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Saud S. Al Oud has a Ph.D. in Soil Environmental Chemistry and is a professor in the Soil Sciences Department at King Saud University. His main research interests include phases and components of the soil-water-plant stem, the behavior of elements added to soils from wastes and contaminants, and treatment techniques for the remediation of heavy-metal-contaminated soils. Al Oud works as an environmental consultant for mining firms in Saudi Arabia, and is also the consulate for the water municipality of the Qassim region of Saudi Arabia.

Nakisa Alborz is a LEED accredited professional with a specialty in building design and construction. She earned her Ph.D. in Civil Engineering from Worcester Polytechnic Institute (WPI) in Worcester, Massachusetts. Her Ph.D. research was on developing a post occupancy evaluation framework with a focus on LEED certified residence halls. Dr. Alborz is also an Assistant Professor at Wentworth Institute of Technology (WIT), her alma mater, in the Department of Civil Engineering and Technology in Boston, Massachusetts. Her professional work experience entails over twelve years of cost estimating, scheduling, and civil design works for consulting companies and construction contractors in the areas of heavy civil infrastructure, residential, and commercial properties. She is one of the 2013 recipients of the AACE International U.S. Scholarship Competition. She has previously presented at AACE's first International Total Cost Management Conference in Dubai, UAE; AACE's 56th Annual Meeting in San Antonio, Texas; and Sustainable Buildings Conference in Dubai, UAE. Some of the notable projects she has worked on include the program management of Mount Washington Hotel and Resort Improvements in Bretton Woods, New Hampshire, which won the CMAA 2009 award for Program Management of the Year; and Honolulu High Capacity Transit Corridor Project in Honolulu, Hawaii.

Janet Anderson is a human health toxicologist and environmental risk assessor with fifteen years of experience providing toxicology expertise and oversight of risk assessments executed under CERCLA and RCRA jurisdiction, and conducting high-level technical review of federal and state agency toxicology and risk assessments. Dr. Anderson specializes in the translation of human health toxicology into state and federal environmental regulations and assessing the impact on cleanup decisions. Previously, she developed and led the U.S. Air Force (USAF) Emerging Issues/Contaminants Program, provided technical oversight of environmental remediation research projects, and prepared briefings to senior management of the USAF and the U.S. Department of Defense (DOD) on changes in toxicity standards and environmental regulations. Dr. Anderson was a postdoctoral fellow for the Environmental Protection Agency (EPA) Office of Research and Development National Center for Environmental Assessment, where she served as Chemical Manager for numerous EPA Superfund chemical assessments and as a team member for several Integrated Risk Information System (IRIS) assessments. She has firsthand knowledge of EPA risk assessment guidance and policies, as well as how to conduct hazard identification, dose-response assessment, and the derivation of toxicity values to protect human health. Dr. Anderson is proficient at internal and external technical and lay communications, including oral presentations, training workshops, and written documentation. She has been published in numerous peer-reviewed journals and was an invited lecturer for USAF Institute of Technology Environmental Restoration courses.

Paul Anderson is a Vice President and Principal Scientist at ARCADIS and is also an adjunct professor in the Center for Energy and Environmental Studies within Boston University's Geography Department. Dr. Anderson has over twenty-eight years of experience in human health and ecological risk assessment. He received his B.A. in Biology from Boston University in 1978, his M.A. in Biology from Harvard University in 1981, and his Ph. D. in Biology from Harvard University in 1983. Dr. Anderson has performed numerous multimedia, multichemical, and multipathway risk assessments for federal and state superfund sites throughout the United States, including operating and abandoned chemical and manufacturing facilities, landfills, former woodtreating sites, and pulp and paper mills. He is a leading advocate of advanced risk assessment techniques such as Monte Carlo analysis. Dr. Anderson has written over thirty papers and lectured widely on ecological and human health risk assessment, and has testified throughout the United States on potential environmental risks.

Trevre Roys Andrews has ten years of experience in NAPL site management and closure. He has recently supported the publication of the ASTM methodology, *Standard Guide for Estimation of LNAPL Transmissivity*, providing the cornerstone for LNAPL mobility metrics. He has applied these LNAPL

techniques on over 100 sites across the globe focusing on the development of site conceptual models, remedial goals, practicable technology implementation, and concrete paths toward site closure. These LNAPL sites include retail, rail, refinery, terminal, pipeline, exploration, and utilities. Additionally, he works on Manufactured Gas Plants with DNAPL and innovated chlorinated remedial system design including ISCO with recirculation. He has recently presented on new methodologies for applying Transmissivity as a metric to DNAPL. He is involved with the implementation of new guidance and regulations related to NAPL contaminated sites in a variety of states including Michigan, Minnesota, Virginia, and Iowa.

Kent Armstrong has over thirty-five years of experience working in the environmental industry, with which he has been afforded the chance to participate in a wide variety of environmental investigation, remediation, and management activities. His beginnings started as a waste water treatment plant chemist for the L.A. Sanitation District while attending graduate school for Vertebrate Paleontology at Cal State University Long Beach (CSULB). Transferring within the District to become a plant operator while teaching Human Anatomy at CSULB, he was presented with a chance to incorporate his chemistry and biology backgrounds with facility operations and truly learn the workings of the plant. After three years with the District, next were five years as a hazardous waste mobile chemist analyzing soil and groundwater samples on-site at remediation projects throughout California, Nevada, and Oregon. Next were several years performing RI/FS work for the largest independent landfill company in Southern California; and then a trip east to Connecticut, where for six years he worked with the CTDOT designing and managing environmental remediation projects for major highway, railroad, and bridge rehabilitation projects throughout the 1990's. Since then his work experiences have included hazardous waste transportation/disposal brokering and five years with Lowes Home Improvement providing PCB, PHC, and cVOC soil and groundwater management and remediation services at new store construction sites. Most recent was his joining forces in 2008 with Master Plant Products, Inc. of Brampton, Ontario, Canada. Together, they developed BioStryke® Remediation Products LLC and a line of biostimulation additives designed to leverage existing site conditions to realize low-impact and safe, cost-effective, and sustainable remediation of groundwater, saturated, and vadose soil contaminants.

Ernest Ashley is a professional geologist with over thirty years of experience specializing in hydrogeological and hazardous waste site investigations. Throughout his consulting career, Mr. Ashley has worked on sediment sites contaminated with mercury, chlorinated solvents, MGP wastes, and PCBs. He is a Licensed Site Professional in Massachusetts, a Licensed Environmental Professional in Connecticut, and an American Academy of Environmental Engineers Board Certified Environmental Scientist. He is involved with vetting new site characterization technologies and approaches through the Interstate Technologies Regulatory Council (ITRC) and the University Consortium for Field-Focused Groundwater Research.

Charlotte Atti has a B.S. in Biochemistry from Ithaca College and is currently earning an M.S. in Environmental and Forest Biology from SUNY-ESF. Her specific program of study is Plant Science and Biotechnology. Phytoremediation is her main interest and she is designing a project with Dr. Lee Newman. The project will examine the potential of wetland plants to take up and degrade trenbolone, a growth-promoting steroid hormone given to beef cattle. Hopefully this study will produce information about which plant species would be valuable to utilize in a treatment wetland for feedlot wastewater.

Ralph S. Baker, Ph.D. is the Chairman and Chief Scientist of TerraTherm, Inc., a thermal remediation firm located in Gardner, Massachusetts. A Certified Soil Scientist with an M.S. in Soil Chemistry and a Ph.D. in Soil Physics, he has thirty-five years' experience in the evaluation, design, and implementation of technologies for in-situ and on-site treatment of wastes in soil and groundwater. Dr. Baker has served as an expert on a wide range of innovative physical, chemical, and biological treatment technologies, as a consultant to the industry and government. Over the past seventeen years, and particularly since co-founding TerraTherm, Inc. in 2000, Dr. Baker has focused his attention on application of in-situ and ex-situ thermal remediation of contaminated soils via simultaneous application of heat by thermal conduction and vacuum. He has authored over seventy scientific publications on in-situ/on-site remediation and soil physics.

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Raymond Ball, Ph.D., PE, LSP is President and Principal Engineer at EnChem Engineering, Inc. in Newton, Massachusetts. He has over thirty years of consulting experience in the environmental industry that includes industrial wastewater treatment, hazardous waste treatment, and technology development. As Principal Investigator for two federally funded research projects, he has developed and patented two innovative chemical oxidation technologies known as OxyZone and OxyZone-C. As a consultant, he has provided remedial design services on petroleum and hazardous waste sites ranging from U.S. EPA National Priority List (NPL) sites to private and public sector Massachusetts Contingency Plan (MCP) sites. He holds a Ph.D. in Environmental (Chemical) Engineering from Northeastern University, an M.S. in Environmental Engineering from the University of Michigan, and a B.S. in Civil and Environmental Engineering from the University of Cincinnati.

