Public Water Supply Distribution Systems: Assessing and Reducing Risks

Committee

Vernon L. Snoeyink

Chair

Vernon L. Snoeyink (NAE), Chair, is the Ivan Racheff Professor of Environmental Engineering at the Department of Civil and Environmental Engineering, University of Illinois at Urbana-Champaign. Dr. Snoeyink's research interests involve the physical and chemical processes of drinking water purification, including the removal of trace organic compounds by adsorption onto activated carbon and the development of integrated adsorption-low pressure membrane systems for removing particles and trace contaminants from water. His work has also focused on precipitation of solids in water distribution systems and the chemistry of the formation of colored water in corroded iron pipes. He has been a trustee of the American Water Works Association Research Foundation, president of the Association of Environmental Engineering Professors, a member of the editorial advisory board of the Journal of the American Water Works Association, and vice-chair of the Drinking Water Committee of the EPA's Science Advisory Board. Dr. Snoeyink is a member of the National Academy of Engineering and has participated in several NRC committees as either the chair or a member. He has a B.S. in civil engineering, an M.S. in sanitary engineering, and a Ph.D. in water resources engineering from the University of Michigan.

Charles N. Haas

Vice Chair

Charles N. Haas is the L.D. Betz Professor of Environmental Engineering, and Head of the Department of Civil, Architectural and Environmental Engineering at Drexel University. His areas of research involve microbial and chemical risk assessment, chemical fate and transport, hazardous waste processing and disposal practices, industrial wastewater treatment, and water and wastewater disinfection processes. He is currently conducting research on disinfection processes, water microbiology, and microbial risk assessment (including.of special agents) He has co-authored 14 books or major works on water and wastewater treatment and/or microbial risk assessment. He is currently a member of the Water Science and Technology Board and a fellow of the American Academy of Microbiology, the Society for Risk Analysis, and the American Association for the Advancement of Science. He currently serves on the NRC Committee on Public Water Supply Distribution Systems and has formally served on the Panel on Water System Security Research and the Committee on Drinking Water Contaminants. Dr. Haas received a B.S. in biology and an M.S. in environmental engineering from the Illinois Institute of Technology and a Ph.D. in environmental engineering from the University of Illinois.

Paul F. Boulos

Member

Paul F. Boulos is president and COO of MWH Soft. Dr. Boulos is a recognized world-leading expert on water distribution engineering. He oversees worldwide operations and strategic directions from MWH Soft Corporate headquarters with more than 15 years of industry experience, primarily master planning, hydraulic modeling, and regional water quality studies to large IT integration projects. He has written over 100 technical papers and co-authored two books on water distribution systems analysis. He has also served on technical review committees for several municipal drinking water projects throughout the United States and is currently a Consultant to the US EPA Science Advisory Board Drinking Water Committee (Stage 2 Disinfection/Disinfectant Byproduct Rule and Long-Term 2 Enhanced Water Treatment Rule). Dr. Boulos received his B.S., M.S., and Ph.D. in civil engineering from the University of Kentucky and his MBA from the Harvard Business School.

Gary A. Burlingame

Member

Gary A. Burlingame is the administrative scientist of the Philadelphia Water Department’s organic chemistry and aquatic biology laboratories at the Bureau of Laboratory Services, where since 1983 he has been involved in a wide range of operational and distribution system activities. He oversees monitoring of drinking water, source water, wastewater, sediment, sludge, and related media for disinfection byproducts, natural organic matter, PCBs, emerging chemicals, VOCs and SOCs, algae, coliform bacteria, and Giardia and Cryptosporidium. Best known for his contributions to taste and odor control of drinking water and odor control at wastewater treatment plants, his current research addresses the issues of watershed monitoring and distribution system quality control. He has participated in the review of the Total Coliform Rule that is currently under development and in the expert workshop on Exposure Assessment of Contamination of Distribution Systems. He is the current chair of The Unsolicited Proposal Review Committee for AWWA Research Foundation. Mr. Burlingame received his B.S. and M.S. degrees in environmental science from Drexel University.

