Exponent
One Clock Tower Place
Suite 150
Maynard, MA 01754

telephone 978-461-4600
facsimile 978-461-4699
www.exponent.com

Susan B. Kane Driscoll, Ph.D.

Managing Scientist

Professional Profile

Dr. Susan Kane Driscoll is a Managing Scientist in Exponent's EcoSciences practice. She is an aquatic toxicologist, with 22 years experience in toxicology, specializing in ecological risk assessment, environmental chemistry, sediment toxicity testing, and the toxicity and bioavailability of sediment-associated contaminants to aquatic organisms and wildlife. Dr. Driscoll has directed or participated in numerous ecological risk assessments for RCRA, Superfund, and hazardous waste sites, serving a variety of industrial, utility, and governmental clients. She has extensive experience in designing and conducting laboratory and field aquatic toxicity and environmental fate studies in accordance with rigorous quality assurance practices. She has designed and contributed to numerous environmental programs that were used to develop technically defensible solutions to environmental problems and has negotiated their acceptance with state and federal authorities.

Dr. Driscoll is a specialist in the field of sediment toxicology and her original research and publications in the areas of bioavailability and toxicity of sediment-associated contaminants are widely cited. She has extensive knowledge of sediment toxicity testing, the technical basis and predictive ability of various sediment quality benchmarks, and has served as a reviewer for the development of emerging benchmarks.

Academic Credentials and Professional Honors

Ph.D., Environmental Sciences, University of Massachusetts, 1994
B.S., Natural Resources, University of Rhode Island, 1981

Integrated Risk Assessment Paper of the Year for 2002 for "A Comparative Screening-Level Ecological and Human Risk Assessment for Dredged Material Management Alternatives in New York/New Jersey Harbor," Human and Ecological Risk Assessment 8:603–626

Licenses and Certifications

OSHA Certified Eight-Hour HAZWOPER Annual Refresher Training in Hazardous Waste Operations and Emergency Response, updated annually; OSHA Certified 40-Hours of Training in Hazardous Waste Operations and Emergency Response

Publications

McArdle ME, Kane Driscoll SB, Booth PN. An ecological risk-based cleanup strategy for contaminated sediments in a freshwater brook. Int J Soil Sed Water 2010; 3(2):1–24.

Kane Driscoll SB, McArdle ME, Plumlee MH, Proctor D. Evaluation of hexavalent chromium in sediment pore water of the Hackensack River, New Jersey, USA. Environ Toxicol Chem 2010; 29(3):617–620.

Kane Driscoll SB, McArdle ME, Menzie CA, Reiss M, Steevens JA. A framework for using dose as a metric to assess toxicity of fish to PAHs. Ecotoxicol Environ Saf 2010; 73:486–490.

McArdle M, Ziccardi L, Lowney Y, Kane Driscoll S. Considerations for interpreting nanomaterial toxicity studies for use in environmental risk assessment. Proceedings, International Conference on the Environmental Implications and Applications of Nanotechnology, University of Massachusetts Amherst, pp. 57–60, June 9–11, 2009.

Kane Driscoll SB, Amos BC, McArdle ME, Menzie CA, Coleman A. Predicting sediment toxicity at former manufactured gas plants using equilibrium partitioning benchmarks for PAH mixtures. Soil Sed Contamin 2009; 18(3):307–319.

Kane Driscoll SB, Burgess RM. An overview of the development, status, and application of equilibrium partitioning sediment benchmarks for PAH Mixtures. Hum Ecol Risk Assess 2007; 13:2:286–301.

Kane Driscoll SB, Amos CB, McArdle ME, Southworth B, Menzie CA, Coleman A. Use of Equilibrium Partitioning Sediment Benchmarks (ESBs) to predict toxicity of PAH contaminated sediments. Electric Power Research Institute (EPRI), Palo Alto, CA, 1010371, 2005.

Kane Driscoll SB, Amos CB, McArdle ME, Southworth B, Menzie CA, Coleman A. Sediment biotoxicity at former MGP and coking sites. Electric Power Research Institute (EPRI), Palo Alto, CA; New York State Electric & Gas Corporation, Binghamton, NY; Central Hudson, Poughkeepsie, NY; and PSEG Services, LLC, Newark, NJ, 1011168, 2004.

Kane Driscoll SB, McArdle ME, M.S., Menzie CA, Thompson T, Mortensen L, Fitzpatrick A. Using Polycyclic Aromatic Hydrocarbons in sediments for judging toxicity to aquatic life: Volume I and II, EPRI Final Report. Electric Power Research Institute (EPRI), Palo Alto, CA, 1005280, 2003.