Kathleen Baskin is the Director of Water Policy at the Massachusetts Executive Office of Energy and Environmental Affairs (EEA). She develops and implements state water policy on issues such as flow and habitat alteration, stormwater management, water quality, and water supply allocation. She is a leader on the Commonwealth's climate change adaptation initiative, convening the Massachusetts Climate Change Adaptation Advisory Committee, managing preparation of the Massachusetts Climate Change Adaptation Report, and chairing the Adaptation Subcommittee of the Global Warming Solutions Act Implementation Advisory Committee. She was also EEA's lead advisor for the Massachusetts Sustainable Water Management Initiative, promoting protection and sustainable management of water resources for ecological needs and economic development. Kathleen has worked in the governmental, consulting, and not-for-profit sectors for over twenty-five years developing policies; conducting technical analyses; promoting education; and advocating in the areas of climate change preparedness, environmental protection and restoration, water resources, and sustainability. Kathleen has an M.S. in Environmental Engineering and B.S. degrees in Civil Engineering and Biology from Tufts University.

Patrick W. Beatty, Ph.D., DABT is a Scientific Advisor in the Regulatory and Scientific Affairs Directorate at the American Petroleum Institute (API). He has a Ph.D. in Biochemistry and is a Diplomate of the American Board of Toxicology (DABT 1994-2014). Dr. Beatty has over thirty years of experience in the petroleum industry as a toxicologist for Shell and Chevron. As a product toxicologist, his primary areas of responsibility have included benzene, asphalt products, and petroleum coke, among others. He has participated in the RCRA based remediation of a petroleum refinery. At API Dr. Beatty staffs compound specific committees on benzene, naphthalene, and PAHs, as well as general toxicology issues. He participates in a multi-industry coalition (ARASP) advocating for improvement in human health risk assessment practices in EPA.

Alice Blayney, EIT, is an Environmental Remediation Engineer at GZA GeoEnvironmental, Inc. in Norwood, Massachusetts. She earned her B.S. and M.S. degrees in Civil and Environmental Engineering from Stanford University. Her experience includes investigatory and remedial activities at a wide range of chemical and nuclear sites, including serving as a lead project engineer of a tritium release investigation at a nuclear power plant. In addition to soil and groundwater monitoring projects, she also participates in soil vapor intrusion assessments conducted under guidelines of the Massachusetts Contingency Plan. Alice's remediation experience includes in-situ chemical oxidation and groundwater extraction.

Paolo Boffetta holds an M.D. from the University of Turin in Italy in 1984 and has been a Licensed M.D. in Italy since 1985. He obtained his M.P.H. at Columbia University in New York in 1988, and got a Specialization in Public Health from the University of Turin the same year. Dr. Boffetta interned at the University Hospital in Turin from 1982-1984. He was a Professor of Clinical Epidemiology at the University of Heidelberg in Germany from 2003-2004. From 2004-2009 he was the Coordinator of the Genetics and Epidemiology Cluster for the International Agency for Research on Cancer within the World Health Organization, and from 2009-2013 he was the Vice President of Research at the International Prevention Research Institute, both in Lyon, France. Dr. Boffetta was also an Honorary Professor at the College of Medicine in Dentistry and Nursing at the University of Dundee in the United Kingdom from 2009-2012. He has been the Director of the Institute for Translational Epidemiology, Associate Director for Population Sciences, and Professor at The Tisch Cancer Institute at Mount Sinai School of Medicine in New York since 2009. Currently, he holds several other positions, including Adjunct Professor in the Department of Medicine at Vanderbilt University in Tennessee (since 2002); Affiliate in the R. Samuel

McLaughlin Centre for Population Health Risk Assessment at the University of Ottawa, Canada (since 2009); Senior fellow at the Hellenic Health Foundation in Athens, Greece (since 2009); Adjunct Professor at the Department of Epidemiology at Harvard School of Public Health in Boston, Massachusetts (since 2009); and Adjunct Professor at the Department of Public Health at the Catholic University of Sacred Heart in Rome, Italy (since 2014). Dr. Boffetta has been the referee for sixty-nine different scientific journals since 2005, including *BMJ, JAMA, JNCI, Lancet, Nature Review Cancer,* and *NEJM*. He is also the Associated Editor of five journals, a member of the editorial board of nine additional journals, and a member of review panels at NIH and other medical research agencies in Europe. He has edited thirteen books and ten journal supplements. He has authored twenty editorials, 970 peer-reviewed publications in international journals, sixty-four book chapters, and thirty-three letters to the editor.

Andrea Bohmholdt (pronounced "bomb-holt") has been successfully performing economic analyses for government agencies, private, and non-profit organizations for over thirteen years. She has been working for AECOM, formerly URS, for the past few years. Prior to working for AECOM, she managed the Renewable Energy Portfolio Standard (RPS) for the State of Maryland and was also the Maryland Technical Representative for the Regional Greenhouse Gas Initiative (RGGI). She authored the book *101 Ways to Reduce Your Carbon Footprint*. Andrea has an M.S. in Applied Economics specializing in Natural Resource and Environmental Economics from Utah State University and a B.S. in Economics from the University of Utah.

Carol de Groot Bois, M.P.H., LSP, founded Bois Consulting Co., Inc. in Framingham, Massachusetts, in 1998. Ms. Bois has managed hazardous waste site investigation and remediation projects nationally and internationally for over twenty-five years. Her work includes Superfund, RCRA Corrective Actions, Brownfields, and ASTM Phase 1/Phase 2 due diligence projects at a variety of industrial, commercial, and residential properties, as well as environmental consulting work for non-profit organizations and municipalities. She is a Massachusetts Licensed Site Professional (LSP) and former President of the Massachusetts LSP Association. Prior to her work as a consultant, Ms. Bois was the Section Chief of the Site Assessment Branch in MassDEP's Central Region Office in Worcester, Massachusetts. Ms. Bois has a B.A. in Biology from the University of Rochester and an M.P.H. (Environmental Health) from Boston University School of Medicine. She is currently an active member of the LSP Association and is on the Scientific Advisory Board for the Annual International Conference on Soils, Sediments, Water, and Energy.

Erica Bosse is a project manager at Sanborn, Head & Associates, Inc., where she has over twelve years of experience in hydrogeologic and environmental investigations. Her work includes extensive investigations of chlorinated volatile organic compound (VOC)-impacted properties, with a particular focus on vapor intrusion; including supervision of long-term monitoring projects, evaluation and interpretation of indoor air and soil vapor data, and detailed vadose zone characterization and other "second generation" site characterization techniques. She has been involved in the completion of Phase I and II Environmental Site Assessments for manufacturing facilities throughout the United States and overseas. Ms. Bosse received her B.A. in Geology from Smith College in 2002, and works both at Sanborn Head's Latham, New York office and her home in western Massachusetts. She is a licensed Professional Geologist in Texas.

Michael Brown is a Vice President of WSP | Parsons Brinckerhoff. Dr. Brown has over thirty years of experience in environmental consulting. His areas of expertise include investigation and remediation of soil and groundwater contamination, regulatory compliance, groundwater and surface water hydrology, human health risk assessment, and mathematical modeling. Dr. Brown is a Licensed Site Professional in Massachusetts, a Licensed Environmental Professional in Connecticut, and a Certified Professional in Ohio. He previously served as an environmental advisor to Senator Daniel P. Moynihan on the staff of the U.S. Senate Environmental and Public Works Committee. He received an A.B. in Astrophysics and a Ph.D. in Environmental Engineering from Harvard University.

Matthew Burns is a Practice Leader for WSP | Parsons Brinckerhoff based in Woburn, Massachusetts. He manages WSP's Advanced Site Closure Program, a specialty services area involving the use of innovative advanced characterization technologies for optimizing the design, management, and closure of

sites. Matt has twenty years of professional chemistry and engineering experience and has authored numerous publications and platform presentations. He holds a B.S. in Environmental Science from the University of Massachusetts Amherst and an M.S. in Civil/Environmental Engineering from the University of Maryland at College Park.

Brandt Butler has over thirty-seven years of experience as an environmental engineer and manager in the petrochemicals and petroleum industries. For the past twenty-one years, his responsibilities have included regulatory strategy development, bioremediation, sustainable remediation, and program management. Dr. Butler is a former Trustee and Treasurer of the Sustainable Remediation Forum (SURF), a professional organization dedicated to bringing sustainability considerations into all phases of site remediation. Currently, he is the Director of the Global Green and Sustainable Remediation Technical Practice Area for AECOM.

Chris Campany, AICP is the Executive Director of the Windham Regional Commission based in Brattleboro, Vermont. The Windham Region consists of twenty-seven towns within a 920-square mile area of Southeastern Vermont. The purpose of the commission is to assist towns to provide effective local government and work cooperatively with them to address regional issues. Prior to his tenure at the Windham Regional Commission, Chris was an Assistant Professor of Landscape Architecture and Graduate Program Coordinator at Mississippi State University; Deputy Director of Planning and Zoning, and Zoning Officer, for Calvert County, Maryland; Deputy Commissioner of Planning for Orange County, New York; Federal Policy Coordinator for the National Campaign for Sustainable Agriculture in its work on the 2002 Farm Bill; founder and Executive Director of the Baton Rouge Economic and Agricultural Development Alliance in Louisiana; and a Program Analyst and Presidential Management Intern with the U.S. Environmental Protection Agency in Washington, D.C. Chris holds a B.A. in Political Science and a Master of Public Policy and Administration from Mississippi State University, and a Master of Landscape Architecture from Louisiana State University. He is a Certified Planner through the American Institute of Certified Planners.

