APPENDIX C

Key State Water Quality Control Policies

1. Developing California's CWA Sec. 303(d) List

2. Adressing Impaired Waters: Regulatory Structure and Options (TMDLs)

3. The State Implementation Plan - Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays and Estuaries

4. Federal and State Anti-Degradation Policies

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Policy for Delveloping California's CWA Sec. 303(d) List

Role of Science and Engineering in Decision-Making at the Water Boards

303(d) Listing of Impaired Water Segments

Sec. 303(d) of the federal CWA requires the states to identify certain waters within their borders that are not attaining water quality standards.

Placing a water segment on the list of impaired water bodies (the 303(d) list) if formal process outlined in "*Water Control Policy for Developing California's Clean Water Act Section 303(d) List" (Sep. 2004).* (*Also looked at the April 30, 2224 "Notice of public solicitation of water quality data and information – 2004 CWA Sec. 303(d) list."*) The policy document contains the listing process methodology for the listing and delisting process. Because portions of the policy document are based on science, it was subjected to formal peer review in accordance with Sec. 57004 of the H&SC.

Science is a key element in determining whether a water segment meets the criteria for listing. It begins with the water quality standards (WQOs) established to protect the beneficial uses of the water segment or body. These include the numeric WQOs in the California Toxics Rule, numeric WQOs for conventional or other pollutants, and numeric WQOs or standards for bacteria (where recreational uses apply). Listing can also occur if there are health advisories (e.g., fish consumption advisories issued by OEHHA or DHS) or shellfish harvesting ban (issued by DHS). Listing can occur for water/sediment toxicity associated with pollutants or toxicity alone. *Toxicity testing could be performed with fish, shellfish, other biota but must follow technical guidelines and statistical analyses. At least three years of data are required to establish a degradation trend.* Listing can occur for "nuisance", i.e., odor, taste, excessive algae growth, foam, turbidity, oil, trash, and color with numerical water quality data that meets specified requirements. Listing can occur from adverse biological responses, such as fish or bird kills, reduction in growth, reduction in reproductive capacity, abnormal development, histophathological abnormalities, and other conditions. To address the antidegradation component of water quality standards, listing can occur for negative trends in water quality. Numeric, pollutant-specific WQOs need not be exceeded to satisfy this listing factor. Listing can occur for degradation of biological populations and communities. This could occur from, for example, chemical concentrations, temperature, dissolved oxygen, and trash. All of the

foregoing have technical and scientific criteria that must be met before the water segment can be a candidate for listing. All data collected and analyses performed are subject to data quality assessment, quality assurance and quality control requirements. The policy document is very comprehensive in the requirements and methodologies that must be used to list or de-list a water body segment.

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Adressing Impaired Waters: Options

Role of Science and Engineering in Decision-Making at the Water Boards

(see table next page)

Plan, Policy, Program (**where** science is used)	Science – Engineering (**what** science is used)	Role in Decision (**how** science is used)	Commentary	Recommendations (how to improve)
"Water Quality Control **Policy** for Addressing Impaired Waters: Regulatory Structure and Options " Total Maximum Daily Loads (Adopted June 16, 2005)	Contains: Regulatory options for addressing impaired waters in California. Includes options to consider: a. Changes to the standards to make them amenable to implementation due to natural site specific conditions, or where standards are too broad or vague (for example where a metals objective is set at a specific default hardness and the specific water has a different hardness that makes the metal less bioavailable) or where incompatible or incorrect uses. b. Recommend delisting the water if standards are met.	The science used in TMDL development and implementation includes: Chemistry, Aquatic Toxicology, Statistics, Biology, Fisheries Biology, Toxicology, modeling, ecology, engineering, hydrology, and geology depending on the specific pollutant and beneficial uses that are impaired. The allocations are scientifically derived to protect the beneficial uses and to ensure that the standards are attained. Engineering is used to ensure that the best available treatment technology is implemented.		

	c. Regulatory Options for establishing the load allocations and waste load allocations and the accompanying implementation plans. The regulatory options include: 1. Adopting the allocations and implementation plans into the water Quality control Plans. 2. Establishing the TMDL through a single regulatory action (for example in an NPDES permit, or WDR or Clean-up and Abatement Order or Waiver) 3. Certifying the actions of another party will meet the allocations and insure that water quality standards are attained.			

