope and budget for a Conceptual Model/Impairment Assessment of polybrominated diphenyl ethers (PBDEs) in San Francisco Bay. There is little information to go on; data on ambient concentrations in water and sediment is lacking, as are estimates of wastewater and stormwater discharges. There are, as yet, no regulatory criteria, so even with such data, it would not be possible to judge clearly whether or not the Bay is impaired by PBDEs.

Perhaps one outcome of the study might be a better historical understanding of the development, use, and recently legislated phase-out and ban of PBDEs. If only we'd understood the consequences a bit sooner.

Summary

Throughout 2004, I was able to advocate (1) focusing the CEP's technical work on development of options to reduce pollutant discharges and pollutant impacts and (2) using the CEP as a forum to help Water Board

staff select sets of options that could be supported (or at least not be strongly opposed) by dischargers and environmental advocates.

On the whole, the CEP's projects and expenditures still reflect the (questionable) idea that prolonged and expensive investigations are needed to obtain defensible sediment targets and loading allocations. Questions of whether and how targets might be achieved are still relegated to secondary status.

However, there is noticeable movement—evidenced by the embrace of “risk reduction”—toward engaging the CEP in the study of methods to control the effects of pollutants in the Bay. This is a positive step toward selecting and implementing those methods, including, we hope, actions to head off what could otherwise become the “legacy” pollutant problems of tomorrow.