Lisa Campe has extensive experience managing and supervising a variety of risk assessment projects, specializing in both MassDEP risk assessments under the Massachusetts Contingency Plan (MCP) and the U.S. EPA risk assessments under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), the Resource Conservation and Recovery Act (RCRA), and the Toxic Substances Control Act (TSCA). In addition, she has conducted risk-based corrective actions throughout the country including New Jersey, New York, Pennsylvania, Michigan, Virginia, and Washington. These assessments included both deterministic and probabilistic evaluation and have often focused on assessment of vapor intrusion and indoor air quality. Ms. Campe has also developed risk-based cleanup goals for the remediation of contaminated buildings, hazardous waste sites, and facility closures, and assisted in the performance of Remedial Investigations and Feasibility Studies and public health exposure evaluations. Based on the results of the evaluations, she has provided assistance to prioritize remedial response actions and associated risk management decisions. She has also negotiated risk-based remedies with regulators and stakeholders and communicated risk assessment and risk management issues to the public. Ms. Campe has also provided technical input for the ongoing redesign of the MCP, and has served on a number of related technical and policy committees, including the MCP Vapor Intrusion Workgroup. She also participated in an external (LSRPA) stakeholder committee for the (ongoing) revision to NJDEP Remediation Standards. Ms. Campe is also a Licensed Site Professional (LSP) in Massachusetts and a member of the Regulations and Legislation Committee of the LSP Association. She lectures frequently on risk assessment topics and presents complex technical information to the public as part of the Public Involvement and Participation (PIP) process. Ms. Campe holds a B.S. in Geology from Duke University and a Masters of Public Health (M.P.H.) from Boston University.

Richard T. Cartwright PE, CHMM (Fellow), CPIM (Fellow) is a Business Development Manager at USA Environment, which provides cost-effective solutions to difficult environmental remediation, ecological restoration, and radioactive health physics-related problems. Rich has an M.B.A. in Operations Management from Indiana University, a B.E.S. in Chemical Engineering from Brigham Young University, and a Professional Certificate in Project Management from the State University of New York at Buffalo. Mr. Cartwright is an internationally-recognized motivational platform speaker and blogger on Soil and

Groundwater Remediation, Hazardous Materials Management, Professional Networking, and Sustainable Career Development topics.

Nicholas Castonguay is a geologist with CDM Smith, Inc. in Boston, Massachusetts. He focuses on site characterization and remediation at hazardous waste sites. Site-specific experience includes hydrogeologic investigations, environmental drilling and sampling, aquifer testing, borehole geophysics, bench scale studies (arsenic), and pilot scale hydrogeological studies. Mr. Castonguay holds a B.S. in Geology from the University of Massachusetts Amherst.

Bridget Cavanagh, Ph.D. is an environmental engineer with XDD Environmental. Bridget specializes in chemical oxidation technologies and is focused on advanced remediation system designs for a variety of chemicals of concern. Bridget also conducts treatability evaluations in XDD's laboratory, including bioremediation, ISCO, and thermal SVE designs. As a recent graduate of Arizona State University, her Ph.D. work focused on the reduction of contaminant emissions from low permeability stratigraphy.

Zhongqi (Joshua) Cheng is the Chair and Associate Professor in the Department of Earth and Environmental Sciences at the Brooklyn College of The City University of New York, and a faculty member for the Earth and Environmental Sciences Ph.D. Program and Macaulay Honors College. Dr. Cheng has a background in environmental and analytical geochemistry, with specific training and expertise in contaminants such as lead and arsenic. His research currently focuses on urban soil contamination and green infrastructure. Dr. Cheng received grants from USDA, NSF, EPA, NIEHS, and NYC DEP for various research projects; and he has been working with agencies, community organizations, and academic peers on soil-related projects. He has authored and co-authored nearly forty peer reviewed articles, many of which are interdisciplinary by nature. In 2009 Dr. Cheng initiated a garden soil screening program and since then developed one of the few nonprofit soil testing labs that are currently providing affordable soil screening services to gardeners in New York City and beyond. Dr. Cheng is the co-founder of the Urban Soil Institute (www.usi.nyc), serves as an advisor for a number of organizations, and is an Associate Editor for the Journal of Environmental Quality.

Jay Clausen is a Physical Research Scientist with the U.S. Army Corps of Engineers in the Engineering Research and Development Center at the Cold Regions Research and Engineering Laboratory located in Hanover, New Hampshire. Mr. Clausen has twenty-five years of research experience and has worked on military range issues for the last decade. His research interests include the fate-and-transport of anthropogenic constituents (chlorinated solvents, PCBs, explosives, perchlorate, metals, and radionuclides), dense non-aqueous phase liquid behavior, monitored natural attenuation processes, innovative remedial and sampling technologies, and climate change issues. His recent research efforts have been focused on the characterization of military ranges, the fate-and-transport of energetic compounds and metals (lead and tungsten), application of quantum structure activity relationship (QSAR) models to predict the environmental behavior of emerging compounds, and applications for the use of laser induced breakdown spectroscopy(LIBS). Mr. Clausen has a B.S. from the University of Nebraska Omaha in Geology, M.S. in Geological Sciences from the University of Maine, and Ph.D. in Natural Resources and Earth System Science from the University of New Hampshire.

Jonathan G. Cooper is Research Director of the Institute for Nuclear Host Communities, a research, planning, and public policy firm based in Amherst, Massachusetts. His work at the institute advances the organization's knowledge base on the socioeconomic impacts of nuclear power plant closure via position papers, literature reviews, case studies, and presentations. He recently received a Master's in Regional Planning (MRP) from the University of Massachusetts Amherst, where he concentrated on industrial land reuse and worked as a research assistant at the Center for Economic Development. In addition to the MRP, Mr. Cooper also holds an M.A. in Landscape Planning from the Conway School and a B.A. in Philosophy and the History of Mathematics and Science from St. John's College in Annapolis.

James Cummings is in the Technology Assessment Branch in the Office of Site Remediation and Technology Innovation at EPA headquarters. Jim has over twenty-five years of experience in the development, evaluation, and deployment of innovative tools for the characterization and remediation of hazardous waste sites. He provides technical support to federal and state RPMs in cleanup of wood

treaters, former Manufactured Gas Plants (MGPs), and chlorinated solvent sites. Building on extensive experience in supporting selection and deployment of in situ thermal technologies, he prepared an EPA report on 'Lessons Learned in the Use of In Situ Thermal Technologies.' Jim has chaired sessions and presented at dozens of domestic and international remediation conferences. Recent interests include the use of combined remedies to exploit synergies among technologies and accelerate site closure. In a collaboration between EPA and the National Groundwater Association, he has moderated and presented at a series of Combined Remedy workshops around the country.

Elizabeth Denly is a Senior QA chemist at TRC with over twenty-five years of experience. Ms. Denly is responsible for providing QA/QC oversight as well as chemistry support in support of a variety of environmental investigations including contaminant ambient air monitoring, delineation, human health and ecological risk assessments, risk-based soil cleanups, and remediation programs. She has provided this oversight under different regulatory programs, including MassDEP, EPA Region I, EPA Region II, NYSDEC, and NJDEP. Ms. Denly has worked closely with MassDEP on several projects. Currently, she is leading the effort, under the direction of MassDEP, to create a VPH by GC/MS method. She is providing support to MassDEP in generating responses to questions received regarding CAM protocols, and she is also providing assistance to MassDEP Audit staff in the generation of audit checklists and training for the evaluation of CAM-generated data. In the past, she has led the effort in conjunction with NEH and under the direction of MassDEP to update the CAM, create new CAM protocols, and provide training for laboratories. Ms. Denly has been an active member of several Work Groups within MassDEP, including the Work Groups for APH, EPH/VPH Revisions, Data Usability, and the original Data Quality Enhancement Work Group.

Richard Desrosiers is a Senior Project Manager, Licensed Environmental Professional, and Licensed Professional Geologist with GZA GeoEnvironmental, Inc. in Glastonbury, Connecticut. He has twenty-eight years of environmental assessment and remediation experience at sites in New England and throughout the U.S. His practice focuses on solving complex hydrogeologic issues (predominantly chlorinated solvents and hexavalent chromium) in unconsolidated and bedrock geologic formations. He has evaluated contaminant fate and transport mechanisms at industrial, military, and RCRA facilities including a facility with groundwater impact over one square mile. Mr. Desrosiers has developed and implemented innovative in-situ technologies to remediate contaminants and is currently involved in developing an in-situ remedial strategy to manage both chlorinated solvents and hexavalent chromium. Mr. Desrosiers has provided expert testimony in support of litigation and has authored technical papers. He received his B.S. in Geology from Northeastern University and pursued graduate level studies at Kent State University. He has completed several professional courses in hydrogeology, modeling, and site characterization.

