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2006 CLARKE PRIZE RECIPIENT HIGHLIGHTS NEED TO IMPROVE SCIENCE AND POLICY TO CONTROL DISINFECTION BYPRODUCTS IN DRINKING WATER

FOUNTAIN VALLEY, Calif. – The critical need to improve the ability to study, regulate, and implement better management strategies to control the formation of disinfection byproducts (DBPs) in drinking water was highlighted at the Thirteenth Annual Clarke Prize Award Ceremony and Lecture, held by the National Water Research Institute (NWRI) of Fountain Valley, California, on Thursday, July 13, 2006.

The Clarke Prize was awarded to drinking water expert, Philip C. Singer, Ph.D., P.E., the Daniel A. Okun Distinguished Professor of Environmental Engineering at the University of North Carolina at Chapel Hill, for his groundbreaking efforts to understand the formation and control of DBPs in drinking water. As part of the award ceremony, Singer presented the 2006 Clarke Prize Lecture on improving science and policy related to DBPs to better protect public health.

DBPs are formed when chlorine reacts with natural organic matter in water during treatment. Because several DBPs are considered human carcinogens, DBP formation has been one of the most challenging issues within the waterworks industry for over 30 years. Trihalomethanes (THMs) and haloacetic acids (HAAs) are the two major classes of DBPs,

During the lecture, Singer pointed out several inconsistencies and shortcomings in the way we study and regulate DBPs in drinking water. For instance, he noted that most epidemiological studies do not properly assess and characterize DBP exposure. One reason is that many scientists conducting these studies "do not work directly with the utilities whose waters are being investigated," meaning that crucial details, like the timing and manner of data collection or various quality and treatment issues that may have affected DPB levels, are not considered. Singer suggests that if water supply researchers and practitioners all work together on these studies, it would improve DBP research significantly and provide "conclusions that are more scientifically sound and defensible."

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Singer also said that the DBP regulations established in 1979 are flawed and need to be corrected. For instance, the original regulation of THMs was based on the sum of the concentrations of all four species, rather than on the species individually. "When the regulations were first established," said Singer, "there was insufficient data on health effects to establish meaningful contaminant maximum levels. But since that time, a great deal of research has been conducted. It's time to regulate individual species rather than class sums. Only then will we have a regulatory policy that is truly protective of public health." By basing regulations on individual species rather than sums, we can avoid the misrepresentation of DBP risk and exposure to the public, including ensuring that the presence of more harmful compounds in drinking water is accounted for.

Singer concluded his lecture with examples of ways to better manage and permanently control DBP formation in drinking water. "At present, 40 percent of the utilities in the United States use chloramines in their distributions systems to control DBPs," said Singer, but chloramines are not without their problems and can create issues with nitrification and iodinated byproducts. A better solution is to remove natural organic matter, which contributes to the presence of DBPs. This approach, while more expensive and aggressive than other DBP control strategies, has numerous advantages, one of which is a reduction in the overall use of chemicals to treat water that will ultimately lead to lower concentrations of DBPs in drinking water.

Singer is the thirteenth recipient of the Clarke Prize. His pivotal work on DBPs has directly led to the development of water treatment and distribution practices to control DBP levels in drinking water distributed to consumers. His research results were used by the U.S. Environmental Protection Agency in setting regulations for both THMs and HAAs and in identifying coagulation as a best available technology to control DBPs. He has also taken the lead in linking environmental engineering with epidemiological principles to provide an assessment of the effects of human exposure to DBPs in drinking water.

The Clarke Prize was established by NWRI in 1993 to recognize outstanding research scientists who have demonstrated excellence in water-science research and technology. Named after NWRI's co-founder, the late Athalie Richardson Irvine Clarke, the prize includes a gold medallion and $50,000 award.

Copies of Singer's Clarke Lecture may be downloaded at NWRI's website at www.nwri-usa.org.

The National Water Research Institute (NWRI) was founded in 1991 by a group of Southern California water agencies in partnership with the Joan Irvine Smith and Athalie R. Clarke Foundation to promote the protection, maintenance, and restoration of water supplies and to protect the freshwater and marine environments through the development of cooperative research work. NWRI's member agencies include Inland Empire Utilities Agency, Irvine Ranch Water District, Los Angeles Department of Water and Power, Orange County Sanitation District, Orange County Water District, and West Basin Municipal Water District.

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