Anne K. Camper

Member

Anne K. Camper is a professor of civil engineering, adjunct associate professor of microbiology, and faculty member of the Cneetr for Biofilm Engineering at Montana State University. She is also Associate Dean for Research and Graduate Studies in the College of Engineering. Her primary research interests are in biofilm formation in low nutrient environments, including microbial physiology and ecology, as well as the persisitence of pathogenic bacteria in biofilms. Application areas are biological treatment of drinking water and microbial regrowth in driniking water distribution systems. She recently participated in the EPA workshop on Exposure Assessment of Pathogens and Toxic Chemicals in Drinking Water Distribution Systems, the outcomes of which are to be coupled with revisions to the Total Coliform Rule. She is presently on the editorial boards of both Microbial Ecology and Biofilms. Dr. Camper received her B.S. and M.S. in microbiology and her Ph.D. in civil and environmental engineering, all from Montana State University.

Robert M. Clark

Member

Robert M. Clark is an environmental and engineering and public health consultant. He has worked with Shaw Environmental and Infrastructure (SE&I) working on homeland security issues and to the University of Cincinnati working on risk assessment methodology for water system vulnerability. He spent over 40 years in government, first for the U.S. Public Health Service Commissioned Corps, and then for EPA where he directed the Water Supply and Water Resources Division for 14 years. Among other things, his research interests have focused on modeling water quality in drinking water distribution systems, including understanding the many factors that can cause the quality of distribution system water to deteriorate such as the chemical and biological quality of source water, the effectiveness and efficiency of treatment processes, the adequacy of the treatment facility and storage facilities, distribution system age and design, the maintenance of the distribution system, and the quality of treated water. He received the 2004 Lifetime Achievement Award from the American Society of Civil Engineers' Environmental & Water Resources Institute. Dr. Clark holds a B.S. in civil engineering from Oregon State University; a B.S. in mathematics from Portland State University; a M.S. in mathematics from Xavier University; an M.S. in water resources and environmental planning from Cornell University; and a Ph.D. in environmental engineering from the University of Cincinnati.

Marc A. Edwards

Member

Marc A. Edwards is the Charles Lunsford Professor of Civil Engineering at Virginia Polytechnic and State University. Prior to joining the faculty at Virginia Tech, he was an assistant professor at the University of Colorado in Boulder and a senior engineer with Montgomery Engineers. Dr. Edwards is the current president of the Association of Environmental and Engineering Science Professors. His research interests are internal corrosion processes in home plumbing, water treatment, scaling, arsenic removal, and applied aquatic chemistry. The White House honored him in 1996 with a National Science Foundation Presidential Faculty Fellowship, an award that was given to only 20 professors annually. In 2003 he was awarded the Walter Huber Research Prize from the American Society of Civil Engineers. Dr. Edwards received a B.S. in biophysics from the State University of New York and an M.S. and a Ph.D. in environmental engineering from the University of Washington.

Mark W. LeChevallier

Member

Mark W. LeChevallier is chief scientist for innovation and technology at the American Water Corporate Center in Voorhees, NJ, which owns and operates numerous drinking water utilities throughout the United States. His research involves a wide area of issues in drinking water distribution systems, including bacterial regrowth, disinfection of biofilms, corrosion, bacterial nutrients, AOC measurement techniques, biological treatment, Mycobacterium, microbial recovery and identification, the impact of pressure transients on water quality, and detection, treatment, and survival of Giardia and Cryptosporidium. He recently participated in an expert workshop on Exposure Assessment of Contamination of Distribution Systems, which resulted in several white papers that formed the basis for the current study. Dr. LeChevallier currently serves as the Chair of the AWWA Microbial/Disinfection By-Product Technical Action Workgroup and is a trustee of the AWWA Water Science and Research Division. He received his B.S. and M.S. degrees in microbiology from Oregon State University and his Ph.D. in microbiology from Montana State University.

L. D. McMullen

Member

L. D. McMullen is the CEO and general manager of the Des Moines, IA, Water Works where, among other accomplishments, he supervised one of the Upper Midwest’s largest “design and build” concept water plant projects. Dr. McMullen served two terms as Chair of the National Drinking Water Advisory council of EPA and on the Science Advisory Board’s Drinking Water Committee. He has served as a diplomat for water supply/wastewater issues for the American Academy of Environmental Engineers, as the Water Industry Delegation Leader to China for the Citizen Ambassador Program, and was an executive committee member of the Board of Trustees of the American Water Works Association Research Foundation. In 1994 Dr. McMullen received the President's Award of the Association of Metropolitan Water Agencies. He received his B.S. in civil engineering and an M.S. and Ph.D. in environmental engineering from the University of Iowa.

