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CALIFORNIA

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October 23, 2008

Ms. Jeanine Townsend, Clerk to the Board
State Water Resources Control Board
1001 I Street, 24th Floor
Sacramento, California 95814

Dear Ms. Townsend:

Subject: **COMMENT LETTER REGARDING PROPOSED AMENDMENT TO THE POLICY FOR IMPLEMENTATION OF TOXICS STANDARDS FOR INLAND SURFACE WATERS, ENCLOSED BAYS, AND ESTUARIES OF CALIFORNIA TO ESTABLISH WATER QUALITY OBJECTIVES FOR CADMIUM AND RELATED IMPLEMENTATION METHODS**

The City of Los Angeles' Bureau of Sanitation (Bureau) appreciates the opportunity to provide technical comments on the scope and content of the State Water Resources Control Board's (State Board's) environmental information that should be considered in establishing water quality objectives for cadmium and related implementation methods. The Bureau understands that the State Board has requested early public comments by affected parties regarding the range of alternatives to be considered and the potential environmental impacts of those alternatives as part of the California Environmental Quality Act (CEQA) scoping phase of the proposed action.

Although, the Bureau is supportive of the State Board's effort to develop water quality criteria that protect aquatic organisms and designated beneficial uses of the State's water bodies, the Bureau has concerns about the merits of the proposed water quality objective for cadmium and its potential impacts on the City of Los Angeles' wastewater treatment and stormwater facilities. The Amendment as proposed will result in reducing cadmium discharge limits in two of the City's wastewater treatment plants to nearly one tenth of their existing permit limits. It would make it difficult to comply with a permit limit based on this new cadmium water quality objective without the construction of major treatment upgrades. This proposed action merits significant attention since it involves the eventual adoption of a statewide water quality objective for cadmium that will also impact other regulatory actions.

The primary reason provided by State Board staff in its environmental information document for the adoption of revised cadmium water quality criteria is to protect the State of California's threatened and/or endangered species. However, the United States Environmental Protection Agency's (U.S. EPA's) revised cadmium guidance (U.S. EPA, 2001) toxicity tests may not be representative of the species present in the varied waters of our state. The Bureau believes that it is more appropriate for the State Board to select a different alternative than the three proposed by staff in its environmental information document. Instead, an additional alternative should be considered that will develop cadmium criterion based upon species and site conditions that are relevant to California rather than relying on a national cadmium criterion that may be over protective or under protective of local aquatic life.

Attached please find the Bureau's detailed technical comments to aid the State Board in its development of actions, alternatives, and environmental impacts in developing Water Quality Objectives for Cadmium and Related Implementation Methods. If you have any additional questions regarding the Bureau's comments, please contact H.R. (Omar) Moghaddam, Division Manager of the Regulatory Affairs Division, at (310) 648-5423.

Sincerely,

V. Abkian for

ENRIQUE C. ZALDIVAR, Director
Bureau of Sanitation

Attachment 1

w/Attach.
c: Tracy Egoscue, RWQCB
Michael Mullin, Mayor's Office
Rafael Prieto, Chief Legislative Analyst Office
Traci Minamide, Bureau of Sanitation/EXEC
Varouj Abkian, Bureau of Sanitation/EXEC
Masahiro Dojiri, Bureau of Sanitation/EMD
Timeyin Dafeta, Bureau of Sanitation/IWMD
Hiddo Netto, Bureau of Sanitation/WRD
Doug Bohlman, Bureau of Sanitation/TIWRP
Steve Fan, Bureau of Sanitation/HTP
H.R. (Omar) Moghaddam, Bureau of Sanitation/RAD
Shahram Kharaghani, Bureau of Sanitation/WPD

ATTACHMENT

City of Los Angeles, Bureau of Sanitation

Detailed Technical Comments Regarding Proposed Amendment to the Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California to Establish Water Quality Objectives for Cadmium and Related Implementation Methods

US EPA's "2001 Update of Ambient Water Quality Criteria for Cadmium"

In 2006, the Idaho Department of Environmental Quality (DEQ) and the U.S. Geological Survey (USGS) published a scientific investigation report titled *"Cadmium Risks to Freshwater Life: Derivation and Validation of Low-Effect Criteria Values using Laboratory and Field Studies."* The report asserted that developing water-quality criteria for aquatic life following the National guidelines may be under- or over protective at a specific site if the species at the site are more or less sensitive than those included in the data set, or if physical and (or) chemical characteristics of the site alter the biological availability and (or) toxicity of the chemical. To further establish cadmium water-quality criteria specific to the State of Idaho, the study focused on species and conditions that were relevant to Idaho.