Paul Dombrowski is a Remediation Technical Leader at AECOM with eleven years of experience who specializes in the design, implementation, and oversight of groundwater and soil remediation projects. His areas of expertise include in-situ remedial technologies, groundwater geochemistry, chlorinated solvent site investigation, and brownfields assessment and redevelopment. He is the leader of AECOM's Environment Technical Practice Network and is a co-founder of the AECOM Chemical Oxidation Technical Practice Group. He attended Manhattan College in New York City where he earned a B.S. and M.S. in Environmental Engineering. He is registered as a Professional Engineer in Massachusetts and Connecticut and serves on the Scientific Advisory Board for the AEHS East Coast Conference.

Maureen Dooley has over twenty-nine years of experience in many aspects of environmental industry including project management, research and development, senior technical oversight, remedial design, and laboratory management. In Ms. Dooley's current position as Director of Strategic Projects at Regenesis, she is responsible for managing both business development and technical support associated with Regenesis bioremediation and chemical oxidation projects. She obtained her B.S in Biology from St. Bonaventure University in New York and M.S. in Biology and Microbiology from the University of Dayton in Ohio.

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Tommaso A. Dragani has over thirty-five years of experience working on chemical carcinogenesis, molecular biology, molecular genetics, and genetic epidemiology, with a major emphasis on the role of genetic predisposition on inherited predisposition to carcinogenicity. He is Director of a research unit of the Istituto Nazionale Tumori, Milan, Italy. He has authored 162 peer-reviewed publications in international journals. He participated as a member of Working Groups of the International Agency for Research on Cancer for the preparation of Monographs on the Evaluation of Carcinogenic Risks to Humans.

Kristen Durocher is a senior ecological risk assessor at AECOM with over twenty years of experience in the field of ecological risk assessment of contaminated sites, with a focus on urban riverine environments. Ms. Durocher specializes in sediment ecological risk assessment, integrating multiple lines of evidence, including aquatic and benthic ecology data, laboratory and in situ toxicity testing, chemistry data, and potential food chain effects. She has experience in all facets of ecological risk assessment, including designing and implementing complex field programs, laboratory toxicity tests and toxicity identification evaluations, data analysis, regulatory negotiation, statistical analysis of data sets, and project management. In addition to developing cleanup goals, Ms. Durocher has worked on projects under several regulatory authorities, including CERCLA sites, comparing site data to background data using various statistical techniques and developing appropriate background threshold values to serve as a baseline for potential risks. Ms. Durocher received a B.A. from Middlebury College in Vermont with a double major in Northern Studies and Environmental Studies.

Mark Eiseman is the Operations Manager for Geotech Computer Systems in Centennial, Colorado. He holds a B.A. in Geography from Valparaiso University, with a concentration in Geographic Information Systems and Computer Science. Last year, he completed a Master's in Business Administration - Strategic Management at Regis University. Mark's technical experience is derived from the application of GIS and environmental data management systems within multiple industries for over the past fifteen years, including environmental, human health, federal and local government, oil and gas, public utilities, transportation, and urban planning. He has developed and managed many projects that have incorporated various technologies to support groundwater, surface water, and soil remediation; construction/demolition activities; radiological site cleanups and superfunds; brownfield redevelopment; regulatory compliance; and providing support for litigation experts in occupational and human health cases. Over the past few years, he has focused his efforts toward designing and implementing GIS-based data management systems that add value to the overall strategic and decision support systems for organizations with environmental challenges.

Stephen Emsbo-Mattingly is a Senior Scientist at the NewFields Environmental Forensics Practice in Rockland, Massachusetts. He has more than twenty-five years of environmental chemistry and forensic investigation expertise. Mr. Emsbo-Mattingly specializes in the source identification of PCBs, PAHs, petroleum, tar, and chlorinated solvent products in the environment. This work is typically conducted in support of site investigations, risk assessments, and liability management.

Kate Engler, Ph.D. is a Senior Environmental Scientist at Apex Companies, LLC, with expertise in analytical chemistry, environmental chemistry, toxicology, and risk assessment. At Apex she has been involved in human health risk assessments and remediation of areas impacted with petroleum and chlorinated solvents, metals, and PCBs. Dr. Engler has extensive experience in analytical chemistry techniques, and she has published her research on a novel method to degrade contaminants in water and on a novel method to assess bioavailability in soil in academic journals.

Sami A. Fam is President of Innovative Engineering Solutions, Inc. He specializes in design, implementation, and optimization of in-situ bioremediation and oxidation technologies. Dr. Fam has a Ph.D. and M.S. in Environmental Engineering from UCLA and a B.A. in Chemistry from Dartmouth College. He is a registered professional engineer in ten states. He is co-author of a book titled In-Situ Treatment Technology (Lewis Publishers, 1996), and has numerous journal publications in the areas of groundwater and soil remediation by biological and other in-situ methods, chlorination by-products, oil and grease analysis, and urban runoff quality. Dr. Fam has been involved in some the first and largest full-scale anaerobic dechlorination system designs and installations in the world.

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Giuseppe Filauro has over forty years of professional experience in the field of environmental protection; in the design and implementation of contaminated soil remediation projects; and in the design, engineering, and construction of treatment plants for liquid, solid, and gaseous wastes. In his professional career, Giuseppe has taken part in projects in the private industry, the public sector, and WB funded initiatives, in the domestic and international markets. He has worked for the petroleum and petrochemical industry, the pharmaceutical industry, the chemical and fertilizer industry, and the pulp and paper industry. He has undertaken projects for the treatment and disposal of Municipal Solid Wastes (MSW) through combustion and energy recovery. He authored and co-authored over twenty publications, which were published and/or presented at national and international conferences. As a lecturer at the Milan University, he has instructed numerous courses in combustion gas treatment. He has been an invited teacher at several post-graduate courses, an invited Speaker or Author at various Conferences in Italy and abroad, and Chairman at international conferences.

Kevin T. Finneran is an Associate Professor of Environmental Engineering at Clemson University in the Department of Environmental Engineering and Earth Sciences. He is also an independent consultant for contaminated site remediation projects for several private clients. He has a Ph.D. in Microbiology from the University of Massachusetts Amherst and a B.S. in Environmental Sciences from Rutgers University. Prior to Clemson, he was an Assistant Professor at the University of Illinois Urbana-Champaign, and a consultant at Geosyntec Consultants in Acton, Massachusetts. His research and consulting work focus on contaminated site remediation, with emphases on novel tools and technologies in site remediation and combined technologies for sustainable remediation. He serves on the scientific advisory board of the AEHS Foundation Annual International Conference on Soils, Sediments, Water, and Energy; and he has been an academic board member of the Battelle Chlorinated Solvents and Site Remediation Conference. In addition, he was an academic member of the Sustainable Remediation Forum (SURF) and the DuPont advisory team for advanced remediation technologies. Finally, Dr. Finneran was awarded a National Academy of Sciences (NAS) Kavli Fellow in 2012, which recognizes young researchers considered leaders in the field.

John Fitzgerald received a B.S. and M.S. in civil engineering from the University of Massachusetts at Lowell, and is a Registered Professional Engineer in Massachusetts. He has been employed by the Massachusetts Department of Environmental Protection (DEP) since 1980, where he oversees the assessment and cleanup of sites contaminated by oil and hazardous materials.

Bob FitzPatrick is the Director of Government Affairs for the Mass Clean Energy Center, where he is responsible for maintaining MassCEC's relationships with all levels of state and local government and advocating for MassCEC policy priorities. Prior to joining MassCEC, Bob worked for ten years in the Massachusetts state legislature, most recently as Chief of Staff to State Senator Patricia Jehlen (D) in Somerville. Bob earned a B.A. in Philosophy from Northeastern University and a Juris Doctorate from Suffolk School of Law.

Katie Flanders is an environmental scientist at NewFields Environmental Forensics Practice. Katie joined the NewFields team after completing her dissertation research in the fields of atmospheric chemistry and organic geochemistry through UMass Boston's Green Chemistry Program. At NewFields she has worked on a range of forensic investigations characterizing the source and extent of environmental contamination.

Olorundare O. Folasayo is member of the Water Research Group in the Department of Applied Chemistry at the University of Johannesburg, under the supervision of Professor T.A.M. Msagati and Dr. N. Mabuba. He has just concluded is doctoral research on the application of waste residue in water treatment. Presently he is a research fellow at the same university. Olorundare has, to his credit, a number of publications on wastes application in water treatment.