Kane Driscoll SB, Wickwire WT, Cura JJ, Vorhess DJ, Butler CL, Williams LW, Moore DW, Bridges TS. A comparative screening-level ecological and human health risk assessment for dredged material management alternatives in New York/New Jersey Harbor. Hum Ecol Risk Assess 2002; 8(3):603–626.

Vorhees DJ, Kane Driscoll SB, Von Stackelberg K, Cura JJ, Bridges TS. An evaluation of sources of uncertainty in a dredged material assessment. Hum Ecol Risk Assess 2002; 8(2):369–389.

Kane Driscoll SB, Menzie CA, Burton GA, Williams J, Coleman A. Review of toxicology of PAHs in invertebrate aquatic organisms. EPRI Final Report. Electric Power Research Institute (EPRI), Palo Alto, CA, 1006594, 2001.

Landrum PF, Tigue EA, Kane Driscoll SB, Gossiaux DC, Van Hoof PL, Gedeon ML, Adler M. Bioaccumulation of PCB congeners by *Diporeia* spp.: Kinetics and factors affecting bioavailability. J. Great Lakes Res 2001; 27(2):117–133.

Cura, J, Kane Driscoll SB, Lacey R, McArdle ME, Menzie CA. Assessing ecological risks of PAH-contaminated sediments. In: Sediments Guidance Compendium. Electric Power Research Institute (EPRI), Palo Alto, CA, 1005216, 2001.

Kane Driscoll SB, Schaffner SC, Dickhut RM. Toxicokinetics of fluoranthene to the amphipod, *Leptocheirus plumulosus*, in water-only and sediment exposures. Mar Environ Res 1998; 45(3):269–284.

Kane Driscoll SB, Landrum PF. A comparison of equilibrium partitioning and critical body residue approaches for predicting toxicity of sediment associated fluoranthene to freshwater amphipods. Environ Toxicol Chem 1997; 16(10):2179–2186.

Kane Driscoll SB, Harkey GA, Landrum PF. Accumulation and toxicity of fluoranthene in sediment bioassays with freshwater amphipods. Environ Toxicol Chem 1997; 16(4):742–753.

Kane Driscoll SB, Landrum PF, Tigue EA. Accumulation and toxicity of fluoranthene in water only bioassays with freshwater amphipods. Environ Toxicol Chem 1997; 16(4):754–761.

Harkey GA, Kane Driscoll SB, Landrum PF. Effect of feeding in 30-day bioaccumulation assays using *Hyalella azteca* in fluoranthene-dosed sediment. Environ Toxicol Chem 1997; 16(4):762–769.

Kane Driscoll SB, McElroy AE. Elimination of sediment-associated benzo[a]pyrene and its metabolites by polychaete worms exposed to 3-methylcholanthrene. Aquat Toxicol 1997; 39(1):77–91.

Kane Driscoll SB, McElroy AE. Bioaccumulation and metabolism of benzo[a]pyrene in three species of polychaete worms. Environ Toxicol Chem 1996; 15:1401–1410.

Published Abstracts of Presentations

Kane Driscoll SB, McArdle ME, Montgomery C. Case studies of MassDEP Findings on Environmental Risk Characterizations. Co-presented a credited, 8-hour short course to Massachusetts Licensed Site Professionals Association, Westford, MA, April 27, 2010.

Kane Driscoll SB, McArdle ME, Montgomery C. Improve your understanding of ecological risk assessments to write a better RAO. Co-presented a credited, 4-hour short course to Massachusetts Licensed Site Professionals Association, Westford, MA, February 26, 2009.

Kane Driscoll S, McArdle M, Booth P. Use of Solid Phase Microextraction (SPME) to assess the contribution of PAHs to toxicity of sediments at a former manufacturing plant. Battelle Sediment Conference, Jacksonville, FL, February 5, 2009.

Kane Driscoll S, Gard NW, Ginn TC. Critical evaluation of the applicability of sediment effect concentrations for pcbs in site-specific ecological risk assessments. Battelle Sediment Conference, Jacksonville, FL, February 4, 2009.

Kane Driscoll S, McArdle M, Proctor D. Evaluation of hexavalent chromium in sediment pore water of the Hackensack River, New Jersey. 29th Annual Meeting of SETAC North America, Tampa, FL, November 2008.