APPENDIX C – 3

The State Implementation Policy (SIP) for Implementation of the Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries

Role of Science and Engineering in Decision-Making at the Water Boards

Legal mandates and requirements

Sec. 303(c)(2)(B) of the Federal CWA requires that states adopt numeric criteria for priority pollutants for which EPA has issued criteria guidance, as part of the states' water quality standards. US EPA promulgated these criteria in 2000 because the State court overturned two of the State's water quality control plans in 1994 (the Inland Surface Waters Plan and the Enclosed Bays and Estuaries Plan) and the state was left without enforceable standards. The federal toxics criteria apply to the State of California for inland surface waters, enclosed bays and estuaries for "all purposes and programs under the CWA. There are 126 chemicals on the federal California Toxics Rule (CTR) list (see 40 CFR Part 131, May 18, 2000). The SIP adds another 6 isomers of chlorinated dioxins and 10 isomers of chlorinated furans for optional use in California (however, these are required to be used in the California Ocean Plan). With regard to these 16 isomers, the State Board and Regional Boards are ahead of other states and the federal government in regulating chlorinated dibenzodioxins and dibenzofurans to protect human health, especially with regard to consumption of contaminated fish and shellfish.

The state regulates discharges of toxic pollutants to inland surface waters, enclosed bays, and estuaries under the authority of the California's Porter-Cologne Water Quality Control Act and the federal CWA. Regulation is by issuance of NPDES permits. Permits specify effluent limitations in order to meet water quality criteria/objectives in the CTR and NTR. The SIP was created, in part to provide consistency throughout California NPDES permits. The procedures, algorithms, and statistics used to determine effluent limits (maximum observable effluent concentrations, or MECs) are described in detail in the SIP (see pp. 2-18).

Determining permitted effluent limits in discharges

Calculating an effluent concentration (or mass) limit is dependent on several key scientific considerations. What is the quality of the receiving water before (upstream,

or background) and after the discharge? Can mixing zones or dilution credits be allowed? How many other sources of discharge are affecting the receiving waters? How to determine waste load allocations for each discharger (also part of the TMDL process)? These are data intensive issues and the SIP specifies reference methods and procedures for collection, sampling (e.g., locations and time intervals), analysis (methodology, calibration, quantification limits, quality control and quality assurance), and reporting (includes limits of detection and quantification, reporting limits and estimated concentrations) of water sampling and analyses. The SIP states that the Regional Water Boards shall require periodic monitoring for all 126 CTR priority toxic pollutants at least once every permit cycle even if no effluent limitations have been established. Using these data, the calculation of an allowable effluent concentration follows very specific formulae and statistical analyses in the SIP (pp. 5-11). Other methods can be used if proven to be scientifically sound and deemed protective of beneficial uses. Calculation of effluent limits may also utilize any of three U.S. EPA-recommended dynamic models (continuous simulation, Monte Carlo simulation, log normal probability modeling) when sufficient effluent and receiving water data exist. The SIP further requires the Regional Boards to impose more restrictive water quality-based effluent limitations where necessary for the protection of beneficial uses or where otherwise required by law. This could occur, for example, when complying with state and federal antidegradation policies or federal anti-backsliding requirements. In the final analysis, "calculated effluent limitations must be compared to the technology-based effluent limitations for the pollutant, and the most protective of the two types of limitations shall be included in the permit." (cf. SIP p. 11) Thus, effluent limits may be either science-based or technology-based, but would not be greater than that determined by scientific analyses and calculations. Determining the efficacy of technology-based effluent limitations would require staff to have an understanding of the science and engineering in back of the technology.

Determining compliance with effluent limits in permits

Compliance with achieving a CTR criterion and/or effluent discharge limits includes establishing time schedules, monitoring, and reporting requirements. Time schedules include a series of actions required to meet a criterion or limit or interim limit. By State Board policy, RWQCBs "shall require dischargers to conduct self-monitoring programs and shall clearly state in all permits the objective and purpose of the monitoring." (cf. p. 22) The permit monitoring and reporting requirements shall include "the sampling parameters, monitoring frequencies, locations, and analytical methods to be used." (cf. p. 22) These are detailed requirements based on science, statistics, and analytical technology. Approved analytical methods are referenced in the SIP or in the Code of Federal Regulations. Only when no methods are specified,

may methods approved by the SWRCB and RWQCB be used. Laboratories analyzing compliance monitoring samples must be certified by DHS and must include QA/QC data in their reports. (cf. p. 22) Very specific laboratory reporting requirements and reporting protocols are specified in the SIP (see pp. 23-25). Because compliance relies on self-monitoring and use of contract laboratories by most permitees, the State Board is prescriptive in how this shall be done. The role of the State and Regional Board staff, including scientists and engineers, is to ensure that the data and reports submitted by permit holder's meet these requirements. A technical staff person (engineer or scientist) in each of the Regional Boards is asked to volunteer as a QA officer to handle QA accountabilities as an additional duty. The State Water Board has a full-time QA manager who is a chemist and is well versed in analytical chemistry methods, and relevant federal and state regulations. The QA manager assists the RWQCBs, labs, and public with all QA requirements and answer questions.