The above report also references a study performed on a whole-lake ecosystem by Canadian researchers at the Experimental Lakes Area of western Ontario. The study focused on whether the chronic water-quality guidelines that were based on single-species tests were protective in the wild, and included a 6-year study of the fate and effects of experimental cadmium enrichment on study Lake 382 of the Experimental Lakes Area.

The whole-lake studies of Lake 382 is particularly relevant for the present analysis because (1) the extrapolation of results of single-species laboratory tests to the wild is questionable; (2) the concentrations of cadmium actually achieved in Lake 382 were close to the hardness-adjusted chronic cadmium criteria values for the Idaho Study; and (3) prior to the cadmium additions, Lake 382 was in a near-pristine condition so that changes in aquatic populations and communities from baseline or reference-lake conditions could be attributed to the experimental cadmium additions.

During and following the near-criterion cadmium additions in Lake 382, no overt effects were detected on phytoplankton, zooplankton, macrobenthos, or fish assemblages. Population monitoring of crayfish (*Orconectes virilis*), lake trout (*Salvelinus namaycush*), white sucker (*Catostomus commersoni*), and minnows detected no differences from baseline or reference conditions attributable to cadmium treatments.

The monitoring of *Hyalella azteca* and lake trout populations in Lake 382 are of particular interest. Although some adverse effects were observed in these species in laboratory exposures

at cadmium concentrations less than the chronic criterion derived in the USGS report, no population crash of *Hyalella* occurred. The study of Lake 382 reveals the ability of these species to exist in cadmium concentrations deemed toxic by laboratory standards, and yet still survive within a natural ecosystem.

During Idaho's Rulemaking and Public Comment Summary, the U.S. Environmental Protection Agency commented on the report and stated;

> *"Idaho is proposing an acute and chronic freshwater aquatic life criteria for cadmium, based on work that Idaho DEQ contracted USGS to perform and prepare...*
> *EPA has reviewed the USGS document and applauds Idaho for investing significant resources to derive a [sic] cadmium criteria which incorporates more recent toxicity data than EPA's nationally recommended 304(a) cadmium criteria. EPA believes the USGS document is an excellent piece of work. It is technically solid, well written, and exemplifies a very good alternative approach to adopting EPA's nationally recommended cadmium criteria."*

BUREAU RECOMMENDATION: The State Board should consider performing a study relevant to the unique ecosystem of California before establishing revised water quality objectives for cadmium.

Determination of Hardness Slope

The limiting factor that is reducing the cadmium criteria to near one tenth of its current limit is the chronic criteria. Although the State Board's scoping document recognizes that the EPA's 2001 Updated Cadmium report includes 55 freshwater genera for acute toxicity, and 15 genera for freshwater chronic toxicity, only a few of those genera are used to derive the slopes for both acute and chronic hardness slope. The chronic criterion is founded upon 3 genera, which contain only 3 species, and incorporate only 8 studies to determine the chronic toxicity slope. The development of this chronic slope based upon scarce chronic toxicity data is not reasonable, and brings into question the inherent uncertainties in dealing with statistics and the subjective nature of including and excluding data based upon no set parameters.

BUREAU RECOMMENDATION: The State Board should develop hardness dependent criterion equations using updated toxicity studies, which include a larger data population with species relevant to California.

Hardness

The selection of hardness values to calculate criteria for hardness-dependent cadmium and other hardness related criteria is a concern to the Bureau. The California Toxic Rule (CTR) sets forth water quality criteria for priority pollutants, and hardness criteria are part of the State's water quality standards. In order to derive water quality criteria for cadmium, the CTR requires that

ambient hardness of the receiving water be used when the hardness is less than 400 mg/l. The CTR also requires hardness values used in the criteria calculations to be consistent with the design discharge conditions of the receiving water, which are critical low flow values upon which permit limits are based. Furthermore, the actual establishment of hardness-based metals criteria are set forth in the CTR, and subsequently implemented in NPDES permits pursuant to the State's *Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California* (SIP).

BUREAU RECOMMENDATION: Cadmium Water Quality Objectives should be based on site-specific hardness values because such values are directly linked to derivation of actual criteria.

Water-Effect Ratio (WER)

In 1994, the U.S. EPA published detailed protocols for adjusting its national metals Water Quality Criteria (WQC) to reflect site-specific conditions using the WER. A WER is a factor that indicates the relative toxicity of the metal in the receiving water ("site water") versus the laboratory water on which the criteria are based. The WER uses specified laboratory water and "site water" to determine physical and chemical characteristics in the site water that affect the bioavailability and toxicity of cadmium to aquatic organisms. State Board staff should express cadmium criteria as a value multiplied by a WER consistent with U.S. EPA Metals Policy and as currently shown in the CTR cadmium criteria. Moreover, the State Board should provide guidance to promote statewide consistency in developing WERs.