Alyson Fortune, Sampling and Analysis Specialist and Project Manager, joined TerraTherm, Inc. in 2012 as a Senior Scientist with over fifteen years of experience in the environmental industry, including experience with source testing, analytical laboratory testing, and environmental consulting. Ms. Fortune

has a B.S. of Science from UMass Amherst as well as an M.S. in Atmospheric Science from UMass Lowell. Currently, Ms. Fortune is acting as the data quality/operations and compliance monitoring discipline lead for the Engineering department. In this role, Ms. Fortune is responsible for developing and implementing sampling and analytical plans and quality assurance project plans (SAP/QAPPs), managing thermal remediation treatability studies and project laboratory interactions, conducting data quality reviews on laboratory data, maintaining complex field equipment monitoring systems (e.g. FTIR), and performing other data management functions.

Avram Frankel is a professional engineer and program manager with twenty-five years of environmental remediation, civil engineering, property transaction support, due diligence, risk management, and project delivery experience. His experience includes work on a wide range of commercial/industrial and public sector sites regulated under numerous federal, local, and state programs. As a principal engineer, he has overseen the design, installation, and execution of a wide range of successful remedial programs, including those with large and complex remediation liabilities. As a former corporate program manager, Mr. Frankel's experience on large and performance-based projects is extensive. Projects have included portfolios for industrial clients as part of strategic contracting efforts including large risk transfer and redevelopment projects. Mr. Frankel now leverages the knowledge and lessons learned from this experience for the benefit of his clients to support implementation of their most important property acquisition, and liability and asset management objectives however great or small. Mr. Frankel also serves as a regulatory strategist, litigation support expert, insurance underwriting/claims support consultant, and owner's representative monitoring and overseeing a variety of client environmental matters.

Deborah Goldblum has worked in the U.S. Environmental Protection Agency's (EPA's) Mid-Atlantic Office (Region 3) RCRA Program for over twenty years. She initiated EPA's cross-agency workgroup to develop a greener cleanup standard, is EPA's liaison to ASTM International in this effort, and has been a project manager and geologist for numerous RCRA Corrective Action sites. Ms. Goldblum is also currently contributing to the development of a more robust national sustainability materials management program. Previous collaborative projects with EPA Headquarters include serving as a primary author for the *RCRA Groundwater Handbook* and developing cross-program revitalization measures for cleanup sites. She received her B.S. in Geology from Haverford College and M.S. in Geology from Temple University.

Vinod Gondkar is a farmer from rural India. He obtained his Diploma in Chemical Engineering from the Bombay Board, B.S. from the University of Pune, M.S. in Energy Management from Devi Ahilya University in Indore, Post Graduate Diploma in Travel and Tourism from University of Pune, and is a rank holder in P.G.D. (T&T) in University. He is pursuing his Ph.D. from Manav Bharati University, also in India.

Philip Goodrum has twenty-five years of experience in quantitative risk assessment and environmental modeling, specializing in probabilistic risk analysis, environmental forensics techniques, dose-response analysis, and natural resource damage assessment. He is an expert on toxicology of PFCs and leads several initiatives to assess and manage emerging contaminants in the environment. He advises clients on alternative approaches for data evaluation, visualization, and statistical analysis. He has consulted on behalf of the U.S. EPA and numerous state agencies including the California Department Toxic Substances Control, California North Coast Water Quality Control Board, Florida DEP, and Utah DEQ. He also serves on EPA's Science Advisory Panel for lead and Interstate Technology and Regulatory Council's Incremental Sampling Methodology workgroup.

Nathan Hagelin is the Practice Area Leader for Environmental Remediation for Amec Foster Wheeler Environment and Infrastructure, Inc. In that role, Mr. Hagelin leads Amec Foster Wheeler's environmental remediation resources, drives technical quality in the delivery of remediation services, develops client technical symposiums and internal training programs, attracts and retains key remediation resources, and leads AMEC's participation in key conferences and trade groups. Mr. Hagelin is a Senior Principal Geologist with environmental consulting experience in both the public and private sectors, and prior experience as a U.S. Geological Survey Hydrologist. His experience includes hydrogeologic

investigations, remedial action planning, remedial technology selection and implementation, solid- and hazardous-waste landfill closures, PCB Remediation, RCRA corrective action, industrial facility closure, litigation support, brownfields redevelopment, and consent agreement/order negotiations. He serves as project manager, technical leader, and senior technical reviewer on projects ranging from site assessments to remedial investigations; RCRA facility investigations; remedial designs and remedial actions; and long term operation, maintenance, and monitoring programs. His areas of expertise include RCRA, TSCA/Megarule, PCB and VOC remediation, hydrogeology, contamination assessments, DNAPL Investigations, remedial investigations, landfill closure, landfill post-closure monitoring and maintenance programs, RCRA Facility Investigations, RCRA facility closures, voluntary corrective actions, technical writing, environmental site assessments, regulatory negotiations, and technical support for litigation.

James A. Hamilton is the Founder and President of the National Spent Fuel Collaborative. Combining experience in plant decommissioning, brownfields redevelopment, and stakeholder interest alignment, Jim provides strategic nuclear decommissioning counsel to the public and private sectors. At the Conservation Law Foundation, Mr. Hamilton advised Yankee Atomic Electric Company on its decommissioning program implementation for its two nuclear plants in Connecticut and Massachusetts. He was also the lead author of the Yankee Rowe Site Closure Project Plan, the first of its kind in the nation and the roadmap for a successful spent fuel management and site closure effort. Jim's brownfields experience includes advising the Town of Pittsfield on its land use and redevelopment negotiations with General Electric and launching Lockheed-Martin's $600 million brownfields redevelopment program in Los Angeles. Jim has also advised Canada's First Nation's communities, served as the Americas Vice President of Sustainability for a multinational mining corporation, and taught at MIT's Environmental Policy Program. He earned his undergraduate and graduate degrees from the University of British Columbia and MIT, respectively. His volunteer work includes serving as Co-Chairman of MIT's Energy, Environment, and Sustainability Global Collaboration Committee.

Melissa A. Harclerode is a project manager at CDM Smith. She has ten years of experience managing and performing environmental projects with an emphasis on site assessments, remedial investigations, brownfields, vapor intrusion, and sustainable remediation. She is an active participant in the Sustainable Remediation Forum (SURF) technical initiatives, which includes leading the Social Aspect of Remediation Initiative. Mrs. Harclerode earned her B.A. in Environmental Science and Biology from Muhlenberg College, M.S. in Environmental Science from Rutgers University in Newark and New Jersey Institute of Technology, and is currently pursuing a Ph.D. in Environmental Management at Montclair State University with a focus in Sustainable Remediation. She is also an accredited Envision^{TM} Sustainability Professional by the Institute for Sustainable Infrastructure (ISI).

Robert Hedin has a Ph.D. in Ecology from Rutgers University. He spent eight years as a research scientist with the U.S. Department of Interior where he investigated mine water geochemistry and treatment technologies. Since 1994 he has been President of Hedin Environmental, a small consulting firm that specializes in mine water assessments and passive treatment systems. In 2000 Iron Oxide Recovery, Inc. was formed to focus on the recovery and sale of iron solids from mine water systems.

John Hinz has a thirty-six year professional career which has combined applied inhalation, general industrial toxicology, and laboratory management with risk assessment and guideline development. Beginning with tours of duty at three contract laboratories, he apprenticed in inhalation toxicology at the Huntingdon Research Center in New York, then became Study Director for inhalation toxicology and was responsible for the design of inhalation systems and execution studies at Food and Drug Research Laboratories in New York. Recruited by BioDynamics and Exxon Biomedical Sciences, he built, staffed, and managed the Inhalation Toxicology Department at Exxon Biomedical Sciences' new laboratory in New Jersey. Applying a practical grounding in toxicology, Mr. Hinz wrote and reviewed RfC- and RfD-based risk assessments in the EPA's Hazardous Pollutant Assessment Branch (Research Triangle Park, North Carolina). Then he joined the Air Force's Institute for Operational Health, now part of the USAF School of Aerospace Medicine, as one of its senior environment, safety, and operational health consultants on toxicology and risk assessment issues. For the last sixteen years of his career, he served as the Air Force's representative and as one of the inhalation toxicologists on the National Advisory Committee for Acute Exposure Guideline Levels for Hazardous Substances (NAC-AEGL). The

Committee's work earned recognition with the Hammer Award from Vice President Albert Gore and the National Partnership for Reinventing Government. His work for the Air Force included a comparative characterization of the potential of various fuels to cause respiratory irritation: advice on the design, execution, and interpretation of key inhalation studies to better characterize the health-related issues associated with exposure to naphthalene, 1,4-dioxane, and natural and synthetic jet fuels. Mr. Hinz also served as one of Department of Defense's subject matter experts on developing risk assessments for naphthalene and 1,4-dioxane. Retired from federal service, he continues to work on these and related issues.

Scott Hogamier has over ten years of environmental laboratory experience as a project manager, marketing analyst, and account management professional in the environmental laboratory testing industry. As an Account Manager with Eurofins Eaton Analytical, Inc. in Kittanning, Pennsylvania, the largest potable water testing laboratory in the U.S., his current responsibilities include providing sales and service for public/private water companies and consultants throughout a fourteen-state territory in the Northeast.

