December 15, 2011

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

Dear Mr. Carpenter:

In reference to the November 14 Federal Register notice announcing the Environmental Protection Agency (EPA) Science Advisory Board (SAB) Environmental Economics Advisory Committee Augmented for the Consideration of the Value of Water to the U.S. Economy, the American Chemistry Council's (ACC) Chlorine Chemistry Division (CCD) is pleased to submit comments and the appended report[1] , "The Benefits of Chlorine Chemistry in Water Treatment."

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CCD represents major producers and users of chlorine in North America. The Division works to promote and protect the sustainability of chlorine chemistry processes, products and applications in accordance with the principles of Responsible Care®.

Clean water is essential not only for public health but for a healthy economy. For many important uses, the economic value of water is a function of its quality, which is directly related to the efficacy of water treatment. Disinfection in particular plays a critical role in providing high quality water to US consumers. For example, before US cities began treating water supplies with chlorine disinfectants, beginning 103 years ago with Jersey City, thousands of Americans died each year from waterborne diseases, including typhoid fever and cholera. Disinfection also plays an important role in treating wastewater before it is discharged into the environment. This measure helps reduce infectious disease transmission as receiving waters may constitute a source of public water supply or be used for bathing, producing shellfish or irrigating crops.[2]

[1] This report may be found online at http://chlorine.americanchemistry.com/Econ-Water-Treatment.
[2] Water Environment Federation (1996), Wastewater Disinfection, Manual of Practice FD-10, Alexandria, VA.

Chlorine disinfection is a "value-added" technology that contributes to the widespread, low-cost availability of clean water, an important factor in a healthy society and economy.

US residents, institutions and industries benefit from the use of water disinfectants by the avoidance of public health risks that would attend the consumption or dissemination of pathogen-containing water. Water disinfection reduces the risk of waterborne diseases, thereby reducing the personal loss and costs of treating those diseases. These general benefits accrue to consumers regardless of the specific technology used in the disinfection process. According to a report by Whitfield & Associates (2008, see attached and online report), the public benefits specifically from chlorine chemistry used in water treatment, however, because it is more cost-effective than using alternative disinfection techniques.

The extent of the benefits of chlorine chemistry in water treatment was quantified by Whitfield & Associates by determining the additional costs that could be incurred if all the treatment plants that currently use chlorine chemistry in disinfection were forced to substitute alternative technologies, such as ozone or ultra-violet radiation. Using that approach, Whitfield & Associates estimate the total benefit of using chlorine chemistry in water treatment for US consumers is $98.7 billion per year ($109.5 billion for US and Canadian residents combined).

Chlorine is unique among water disinfectants in its ability to provide a residual level of protection from waterborne pathogens; this helps prevent recontamination of water post-treatment. For that reason, EPA requires all municipalities that treat water to maintain a residual level of chlorine in water throughout the distribution system. In the absence of chlorine disinfection, water distribution systems would have to be upgraded significantly, and consumers would be forced to add *point-of-use* treatment options at the tap to protect against recontamination.

If point-of-use systems were required in all US and Canadian households as well as all commercial, institutional and industrial systems served by central water treatment facilities, the total purchase and installed costs could approach $100 billion. Power and maintenance requirements could add a further economic burden of approximately $35 billion per year, underscoring the impracticality of using any technology other than chlorine based disinfectants post-treatment.

When water is not properly treated, potentially serious public health and economic consequences may result.

The Centers for Disease Control and Prevention estimates hospitalizations for three common waterborne diseases cost the US healthcare system as much as $539 million annually and up to $147 million in direct government payments for Medicare and Medicaid[3].

[3] Collier, S.A., Stockman, L.J., Hicks, L.A., Garrison, L.E., Zhou, F.J. and Beach, M.J., *Emerging Problems in Waterborne Disease: Hospitalization Costs of Three Common Waterborne Diseases in the United States* (poster presentation at 2010 International Conference on Emerging Infectious Diseases, Atlanta).

Well-known pathogens such as *E. coli* are easily controlled with routine disinfection, but can cause deadly outbreaks under conditions of inadequate or no disinfection. A striking example occurred in May 2000, in the Canadian town of Walkerton, Ontario. Seven people died and more than 2,300 became ill after *E. coli* and other bacteria infected on of the town's water supply wells. A report published by the Ontario Ministry of the Attorney General concludes that even after the well was contaminated, the Walkerton disaster could have been prevented had chlorine levels been maintained properly. In a 2002 report, The Economic Costs of the Walkerton Water Crisis, author John Livernois estimated the tangible economic costs of the Walkerton water crisis to be over $64.5 million (Canadian dollars). The outbreak, according to Livernois, prevented households and businesses from using municipal water for eight months and placed extreme demands on health and investigative units.

In 2008, the city of Alamosa, Colorado suffered a waterborne disease outbreak that killed one person and sickened at least 435. Prior to the outbreak, the city had obtained a state disinfection waiver. A state report following an outbreak investigation determined that animal waste likely contaminated a compromised holding tank, leading to the outbreak. Routine drinking water chlorination, which has since been implemented, would have prevented the contamination and resulting disease outbreak. A recent study[4] estimates the outbreak to have cost local, regional and state government agencies alone over $450,000.

In conclusion, we trust that these comments help illustrate the essential contribution of disinfection to the economic value of the nation's water supply and the significant "value-added" attributes of chlorinated disinfectants.

For further information, please contact Mary Ostrowski of the American Chemistry Council's Chlorine Chemistry Division (mary_ostrowski@americanchemistry.com), 202.249.6705.

Sincerely,

Judith Nordgren

Managing Director,
Chlorine Chemistry Division
American Chemistry Council
700 2nd Street, NE, Washington, DC 20002
P 202.249.6709
F 202.403.3412

[4] Budge, P., Collier, S., Brinton, W., Cronquist, A., Beach, M.J. and Brunkard, J.M., *Economic and Health Impacts Associated with a Salmonella Serotype Typhimurium Drinking Water Outbreak—Alamosa, CO, 2008* (poster presentation at 2010 International Conference on Emerging Infectious Diseases, Atlanta).