Kane Driscoll S, McArdle M, Menzie C. Assessing risk of metals in sediment: Experience in applying the weight-of-evidence approach to aquatic sites contaminated with heavy metals. Sediment Management Work Group Spring Sponsor Forum, Kalamazoo, MI, April 29−30, 2008.

Kane Driscoll SB, Amos CB, McArdle ME, Menzie CA, Coleman AJ. Use of site-specific equilibrium partitioning benchmarks for polycyclic aromatic hydrocarbon mixtures to predict the toxicity of sediment at former manufactured gas plants. 28th Annual Meeting of SETAC North America, Milwaukee, WI, November 11–15, 2007.

Kane Driscoll SB. A methodology for deriving a dietary dose of PAHs that is protective of fish. Platform presentation, International Conference on Remediation of Contaminated Sediments in Savannah, GA, January 22–24, 2007. Session chair: "Bioavailability of Contaminants."

Kane Driscoll SB, McArdle ME, Burmistrov D, Reiss M, Steevens J. A methodology for deriving a dietary dose of PAHs that is protective of fish. 27th Annual Meeting of SETAC North America, Montreal, Canada, November 5–9, 2006.

Kane Driscoll SB, McArdle ME, Burmistrov D, Reiss M, Steevens J. A methodology for deriving a tissue concentration of cyclodiene pesticides that is protective of fish. 27th Annual Meeting of SETAC North America, Montreal, Canada, November 5–9, 2006.

Kane Driscoll SB, Reiss M, Steevens J. Development of a novel dose-based toxicity benchmark for exposure of fish to PAHs. 26th Annual Meeting of SETAC North America, Baltimore, MD, November 16–20, 2005.

Kane Driscoll SB, Reiss M, Steevens J. Development of a database of toxic doses of PAHs to fish. 18th Biennial Conference of the Estuarine Research Federation, Norfolk, VA, October 16–20, 2005.

Kane Driscoll SB, Menzie CA, McArdle ME, Coleman A. Application of site-specific equilibrium partitioning sediment benchmarks for PAH mixtures to manufactured gas plants. 25th Annual Meeting of SETAC North America, Portland, OR, November 14–18, 2004.

Kane Driscoll SB, McArdle ME, Menzie CA, Thompson T, Coleman A. Application of sediment quality guidelines for PAHs to manufactured gas plants. 2nd International Conference on Remediation of Contaminated Sediments, Venice, Italy, 2003.

Kane Driscoll SB, T. Bridges, Cura JJ, M. McArdle, and M. Nelson. A review of comparative risk assessment methods and their applicability to dredged material management decisions. 23rd Annual Meeting of SETAC North America, Salt Lake City, Utah, November 16–20, 2002.

Kane Driscoll SB. Sediment accumulation and toxicity of Fluoranthene to freshwater amphipods. Benthic Ecology Meeting, Columbia, SC, March 7–10, 1996.

Kane Driscoll SB, Landrum PF. Bioaccumulation and critical body burden of Fluoranthene in estuarine amphipods. Society of Environmental Toxicology and Chemistry, Washington, DC, 1996.

Kane Driscoll SB, Landrum PF. Toxicokinetics and critical body burdens of Fluoranthene in amphipod bioassays with *Hyalella azteca* and *Diporeia* sp. Invited talk, Society of Environmental Toxicology and Chemistry, Vancouver, BC, 1995.

Kane Driscoll SB, McElroy AE. A comparison of bioaccumulation and biotransformation of benzo[a]pyrene in three species of polychaete worms. Society of Environmental Toxicology and Chemistry, Houston, TX, 1993.

Kane Driscoll SB, McElroy AE. Biotransformation of benzo[a]pyrene by three species of polychaete. Society of Environmental Toxicology and Chemistry, Cincinnati, OH, 1992.

Prior Experience

Senior Managing Scientist, Menzie-Cura & Assoc., Inc., 1997–2006
Post-Doctoral Research Scientist, Bioavailability and Toxicity of Sediment-Associated Organic Contaminants, Virginia Institute of Marine Science, 1996–1997
Post-Doctoral Research Scientist, Bioavailability and Critical Body Burdens of Sediment-Associated PAHs, National Oceanic and Atmospheric Administration Great Lakes Environmental Laboratory, 1994–1996

Project Experience

Conducted a technical review for Environmental Professionals of Connecticut (EPOC) of the Connecticut Department of Environmental Protection's proposed changes to Connecticut water quality standards.