BUREAU RECOMMENDATION: The policy should include a WER adjustment to the Cadmium Water Quality Criteria in California to reflect site-specific objective studies.

Recalculation of Site-Specific Objective (SSO) Procedure

The1994 U.S. EPA's Recalculation Procedure involves modifying the national dataset of toxicity test results to derive a site-specific dataset using site-specific data to recalculate the pertinent water quality objective(s). This is one of the methods allowed by U.S. EPA for adjusting national water quality criteria to site-specific conditions, while still ensuring the protection of aquatic organisms. The Recalculation Procedure can rely on existing test data, can result in modifications to the criteria by deleting species from the dataset that are not present at a site, and/or can update the national dataset with additional laboratory water tests that meet the requirements for use in calculating national criteria. Three steps are available for recalculation. The first two steps are mandatory. The first step is correction, the second is addition, and the third is deletion. A recalculation study is critical to develop objectives that are representative of local conditions and adequately protective of local species.

BUREAU RECOMMENDATION: Similar to what at least two other States have done, the State Board should consider a recalculation of the U.S. EPA 2001 national cadmium criteria update to determine science-based equations applicable to California. This study

should be completed before the State Board takes formal action to update cadmium water quality objectives.

State Board needs to Consider Economic, Social, Environmental Impacts, and a range of reasonable Alternatives to the proposed action.

When adopting water quality objectives, the State Board must comply with specified provisions of the California Environmental Quality Act (CEQA). Specifically, the State must consider environmental impacts; (Surface Water, GHGs, MF/RO Brine and energy cost); and must analyze a reasonable range of feasible alternatives to its proposed action that would feasibly attain the project objectives. (e.g., Site-Specific objectives, WERs, recalculation, etc).

The Water Boards are under "an affirmative duty to consider economics when adopting water quality objectives in water quality control plans." (Memorandum to Regional Water Board Executive Officers from William R. Attwater, Chief Counsel, January 4, 1994 at p.1.) [1] To fulfill this duty, the State Water Board must assess the costs of the proposed water quality objective for cadmium, including a review of available information to determine:

> (1) Whether the objective is currently being attained; (2) what methods are available to achieve compliance with the objective, if it is not currently being achieved; and (3) the costs of those methods. (*Ibid.*)

If the potential economic impacts of the proposed water quality objective are significant, the State Water Board must articulate why adoption of the objective is necessary to assure "the reasonable protection of beneficial uses of state waters, despite the adverse economic consequences." (*Ibid,*) In making this determination, the State Water Board is to consider information on economic impacts provided by the regulated community.

Before implementing revised cadmium water quality objectives, which could drastically lower effluent limits to $1/10^{th}$ of their current level, CWC Section 13241 requires the Regional Board to weigh the economics and the costs of building new treatment plants to treat stormwater runoff and installing advanced treatment such as MF/RO to the existing POTWs with the environmental benefits, if any, to be gained.

In addition, the State Board is required to consider the need to develop and use recycled water. (Wat. Code section 13241(f).) As noted above, overly stringent cadmium criteria may cause wastewater agencies to divert flows from upstream tertiary plants to ocean discharges, which could affect the amount of recycled water available for use.

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[1] See also *City of Arcadia et al v. State Water Resources Control Board*, Orange County Superior Court Case No: 06CCO2974 (March 13, 2008) (holding that Water Quality Objectives in the Los Angeles Basin Plan could not be applied to stormwater discharges because the Regional Water Board failed to consider the impacts on cities either when the WQOs were adopted or during the triennial review process.)

BUREAU RECOMMENDATION: The State Board must consider Water Quality 13241 factors when developing cadmium water quality objectives.

Environmental and Recreational Impacts

The proposed cadmium criteria could potentially have a significant impact on the number and diversity of animals and plants life in inland surface waterways. Significantly more stringent cadmium water objectives will cause a decrease in concentration based effluent limits and could result in numeric targets for POTWs and MS4 permitties. As a result, diversions of POTW discharges away from receiving waters to ocean outfalls with dilution credits and stormwater runoff to infiltration or newly constructed treatment plants could be expected. Even if advance treatment were constructed, a decrease in the volume of discharges to inland surface waterways would still be expected as brine is diverted to ocean outfalls. This could result in changes to aquatic communities including fish and other dependent wildlife in receiving waters. These diversions could also have a potential impact on the existing recreational areas and activities. This could result in major impacts or changes to water-related recreational activities such as bird watching, fishing, and/or hiking.