Christine L. Moe

Member

Christine L. Moe is an associate professor of infectious diseases in the Department of International Health at the Rollins Schol of Public Health at Emory University. Previously she was an assistant professor in the Department of Epidemiology, University of North Carolina, Chapel Hill. She received her Ph.D. in environmental sciences and engineering from the University of North Carolina and has done extensive laboratory and field research on waterborne transmission of infectious agents and diagnosis and epidemiology of enteric virus infections. She is a member of the WSTB and also served as a member for the NRC Committee on Evaluation of the Viability of Augmenting Potable Water Supplied with Reclaimed Water and the Committee on Watershed Management for New York City.

Eva C. Nieminski

Member

Eva C. Nieminski is an environmental research engineer at the Utah Department of Environmental Quality Division of Drinking Water, where she provides technical assistance to 50 water treatment plants in Utah. She is also an adjunct associate professor in the department of civil and environmental engineering at Utah State University. Her research focuses primarily on treatment of drinking water, including pathogen passage during filtration, UV disinfection, the application of surrogate measures to improve treatment plant performance, Giardia and Cryptosporidium removal via conventional treatment and direct filtration, ozone pilot studies, disinfection byproduct studies, and a TOC study in surface water treatment plants. She serves as a trustee of the AWWA Water Quality Technology Division. In the regulatory arena, she has represented the Association of State Drinking Water Administrators on negotiated rule making for the Disinfection Byproducts and Enhanced Surface Water Treatment Rule, as well as ECOS for Stage II Disinfection Byproductsand Long-Term Enhanced Surface Water Treatment Rule. Dr. Nieminski received her M.S. in civil and environmental engineering from Warsaw Technical University in Poland, her M.S. in environmental health engineering from the University of Notre Dame, and her Ph.D. in civil and environmental engineering from Utah State University.

Charlotte D. Smith

Member

Charlotte D. Smith is president of Charlotte Smith & Associates, Inc, which provides consulting services to drinking water utilities nationwide. Before establishing Charlotte Smith & Associates, Inc., Ms. Smith worked with the New York City Department of Environmental Protection’s Drinking Water Quality Division, and she was director of Water Quality for United Water Resources (formerly General Waterworks Corp.), which operated 35 drinking water utilities in 15 states. Ms. Smith’s expertise with respect to distribution systems has spanned from understanding the effect of treatment plant practices and chemical and biological stability on distribution system water quality, to disinfectant residual studies, corrosion studies, nitrification control, and distribution system tracer studies. She is a member of the American Water Works Association Distribution System Water Quality Committee (immediate past chair) and Microbial/Disinfection By-Product Technical Advisory Group. Ms. Smith led the development of a Distribution System Self-Assessment Workbook for drinking water utilities. She holds a B.S. in microbiology from the University of Michigan and an M.S. in community health from the City University of New York.

David P. Spath

Member

David P. Spath is chief of the Division of Drinking Water and Environmental Management at the California Department of Health Services, where he has worked since 1972. He is currently responsible for overseeing California's Public Water System Regulatory Program, its Medical Waste Regulatory Program, and the state's Nuclear Emergency Response Program. He is chair of the National Drinking Water Advisory Council and also serves on the California Recycled Water Task Force. He is past president of the Association of State Drinking Water Administrators and served on a steering committee for EPA's environmental technology verification program related to small water systems. He was a member of the recently-concluded NRC study on Water System Security Research. Dr. Spath received his B.S. in civil engineering from Tufts University and his M.S. and Ph.D. in civil and environmental engineering from the University of Cincinnati.

Richard L. Valentine

Member

Richard L. Valentine is a professor in the civil and environmental engineering department at the University of Iowa. He is also a member of the Center of Health Effects of Environmental Contamination. Dr. Valentine's current research interests are in the general areas of environmental chemistry and physical and chemical processes in natural and engineered systems, especially water and wastewater treatment process design and modeling; environmental chemistry/reaction kinetics; processes to remove trace contamination from water; and fate and transformation of hazardous chemicals. His current research related to distribution system issues includes the chemistry of disinfectants and radium and radon in drinking water; mineral dissolution processes; the use of metal oxides as adsorbents in drinking water treatment; and role of the pipe-water interface in the determination of drinking water quality. He received B.S. degrees in chemical engineering and chemistry and an M.S. in chemical engineering from the University of Michigan; and an M.S. and a Ph.D. in civil and environmental engineering from the University of California at Berkeley.