Shirin Hojabri got her B.S. in Civil Engineering from University of Tehran, Iran. She is now studying her M.S. in Civil and Environmental Engineering at Northeastern University in Boston. Her research focuses on electrochemical remediation modeling for groundwater chlorinated contamination.

Gina Houck, M.S. is an environmental scientist with over nineteen years of professional experience and formal training in environmental analysis. Ms. Houck's proficiency is in automating and streamlining data analysis procedures for performing complex statistical analyses. Ms. Houck has been active in the development, design, and management of numerous applications, for integration with GIS or for deployment on the internet. She has developed applications in Visual Studio.Net, Visual Web Developer, Visual Basic for Applications for MS Access and Excel, ArcGIS (Python), and SQL Server. Ms. Houck also has extensive experience in pesticide fate and transport modelling, including dissipation kinetics, and vulnerability assessments. Clients have included government agencies, research centers, and private industry in both the U.S. and Europe.

Chi-Ying Hsieh is an environmental chemist with research interests in the fate, behavior, and toxicological effects of emerging environmental contaminants, including environmental disruptors and personal care products. She has worked in a number of areas, including environmental monitoring studies, ecological risk assessments, bioavailability of contaminants, toxicant identification evaluations, and the use of toxicity techniques to predict sediment toxicity. With broad training in environmental chemistry and ecotoxicology, Chi-Ying's experience includes a doctoral program at the Microbiology Laboratory at the Wall Experiment Station in Massachusetts, as well as postdoctoral investigations in the Department of Agricultural Chemistry at the National Taiwan University and more recently at the National Pingtung University of Science and Technology, where she is a full professor in the Department of Environmental Science and Engineering.

Marc Hudock has been working in GZA GeoEnvironmental, Inc.'s Northern New Jersey office since 2006 and is currently the Vice President. He holds a Licensed Site Remediation Professional (LSRP) license in New Jersey, and is responsible for a variety of industrial sector projects involving environmental investigation and remediation. Mr. Hudock has experience working with many contaminants in soil, groundwater, and sediment including: chlorinated hydrocarbons, BTEX, MTBE, PCBs, MGP-related wastes, chromate ore processing residue (COPR), and other heavy metals. Prior to working in the environmental industry, Mr. Hudock worked as a field geologist in the bituminous coal mining industry.

Timothy Iannuzzi is a Principal Scientist with more than twenty-six years of research and consulting experience, and a Senior Vice President and the Chief Ecologist for the Environmental Division of ARCADIS U.S., Inc. Tim's work and management experience includes human and ecological risk assessments, natural resource damage assessments (NRDAs) for oil and chemical releases, environmental impact evaluations, and ecological restoration. Throughout his career, Tim has been involved in research into key areas related to risk/impact assessment, environmental toxicology, NRDA, and historical ecology. He has published more than thirty-five technical papers in peer review journals

and two book chapters, and he was the senior author on a book entitled *A Common Tragedy, History of an Urban River* (Amherst Press, 2002), which chronicles the problems and challenges related to the restoration of urban watersheds. Tim is also teaches courses in Ecological Risk Assessment at the University of Maryland and for various professional societies.

J. Andrew Irwin, PE, LSP is President of IRWIN Engineers, Inc., a firm located in Natick, Massachusetts, specializing in chemical and environmental engineering. IRWIN Engineers was founded in 1996 and is a professional service firm providing effective response action support to owners of commercial real estate for assessment and cleanup of contaminated properties, and engineering for inherently safer processing and release prevention at industrial sites. Mr. Irwin received his B.S. and M.S. in Chemical Engineering from Cornell University and has over thirty years of professional engineering consulting experience. He is a practicing L.S.P. and a Past President of the LSP Association. As a longstanding member of the LSPA Technical Practices Committee, he has written many articles for the LSPA Newsletter and presented courses related to technical and regulatory facets of site assessment, remediation, and, in particular, management of remediation waste and hazardous waste.

Tanya Justham is an Aqueous Geochemist at GZA GeoEnvironmental, Inc. in Bedford, New Hampshire. She has a B.S. in Geology from St. Lawrence University and an M.S. in Geology from the University of North Dakota. Tanya has experience modeling natural and contaminated groundwater geochemical systems to evaluate contaminant pathways. Her consulting practice includes predictive evaluation of biofouling in geothermal systems, forensic analysis of contaminant release sources, mobilization and natural attenuation of manganese and arsenic, and site assessment and remediation of chlorinated solvents and manufactured gas plant wastes.

Cheryl A. Kehres-Dietrich, CGWP has over thirty years of environmental experience as a hydrogeologist, specializing in complex contaminated site assessment and remediation projects. As a Principal with SME, Ms. Kehres-Dietrich is SME's chief hydrogeologist and a Senior Consultant lead for the implementation of environmental remediation regulations. She is also responsible for SME's environmental technical training and quality assurance/quality control programs. Ms. Kehres-Dietrich serves as a Senior Client Contact and Senior Project Manager for SME clients, working on brownfield sites for communities and developers, and contaminated sites for corporate clients. She is a Certified Groundwater Professional through the National Groundwater Association. She holds a B.S. and M.S. in Geology with a specialization in Hydrogeology from Michigan State University.

Karen Kinsella, Ph.D. is a biogeochemist at GZA GeoEnvironmental, Inc. in Glastonbury, Connecticut. She has forty years' experience in the energy, construction, analytical, environmental, and radionuclide sectors. Karen earned a Ph.D. in Soil Chemistry and Microbiology from the University of Connecticut in 2009 and an M.S. in Chemistry from Central Connecticut State University in 1996. She has taught chemistry and environmental science at the secondary school level. Her consulting practice focuses on applying biochemical and geochemical processes for active remediation and enhanced natural attenuation of groundwater contaminants.

Allan Klindworth is a Climate Adaptation Project Manager with AECOM. He has recently transferred from AECOM's Melbourne, Australia office, to AECOM in New England. Mr. Klindworth has twelve years of experience in business management and sustainability consulting. He has worked with all levels of government and private sector organizations to help them better understand the risks presented by the changing climate and build their resilience through adaptation planning. He has led the delivery of more than twenty climate adaptation studies. Allan is currently leading the climate change impact assessment for North East Corridor Rail Expansion Project (NEC FUTURE).

Mark Kluger is a graduate of Johns Hopkins University with a focus in Chemistry, Physics and Material Sciences. Mark has experience with field analytical and data acquisition instrumentation; site characterization; surface geophysics; multi-phase fluid flow; process optimization; and sediment, soil, and groundwater remediation procedures and technologies. In February 2001, Mark founded Dajak®, LLC, a company that provides business development services to firms with innovative environmental characterization and remediation technologies. He also provides technical guidance to these companies

in the areas of marketing, industry trends, and remedial solutions. Mark is a member of the Interstate Technology and Regulatory Council and the Sustainable Remediation Forum.

Thomas Kryzak is the founder and lead inventor of Air & Earth LLC (A&E). A&E is a global research and development firm whose focus is on sediment and habitat remediation; invasive species eradication; nutrient/pesticide recovery; agriculture; energy; and historical artifact discovery, recovery, and documentation. A&E's mission is focused on the development, commercialization, marketing, and licensing of patented technologies that operate in a sustainable and social manner for the benefit of the environment and people globally. A&E is committed to international development and partnerships in an effort to promote and foster worldwide sustainability. Currently Thomas has over twenty issued patents in nine countries with at least twenty more patent applications under examination, and he continues to research and file patent applications in a multitude of fields. Thomas completed his first dredging project in Shandong Province, China in 2014 using one of his Chinese patented technologies. U.S. project work is routinely with the Department of Energy and the U.S. Navy and is focused in the contaminated sediment and invasive species areas. Thomas was selected in May 2015 to attend the Great Lakes and St. Lawrence Leadership Summit Meeting held in Quebec City, at which eight states and two provinces announced a series of actions to grow the region's $5 trillion economy and protect the world's greatest freshwater system. Specific actions included pledging to shrink the environmental impact of the region's transportation network and implement innovative responses to aquatic invasive species, nutrients, and harmful algae blooms.