Compliance with permit limits based on the proposed criteria would require construction of energy intensive Mico-Filtration and Reverse Osmosis (MF/RO) at the Bureau's two interior treatment plants and possible construction of treatment plants to handle urban run off. The construction of MF/RO could increase GHGs by 106,000 tons per year entering our atmosphere and would conflict with the State's goal of reducing GHGs.

Changes to the surface water flow pattern discussed above can also impact underlying groundwater as surface water has a hydrological connection with groundwater. This change can impact both quantity and quality of groundwater.

The State Board needs to carefully examine the tradeoffs of applying a national water quality criteria that could result in the diversion of both tertiary treated municipal discharges from effluent dominated waterways and dry and wet- weather urban run off and potential loss of beneficial uses.

BUREAU RECOMMENDATION: The State Board should consider the environmental impacts of potential diversions and reduction in flows and their impacts to surface and groundwater as well as the potential increase in energy consumption of newly constructed advanced treatment systems.

Economic Impacts

Treatment plants are required to consistently meet technology based secondary treatment standards through proper operation and maintenance of facilities, and are not designed to remove all possible pollutants, e.g., cadmium. The Clean Water Act already mandates industrial

pretreatment programs, which regulates the discharge of industrial wastewater into the City's collection system including metals such as cadmium. However, with new proposed criteria, source control will not ensure compliance with both the POTW discharge and stormwater runoff. The proposed cadmium criteria could result in the need for advanced treatment such as MF/RO. The estimated cost for constructing MF/RO at the Bureau's two interior treatment facilities with a total design capacity of 100 million per day (MGD) could be as much as $350 million, not including potential upgrades to the collection system to account for wet-weather flows and equalization. The State Board should also consider the cost of increased power consumption to operate an MF/RO process. Where available, infiltration of urban runoff will be used to capture dry and some wet-weather events; however, construction of new treatment plants at a considerable cost may be necessary to comply with the new cadmium targets.

BUREAU RECOMMENDATION: The State Board should consider all economic and cost impacts as specified in CWC Section 13241.

Financial Assistance

The proposed cadmium objectives could result in the need for advanced treatment such as MF/RO and construction of new treatment plants for urban runoff. In addition to the capital and operational costs to treat large wastewater and stormwater volumes, the handling and disposal of concentrated brine that will have to be diverted to ocean outfalls must be considered. The burdens of these costs should not be born entirely by local communities. Low interest construction loans or grants should be made available to local agencies. In addition, the adoption of revised cadmium objectives must include authority for compliance schedules of adequate length to accommodate a realistic schedule for design, environmental review, construction and start-up, if existing treatment processes cannot comply with more stringent cadmium objectives.

BUREAU RECOMMENDATION: The State Board should provide construction funding assistance, and a reasonable compliance schedule, for POTWs that will need to upgrade their treatment processes and MS4 that may need to construct new treatment plants to comply with updated cadmium objectives.

State Law Holds the SWRCB to a Standard of Reasonableness when Establishing Effluent Limits

The California Porter Cologne Water Quality Control Act requires the State Board to act reasonable when developing water quality objectives and associated programs of implementation.

Section 13000 states, "The Legislature further finds and declares that activities and factors which may affect the quality of the waters of the state **shall be regulated to attain the highest water quality which is reasonable,** considering all demands being made and to be made on those waters and the total values involved, beneficial and detrimental, economic and social, tangible and intangible.

In addition, the Water Code requires the State Water Board to consider the "environmental characteristics of the hydrographic unit" to which the objectives will apply. (Water. Code section 13241(b).) Given the varied and diverse characteristics of the State's surface waters, it would not be reasonable to apply a single numeric water quality criterion developed to protect naturally flowing streams, lakes and rivers to ephemeral streams or effluent dominant waters (EDWs). The State and Regional Boards should consider and take into account the nature of EDWs in regional waters when developing water quality criteria and when performing water quality assessments and 303(d) listings so as to develop the appropriate requirements in TMDLs and the resultant load and waste load allocations applied in EDWs.

BUREAU RECOMMENDATION: The State Board should consider the specific characteristics of the water body to be regulated including differences between naturally flowing streams and rivers and EDWs when developing water quality objectives for cadmium.

Summary

In summary, the Bureau recommends that cadmium objectives be developed using the most recent toxicity data available; that cadmium objectives be written to explicitly include a WER; that cadmium effluent limits be based on site-specific hardness values; and that the costs and a broad range of potential adverse environmental impacts be fully explored for both the revised cadmium objectives and for a policy on implementation of water quality criteria for hardness-based metals.