Revising U.S. EPA guidance on the development of site-specific Equilibrium Partitioning Sediment Benchmarks (ESBs) that take into account reduced partitioning and bioavailability of organic contaminants.

Managing field demonstration project for the Department of Defense using activated carbon to reduce bioavailability of PCBs and methyl mercury in sediments.

Technical reviewer of human health and ecological risk assessments for exposure to mercury at the Nyanza Superfund Site Operable Unit 4 – Sudbury River in Massachusetts.

Project manager for field effort that used passive samplers to demonstrate reduced concentrations and bioavailability of hexavalent chromium in sediment pore water of the Hackensack River, New Jersey.

Managed an ecological risk assessment for dioxin-contaminated soil associated with incinerator waste on the grounds of a former hospital in Washington, DC.

Participated in a review of a major Natural Resources Damage Assessment (NRDA) case at a petroleum refinery. Examined use of sediment and soil screening benchmarks to assess damage to ecological receptors.

Managed a review of the long term trends in fish and shellfish monitoring data for the Massachusetts Water Resources Authority. Conducted a Before-After-Control-Impact (BACI) statistical analyses to examine impacts from relocation of the treatment plant outfall.

Conducted comprehensive review of literature on the toxicity of oil to aquatic wildlife. Developed toxicity reference values for oil based on various approaches, including use of surrogate compounds for oil fractions.

Developing a novel approach for EPA and the U.S. Army Corps of Engineers (the Corps) to assess the toxic effects of dietary and water-borne doses of PAHs to fish. Reviewed literature, summarized data, developed a cumulative distribution of doses, and estimated protective dose levels.

Managed an ecological and human health risk assessment for a RCRA site in Taunton, Massachusetts. Designed extensive sampling and sediment toxicity testing program that demonstrated minimal impact to aquatic organisms and wildlife from exposure to PCBs, mercury, and dichlorobenzenes in surficial sediments.

Conducted research for the Electric Power Research Institute and its utility members on the application of the EPA equilibrium partitioning sediment benchmarks for PAH mixtures to contaminated sediments at manufactured gas plant sites. Research examined influence of

various forms of "black carbon," including coal tars and coke, on reducing bioavailability and toxicity of PAHs in sediment to aquatic organisms.

Managed an ecological and human health risk assessment for a former automobile battery manufacturing site in Connecticut. Characterized potential exposure of human and ecological receptors to lead in surficial sediments of a tidal river. Designed field-sampling program, which included analyses of lead in fecal samples and eggs from resident birds, for characterization of site-specific exposure to lead. Used site-specific exposure information to back-calculate health-protective concentrations of lead in sediment.

Managed an extensive review of the available information on the toxicity of dioxin-like compounds to birds. Compiled a database of dose-response relationships that was used to develop a species sensitivity distribution for effects to avian species.

Prepared a technical review for EPA and the Corps on approaches used to characterize the toxicity of mixtures of organic contaminants to fish. Developed a cumulative distribution of toxic tissue concentrations of chlorinated cyclodiene pesticides to fish.

Conducted effects assessment for the Hudson River baseline ecological risk assessment. Reviewed literature on effects of PCBs and dioxin-like compounds on fish and aquatic wildlife. Selected toxicity reference values for use in ecological risk assessment.

Developed a comparative risk assessment framework for the Corps. The framework identifies characteristics of various placement and treatment alternatives for dredged materials that contribute to potential environmental risk. The framework can be used by environmental managers to identify important transport and fate mechanisms and routes of potential exposure, and to illustrate the need for a comprehensive site assessment.

Examined environmental impacts associated with the release of a plume of high pH groundwater from an industrial landfill. Assisted in the development of a sampling program to demonstrate that high pH groundwater was not mobilizing naturally occurring metals in soil.

Advisory Boards

- Task Group Leader for review of American Society of Testing Materials (ASTM) standard "Guide for Determination of the Bioaccumulation of Sediment Associated Contaminants by Benthic Invertebrates." Responsible for revision and updating of standard bioaccumulation test method.

Peer Reviewer

- *Environmental Toxicology and Chemistry*
- *Integrated Environmental Assessment and Management*
- *Journal of Human and Ecological Risk Assessment*
- *Archives of Environmental Contamination and Toxicology*

Professional Affiliations

- Society of Environmental Toxicology and Chemistry (member, editorial reviewer and former member of the Board of Directors for the North American Chapter)
- Representative, SuAsCo (Sudbury, Assabet, Concord Rivers) Watershed Community Council