John LaChance is the Thermal Remediation Practice Lead for ARCADIS U.S. and is located in their Chelmsford, Massachusetts office. Before joining ARCADIS, he worked with TerraTherm, Inc. for eleven years. In total, John offers over twenty-eight years of experience in characterizing and remediating contaminated sites with a focus on the design, implementation, and assessment of in situ thermal remediation (ISTR) systems, and the management of ISTR projects and research efforts at numerous sites both in the U.S. and overseas. John is a recognized expert in the thermal field and has worked with all three of the primary thermal remediation technologies: Thermal Conduction Heating (TCH), Steam Enhanced Extraction (SEE), and Electric Resistance Heating (ERH) or Electro-Thermal Dynamic Stripping Process (ET-DSP). His work has also included combining ISTR technologies (e.g., TCH and SEE) to better address challenging site hydrogeologic and contaminant conditions to ensure achievement of the desired remedial outcome. John has also evaluated and worked with newer thermal technologies such as STAR (Self-Sustaining Treatment for Active Remediation or smoldering combustion) and Gas Thermal Remediation (GTR). John works with clients, project teams, and other consultants to: 1) identify the best thermal technology or combination of technologies for a site and the remedial objectives; 2) develop RFPs and bid formats that allow apples-to-apples comparisons of thermal vendor proposals and selection of the best-value design and approach; 3) negotiate performance specifications and contract and payment terms that address client's goals, agency requirements, and provide an appropriate balance of risk and cost; 4) oversee and review ISTR designs and cost estimates; 5) oversee well field installation and construction of ISTR systems; 6) review and assist in evaluation of ISTR progress and troubleshooting of system challenges; and 7) report results and guide ISTR projects to shut-down and site closure. Additionally, he has authored many papers and presentations on ISTR and the hydrogeology of DNAPL sites, and he is a co-founder and presenter of the ISTR workshop that has been presented at the Conference on Soils, Sediments, and Water held annually at the University of Massachusetts Amherst for the past ten years.

Sarah LaRoe, Ph.D. is an Environmental Scientist at Anchor QEA, LLC in Saratoga Springs, New York. She specializes in chemical fate and transport in contaminated systems, remedial dredge design, and the evaluation of remedial outcomes. She has worked on multiple Superfund cleanup projects, including the Hudson River Dredging Project, the Grasse River Superfund site, and the Onondaga Lake Remediation. Dr. LaRoe received her Ph.D. from Rensselaer Polytechnic Institute in Environmental Engineering, focusing on microbial bioremediation of recalcitrant contaminants.

Laurent Levy is a senior project manager at Gradient, an environmental consulting firm located in Cambridge, Massachusetts, providing services to clients across the U.S. and internationally. Laurent has over ten years of experience working with industrial clients, attorneys, and regulators. His areas of

practice include subsurface environmental investigations, vapor intrusion assessment, chlorinated solvent characterization, site remediation, and environmental litigation support. He holds an undergraduate degree from the Ecole Centrale Paris, an engineering school located in France, as well as a Ph.D. in Civil and Environmental Engineering from the Massachusetts Institute of Technology. He is a registered Professional Engineer in Massachusetts.

Mark R. Lewis has been the Brownfields Coordinator for the Connecticut Department of Energy and Environmental Protection since April 2014. He works with municipalities, developers, property owners, the U.S. Environmental Protection Agency, other state agencies, and other partners to facilitate cleanup of brownfield sites throughout Connecticut and return those sites to productive use. Mark previously worked for twenty years in DEEP's Remediation Division as an Environmental Analyst overseeing the assessment and cleanup of sites ranging from small drycleaners to Superfund sites, including the Naval Submarine Base in Groton. He has worked as an environmental consultant focusing on assessment and remediation of contaminated properties, as a land surveyor, and as a hydrologic technician for the Water Resources Division of the U.S. Geological Survey. Mark is also a firefighter and squad boss on DEEP's Interstate Wildfire Crew, which responds to wildfires throughout the United States and in Canada. Mark is the Vice-President of the Brownfields Coalition of the Northeast. He is a founding member of the Geological Society of Connecticut and serves on its board of directors, and is an associate member of the Environmental Professionals Organization of Connecticut. Mark holds a B.S. in Geology from Bates College.

Patrick Lewis is President, Senior Scientist, and co-founder at Defiant Technologies, manufacturer of the FROG-4000. Pat has twenty-five years of experience in analytical chemistry and application development. He has worked for nineteen years in the field of chemical analysis microsystems and holds ten patents in the area. Pat has developed microsystems for volatile organic compounds, chemical warfare agents, toxic industrial chemicals, explosives, and other applications.

Eric Litman is an environmental scientist at the NewFields Environmental Forensics Practice in Rockland, Massachusetts. He has fourteen years of environmental chemistry experience specializing in analytical method development, forensic data quality assurance, and technical project management. This work is performed in support of forensic site investigations, liability management, and natural resource damage assessments.

Mark A. Maddaloni has been employed as an Environmental Protection Agency (EPA) Region 2 toxicologist since 1991 and currently holds the position of Regional Risk Coordinator. His responsibilities include coordinating cross-divisional risk assessment activities and providing consultation on toxicological matters of interest to EPA's Region 2 programs. Dr. Maddaloni sits on EPA national workgroups tasked with developing Agency guidance for asbestos, metals, dermal risk assessment, chemical mixtures, and bioavailability. Prior to his employment at the EPA, Dr. Maddaloni served as a clinical toxicologist at the New York City Poison Control Center, where his area of expertise was environmental/occupational exposures. He currently serves on the New York City Department of Health's Institutional Review Board (IRB) and the New Jersey Department of Environmental Protection's Science Advisory Board. Dr. Maddaloni is a Diplomate of the American Board of Toxicology and a member of the Society of Toxicology. He received his Dr.P.H. in Environmental Health Sciences from the Columbia University School of Public Health. His thesis was titled "Measurement of Soil-Borne Lead Bioavailability in Adults, and its Application in Biokinetic Modeling." Dr. Maddaloni received an M.S. in Toxicology from St. John's University and a B.S. in Pharmacy from Long Island University.

Renae Magaw is a Senior Staff Toxicologist with Chevron Energy Technology Company. She has over thirty years of experience in the fields of toxicology, human health risk assessment, environmental risk management, risk communication, and site remediation. During that time, she has worked in the environmental field in a number of academic research, consulting, and industrial capacities. In addition, she has developed and taught environmental risk assessment and risk management courses internally for Chevron and externally for the University of California at Berkeley, American Petroleum Institute, and other organizations. Ms. Magaw currently develops environmental management and remediation strategies for Chevron sites, conducts research to improve the science basis for risk-based decision

making, and provides technical support for domestic and international science advocacy and environmental management regulatory program development efforts.

Brian Magee has over thirty years' experience in toxicology and risk assessment. He is Principal Toxicologist at ARCADIS, where he is the Human Health and Ecological Risk Assessment Technical Leader. Dr. Magee directs risk assessment projects for a wide range of industrial and governmental clients and provides senior technical review of projects in which the critical evaluation of toxicological and pharmacokinetic data is essential. He has performed risk assessments of industrial and commercial buildings affected by chlorinated solvent releases, former manufactured gas plants, petroleum refineries, operating chemical plants, landfills, and petroleum spill sites. In addition, he has derived risk-based cleanup criteria for numerous CERCLA, RCRA, and state-listed sites. Dr. Magee has also performed risk assessments for combustion facilities, which include municipal solid waste combustors, hazardous waste combustors, petroleum- and petroleum coke-fired power plants, coal-fired power plants, cement kilns, and industrial boilers. Additionally, Dr. Magee has provided expert testimony regarding the risks posed by exposure to chlorinated solvents and petroleum mixtures, including creosote, diesel fuel, fuel oils, chlordane, lead, complexed cyanides, formaldehyde, and other chemicals.

Tyler Marcet is a Ph.D. candidate and graduate research assistant in the Department of Civil and Environmental Engineering at Tufts University. A member of the Environmental Sustainability Laboratory, his research is focused on the secondary impacts of in situ chlorinated solvent remediation technologies, with particular emphasis on thermal treatment and bioremediation.

Trey Martin is the Deputy Secretary of the Vermont Agency of Natural Resources. He was appointed to the position in January 2015 by Secretary Deborah Markowitz. Before his appointment, Martin served for two years as Senior Counsel and Government Affairs Director for the Agency's Department of Environmental Conservation. In that role he worked extensively on legislative and policy initiatives for the department and served as a departmental liaison to the Vermont Legislature, congressional delegation, and municipalities. Major initiatives that Martin worked on include the Shoreland Protection Act of 2014, the Lake Champlain TMDL, and Universal Recycling Law implementation. Prior to his work at the Agency of Natural Resources, Martin was an attorney with the law firm Downs Rachlin Martin, where he represented clients on land use and telecommunications matters, business transactions, and government affairs. He is a graduate of Vermont Law School where he was Editor in Chief of the *Vermont Law Review*. He received his undergraduate degree in American Civilization from Middlebury College. Martin also received advanced degrees in Educational Leadership and English Literature, and he formerly worked as a teacher and school administrator.

Kristina Masterson is in senior water resources, specializing in the application of numerical models to study vadose zone and groundwater flow and transport for remediation investigations and water resources management studies. During her twenty-five years as a Water Resources Engineer for CDM Smith, Ms. Masterson has managed and participated in a wide range of studies, including groundwater remediation investigation and feasibility study (RI/FS) projects, vadose zone transport analysis, water supply investigations, and water resources and watershed management studies.

