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Director

State of California—Health and Human Services Agency
California Department of Public Health



ARNOLD SCHWARZENEGGER
Governor

November 30, 2007

Mr. Martin L. Adams
Director of Water Quality and Operations
City of Los Angeles Department of Water and Power
Box 51111, Room 1449
Los Angeles, CA 90051-0100

Dear Mr. Adams:

This letter is in follow up to the recent discussions we have had with the City of Los Angeles Department of Water and Power (LADWP) regarding the recent discovery of bromate formation in the LADWP distribution system.

The California Department of Public Health's (CDPH) understanding of this situation is as follows:

In the first week of October, 2007, LADWP was alerted to the monitoring results of a commercial customer that indicated the presence of elevated bromate levels in the central Los Angeles distribution system. Acting on this information, LADWP initiated bromate monitoring at several locations in the Los Angeles distribution system to confirm this finding. LADWP determined that elevated bromate levels were limited to a portion of the service area known as the Elysian and Silver Lake Water Quality Areas.

LADWP immediately implemented a comprehensive set of actions to respond to the elevated bromate levels, including notification of the CDPH; initiation of daily monitoring of the affected areas of the distribution system; and research of the possible circumstances causing the bromate formation. LADWP discovered that the unexpected bromate levels were due to bromate formation in open distribution reservoirs that receive groundwater from San Fernando basin wells, which have naturally occurring bromide levels. LADWP then undertook several major operational changes to reduce bromate levels in the distribution system, including, shutdown of the wells in the San Fernando Basin and isolation of Silver Lake and Elysian Reservoirs from the distribution system. As a result of those efforts bromate levels were reduced to less than 10 µg/L, the numerical maximum contaminant level (MCL). The bromate MCL is calculated as a running annual arithmetic average, computed quarterly, of monthly samples collected by the water system. An extensive literature review as well as laboratory tests revealed that the combination of naturally occurring bromide from groundwater sources, residual chlorine, and sunlight in the LADWP open reservoirs were the factors causing bromate

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formation. Research, monitoring, and planning efforts are ongoing to determine future operation of Silver Lake and Elysian Reservoirs and the San Fernando basin wells.

Bromate is currently regulated under the California Code of Regulations (CCR), Title 22, Chapter 15.5 regarding disinfectant residuals, disinfection byproducts, and disinfection byproduct precursors (hereinafter, California DBP Rule). It is important to note that this regulation (and its federal counterpart) assumes that bromate in drinking water is a byproduct of ozone disinfection of drinking water, ozone reacts with naturally occurring bromide in the water to form bromate. Therefore, compliance monitoring for bromate is required at the *entrance to the distribution system* for each treatment plant in the water system using ozone. Compliance is based on a running annual arithmetic average, computed quarterly, of monthly samples collected by the water system. The MCL is exceeded if a system is required to monitor (because ozone treatment is utilized) and if the average of samples covering any consecutive four-quarter period exceeds the numerical MCL. In accordance with the regulatory requirements, LADWP has been monitoring for bromate at the Los Angeles Aqueduct Filtration Plant, which uses ozone for disinfection, and has been in compliance with the bromate MCL since the rule took effect in January, 2002.

Because ozone disinfection is not utilized to treat water in the open Silver Lake and Elysian reservoirs, distribution system monitoring for bromate is not required by regulation. However, now that the mechanism of bromate formation in open reservoirs has been discovered and confirmed, LADWP and CDPH agree that the scope of the California DBP Rule should be expanded to cover certain additional facilities not utilizing ozone disinfectant, including those within the LADWP distribution system.

Towards that objective, LADWP is required to prepare and submit to CDPH a monitoring plan for bromate by **January 2, 2008**. This plan shall consider any open distribution reservoir that receives elevated bromide sources (whether from a groundwater or treated surface water source) as a potential bromate source. Results will be measured in accordance with Title 22, Chapter 15.5. Monitoring will be conducted at locations that represent each reservoir's entrance to the distribution system, an MCL exceedance will be based on a running annual average of the results at each facility. Results shall be reported to CDPH at least quarterly.

Because the MCL for bromate is calculated on a running annual average, the recent elevated bromate levels do not place LADWP in violation of the bromate MCL. However, because there have been confirmed detections of bromate levels exceeding 10 ug/L in the distribution system, CDPH strongly recommends that LADWP inform its customers of the situation and the corrective actions taken by LADWP.

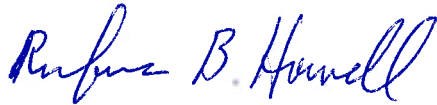
LADWP has already proposed a schedule for the removal or elimination of open distribution system reservoirs pursuant to the Long-Term 2 Enhanced Surface Water

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Treatment Rule. The elimination or removal of the open reservoirs will also have the secondary benefit of eliminating bromate formation in the distribution system.

CDPH would like to commend LADWP for its rapid and comprehensive response to the bromate findings, which represent a previously unknown and unanticipated mechanism of bromate formation in drinking water distribution systems. CDPH also appreciates the timely manner in which it was notified and the frequent communications that have occurred since then. If you have any questions, please contact Kurt Souza, Regional Engineer, at (805) 566-4745 or Jeff O'Keefe, District Engineer, at ((213) 580-3181

Sincerely,



Rufus B. Howell, Chief
Division of Drinking Water
and Environmental Management

cc: Dr. Pankaj Parekh
Department of Water and Power
City of Los Angeles