Any aspect of the SIP can be updated at any time necessary. However, the SIP must go through a 3-year public review process to evaluate new science and technology, as well as give the public an opportunity to discuss policy needs. The last Triennial review began in August 2003 and finished on February 24, 2005 with the adoption of 3 amendments.

Summary

U.S. EPA can establish water quality criteria in regulation and have done so with providing California with the CTR. However, the State can also review and adopt criteria based on the needs of the State Waters beneficial uses. Technical and scientific methods and procedures for determining effluent limits for waste discharge permits are prescribed in the SIP. Requirements for dischargers to comply with effluent limits are prescribed in the SIP. All are based on science and engineering.

APPENDIX C - 4

Anti-Degradation: Federal and California Policies

Role of Science and Engineering in Decision-Making at the Water Boards

Federal regulations governing water quality standards promulgated in November of 1975 require each state to adopt an antidegradation policy as an integral part of its water quality standards. As defined in federal rules, a "water quality standard" consists of three parts: (a) designation of the beneficial use or uses of a water body; (b) the numerical or narrative water quality criteria ("objectives" under California state law) necessary to protect the use or uses of the particular water body; and (c) an antidegradation statement. The California State Water Resources Control Board adopted its antidegradation policy in 1968. It is generally referred to as Policy 68-16, but its full title is "Statement of Policy with Respect to Maintaining High Quality of Waters in California."

Federal rules (40 CFR 131.12 [1975]) established three tiers of water quality protection for then existing beneficial uses. Tier 1 is that which is necessary to support existing uses. This tier must be maintained. Tier 2 is water quality that is better than is necessary to maintain fish life and allow water contact by people ("fishable and swimmable"). This level must also be maintained unless some degradation of water quality is necessary to accommodate important social or economic development. Tier 3 is water quality that is necessary to maintain "outstanding national resources waters (ONRW)," such as lakes and rivers in National Parks or wildlife refuges. In California, Lake Tahoe and Mono Lake are designated as federal ONRWs. Also in California are thirty-four areas of special biological significance (ASBS, such as the Monterey Bay National Marine Sanctuary) that are afforded similar protection under the Ocean Plan as ONRW under federal law. The Tier 3 level of water quality must be maintained and not degraded. Only Tier 2 waters may be degraded and only to the extent to allow important social or economic development. All activities that might affect surface waters must adhere to the 1975 federal rules, which include an anti-degradation analysis at some point during the permit approval or renewal process.

California's State Water Board Policy 68-16 differs from the federal antidegradation requirements in several ways. First, it predates the federal rule by seven years and consequently includes water quality changes since 1968. Second, it includes potential beneficial uses in addition to actual beneficial uses of waters. Third, it protects all uses, not just the federal "fishable/swimmable" uses. Fourth, it addresses all waters in California, both surface and ground waters. Policy 68-16 established

California's first antidegradation policy to protect all beneficial uses of both surface and groundwaters and therefore exceeds the more recent federal requirements.

Policy 68-16 forbids the lowering of any water quality in California unless four findings are made:

1. The change is consistent with the maximum benefit to the people of the state.
2. The change will not unreasonably affect present and anticipated beneficial uses of the water.
3. The change will not result in water quality less than that prescribed in existing policies and basin plans.
4. The discharger can show that it has implemented the best practicable treatment and control of the discharge.

What this means is that, if the water quality is better than it needs to be in order to protect the actual and potential uses of the water, the quality may be allowed to degrade somewhat, but never so much as to eliminate or impair the designated beneficial use or uses. The decrement in quality will only be allowed if it is clear that further treatment of the discharge is not feasible and that the public will receive a "maximum benefit" from permitting the discharge. These conditions have only rarely been met in practice.

Whenever a permit or other action involves a surface water, both the federal regulations and Policy 68-16 will be considered. A finding of compliance must be made. If no surface water is involved, only State Board Policy 68-16 is considered.