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Mr. Thomas Carpenter Carpenter.Thomas@epamail.epa.gov
Designated Federal Officer
Science Advisory Board (MC-1400R)
US EPA
1200 Pennsylvania Ave, NW
Washington, DC 20460

Dear Mr. Carpenter:

RE: Public Comment to the United States Environmental Protection Agency Science Advisory Board Perchlorate Advisory Panel Meeting (July 18-19, 2012; Washington DC)

INTRODUCTION

The United States Environmental Protection Agency's (USEPA) charge to the Science Advisory Board (SAB) on Perchlorate cites 1412.b.4.B of the SDWA[1], This section authorizes the USEPA Administrator to set the maximum contaminant level goal (MCLG) at a level at which no known or anticipated adverse effects on the health of persons occur and which allows an adequate margin of safety. The SAB charge statement also calls on the SAB to include in its deliberations "…the totality of perchlorate health information to derive an MCLG for perchlorate." The specific charge questions that follow focus on the health effects from perchlorate exposure, which is consistent with traditional MCLG development. However, perchlorate poses a unique challenge to the traditional MCLG development protocol because it is present in sodium hypochlorite, one of the primary disinfectants used in drinking water treatment to protect consumers from waterborne pathogens.

RECOMMENDATION

As the independent health and technical subject matter experts to the USEPA, the SAB needs to keep disinfection in the forefront of perchlorate MCLG development. The panel should include disinfection as part of the "totality of perchlorate health information". This will avoid inadvertently compromising the disinfection barrier to waterborne pathogens in the application of a perchlorate MCLG and/or MCL.

[1] The quote that appears in the Charge Document is actually from Section 1412.b.4.A, not Section 1412.b.4.B.

The panel may not have the necessary materials to conduct an informed discussion. However, the panel should clearly identify this as an issue that needs to be thoroughly and carefully examined during the MCLG setting process. We suggest including such a comment in the cover letter to Administrator Jackson as part of introductory remarks in your response to the charge questions.

DISCUSSION

The primary view of perchlorate is as a by-product of waste streams from the manufacturing and use of propellants, solid rocket fuel, and, to a lesser extent, fertilizer. The improper environmental release of materials associated with these activities has led to drinking water supply contamination. If, in the course of MCLG development, the spotlight remains solely focused on perchlorate as an industrial contaminant, there could be serious repercussions that could lead to a weakening of current disinfection schemes. Research sponsored by the Water Research Foundation has identified the presence of perchlorate in liquid hypochlorite, one of the primary chemicals used to disinfect drinking water. Should the regulation of perchlorate impact the use of this chemical, it would be an unfortunate and unintended consequence that could adversely effect the health and well being of anyone dependent on a chemical disinfection barrier for protection against waterborne pathogens.

Work by Greiner et. al. (2008) and Stanford et. al. (2011) demonstrated that perchlorate is present in liquid hypochlorite. Their work coupled with work by Gordon et. al. (1995) shows that hypochlorite solutions break down during storage producing chlorite, chlorate, finally stopping at perchlorate. Hypochlorite breakdown begins at the moment of production and continues during transport to and storage at the water treatment plant. Both manufacturers and water utilities (Gordon et al. 1993) have taken steps to minimize hypochlorite breakdown. However, the reaction cannot be halted during storage.

Alternatives to the use of liquid hypochlorite (gaseous chlorine, on-site hypochlorite generation, chlorine dioxide, and ozone) pose their own challenges to water utilities. Among these issues are safety and security (the need to transport and store large cylinders of gaseous chlorine in urban areas), maintenance of production and feed systems (in a 24/7/365 operation), and, in the cases of chlorine dioxide and ozone, the disinfectants carry no residual into and through the distribution system. Hypochlorite is also used in the treatment of distribution system reservoirs and to boost chlorine residuals in the distribution system. In short, hypochlorite is a safe, reliable, and effective tool for combating waterborne pathogens and protecting the distribution system for any size water system.

Any regulatory action that significantly hinders the use or application of hypochlorite, weakens the disinfection barrier thereby diminishing public health protection from waterborne pathogens.

Balancing risks among pathogens, disinfectants, and disinfection by-products (DBPs) is not new. A committee of stakeholders that negotiated the Stage II DBP Rule recognized the nexus between the disinfectants, DBPs, and waterborne pathogens required a careful balancing of risks to avoid weakening the disinfection barrier which could lead to waterborne disease outbreaks. However, unlike the four triihalomethanes and the five haloacetic acids DBPs, which begin forming following the addition of the disinfectant and can be reduced by removal of precursor material, perchlorate is introduced concomitantly with the disinfectant. Perchlorate begins forming when the liquid hypochlorite is manufactured and continues forming during storage.

Thank you for your attention in this matter. If you have any questions please contact Ron Hunsinger (510-287-1338) or Richard Sakaji (510-287-0964).

Sincerely,

Michael J. Wallis
Director of Operations and Maintenance

MJW:RBH:mcw

cc: R. Hunsinger
R. Sakaji

References:

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