Yoko Masue-Slowey, Ph.D. is a Senior Scientist at Exponent's Environmental Science practice, where she has been solving complex environmental problems across a range of industries, including oil and gas, mining, heavy industry, and government. An environmental geochemist by training, Dr. Masue-Slowey specializes in the fate and transport of contaminants in soil and aquatic systems. In addition to client service and project management, she has extensive research experience deciphering metal and organic carbon chemistry in diverse settings, from controlled laboratory systems to the rainforests of Hawaii. Dr. Masue-Slowey has also designed and taught courses in soil and environmental biogeochemical processes at Stanford University.

Raimundo Matos has fifteen years of experience as an environmental consultant conducting cost-effective regulatory closures at industrial/commercial properties across the New England area, New York, Puerto Rico, and Latin America. Raimundo also serves as the environmental regulatory and policy advisor for both U.S.-based and international corporations throughout Latin America, including advising

on jurisdiction-specific environmental policy issues and risks, and representing clients in negotiations and hearings before the local environmental authorities. Mr. Matos is also a recent Ph.D. graduate of the Law and Public Policy program at the Northeastern University College of Social Sciences and Humanities. His research interest focuses on the policy implications of privatizing or outsourcing traditional government decision-making functions to private professionals, with a focus on the privatization of the cleanup of properties contaminated with hazardous materials.

Mike Mazzarese has been involved with in-situ remediation for fifteen years, having worked within the remediation compound and environmental consulting community his entire professional career. His role as a Senior Engineer at AST involves project assessment and design, field implementation oversight, and post project data analysis. Mike is a graduate of Penn State University holding an M.S. in Environmental Engineering. He has previously worked for Vironex, Regenesis, and URS.

Ryan McCarthy is currently a project manager and environmental scientist at AECOM's Manchester, New Hampshire office. He has over thirteen years of professional experience conducting and managing environmental investigations. Mr. McCarthy primarily works on large-scale, multi-disciplinary, complex sediment projects located in freshwater, coastal, and offshore sites. He has worked with a broad spectrum of clients from both the public and private sector. Mr. McCarthy received his B.S. in Water Resources Management, his M.S. in Resource Administration and Management, and his M.B.A. all from the University of New Hampshire.

Bailey McNichol is a senior at the University of Connecticut and studies Natural Resources with an emphasis on Sustainable Forest Resources, and Spanish. She was accepted to participate in a National Science Foundation Research Experience for Undergraduates (REU) for the summer of 2015 and had the opportunity to work on her research under the mentorship of Dr. Garey Fox, a hydrologist at Oklahoma State University. The REU's focus was on stream restoration and rehabilitation. Bailey's project specifically used the Jet Erosion Test (JET) to compare variation in soil erodibility parameters on vegetated and non-vegetated soils. Bailey is in the process of applying for Master's programs focused on forest and soil ecology, but before beginning, intends to do a half-year of volunteer agricultural work in Chile. In her free time, Bailey is a rugby player and enjoys hiking, working out, reading, cooking, and spending time with friends and family.

Michael E. Miller, Ph.D. is an environmental chemist who specializes in bioremediation, remedial technology selection, sustainable remediation, chemical fate and transport, vapor intrusion, and environmental statistics. He has been with CDM Smith in Boston, Massachusetts since 1990, where he is a Principal Environmental Chemist. He is an active member of the Sustainable Remediation Forum (SURF) and the AEHS East Coast Conference Scientific Advisory Board. Dr. Miller holds a B.A. in Chemistry from Swarthmore College in Pennsylvania (1981), and M.S. (1983) and Ph.D. (1986) in Physical Chemistry from Cornell University in New York. He was a Postdoctoral Fellow in the Laboratory of Professor Martin Alexander in Soil Microbial Biodegradation at Cornell University from 1987-1990.

Steven Miller oversees the MassDOT (Department of Transportation) Highway Division's Environmental Management System and Sustainability efforts. He is also the Project Manager for two climate change related projects: the MassDOT-FHWA pilot project to assess the climate change and extreme weather vulnerabilities and adaption options of the Central Artery Tunnel System, and assessing the vulnerability of the Massachusetts coastal transportation system against climate change and extreme weather. He also consults with MassDOT colleagues and federal, state, and local agencies on climate change related projects. He has worked closely with the U.S. DOT, the Volpe National Transportation Center, Federal Highway Administration, American Association of State Highway Transportation Official, the Transportation Research Board, the Center for Clean Air Policy, and the Environmental and Energy Study Institute. He was the leading person to help develop the roadway sector adaptation strategies used in the Massachusetts Climate Change Adaptation Report dated September 2011. Steven is a member of the MassDOT Working Group, evaluating statewide climate change vulnerabilities on the transportation network, and is member of the Commonwealth's Climate Preparedness Initiative. He is a member of the Infrastructure and Climate Network (ICNet) linking academics, students, and DOT practitioners (visit

theICNet.org.) Steven is the co-author of the paper in preparation, "Incorporating Climate Change Information into Transportation Research and Design."

Rachel E. Mohler joined the Chevron Energy Technology Company in 2007 after receiving her Ph.D. in Analytical Chemistry from the University of Washington. She is currently a Senior Chemist in the Petroleum Materials Characterization Unit. Since joining Chevron she has worked on a variety of strategic research and technology development projects around taking the lab to the field, such as the evaluation of portable instruments and the development of groundwater sensors for monitoring benzene, and detailed characterization of jet fuel, diesel fuel, and crude oil. She has more than twenty publications and serves as a reviewer for one journal. The skills in chemistry and chemometric analysis have been repeatedly applied to Chevron's Environmental Forensics data. She also provides analytical consultation within Chevron for the Environmental Management Company and is an Assistant Adjunct Professor at Marquette University.

Will Moody has over fifteen years of environmental consulting, project management, and site remediation experience. For the last ten years, he has been working with Geo-Cleanse's innovative remedial design, implementation, and marketing departments. Mr. Moody has designed and managed a wide range of in-situ chemical remediation projects, which have addressed a variety of contaminants, including chlorinated solvents, petroleum hydrocarbons, MGP constituents, NAPLs, and emerging contaminants (e.g., 1,4-dioxane and Freon). He has supervised two of the largest in-situ chemical oxidation projects in the U.S. and has been involved with several projects in Europe. His role at Geo-Cleanse also includes field operations, site analysis, and laboratory studies. Mr. Moody has a B.S. in Environmental Science from Virginia Polytechnic Institute and State University.

Ellen Moyer is an independent environmental consultant, author, and speaker. She holds a B.A. in Anthropology, M.S. in Environmental Engineering, and Ph.D. in Civil Engineering. She is a registered professional engineer as well as a U.S. Green Building Council Leadership in Energy and Environmental Design Accredited Professional who works on some of the most challenging contaminated sites in the United States. Her technical expertise focuses on assessment and remediation of soil and groundwater contamination, engineering economics, sustainability, and natural resource protection. She has authored more than twenty-five articles and two books and presented more than 100 seminars on assessing and remediating contaminated soil and groundwater. The books are *MTBE Remediation Handbook* and *Economics of Leak Detection - A Case Study Approach*. She is a Huffington Post blogger writing articles on sustainability-related topics.

John R. Mullin is a Professor of Urban Planning in the Department of Landscape Architecture and Regional Planning and Associate Director of the Center for Economic Development at the University of Massachusetts Amherst (UMass). Between September 2001 and August 2012 he served as Vice Chancellor/Vice Provost for Outreach and Dean of the Graduate School. His research interests focus upon industrial revitalization, port development, and downtown revitalization. Dr. Mullin has written or edited over 100 book chapters, book reviews, technical reports, journal articles, and conference proceedings. He is a Fulbright Scholar, charter member of the Fellows of the American Institute of Certified Planners, and the recipient of the Chancellor's Medal, the highest honor bestowed to faculty at UMass Amherst. He is a retired, federally recognized Brigadier General from the Army National Guard.

Rangaramanujam Muthu is a co-author and co-developer of the American Petroleum Institute software and guidance for the calculation of LNAPL transmissivity from LNAPL bail-down tests for unconfined, confined, or perched LNAPL. In addition, Dr. Muthu has assisted with the development of ASTM International guidance on estimation of LNAPL transmissivity and LNAPL conceptual site model development. His experience includes sites impacted with petroleum hydrocarbons and chlorinated solvents. He has conducted NAPL nature and extent studies, NAPL mobility and recoverability field investigations and modeling, risk assessment and vapor intrusion analyses, statistical analysis and interpretation of a wide range of environmental data, guidance document development and training for software, and report preparation consistent with state and federal environmental regulations. Dr. Muthu holds a B.S. in Civil Engineering and Ph.D. in Environmental Engineering. He is an active member of

ASTM International, the American Society of Civil Engineers, the Texas Association of Environmental Professionals, and the Society of Petroleum Engineers.

Matthew W. Muzzy, PE is a Principal and Senior Geo-Environmental Engineer at Sevee & Maher Engineers, Inc. in Cumberland, Maine. Matt received a B.S. in Civil Engineering from the University of Maine and an M.S. in Civil Engineering from Colorado State University. His professional career has included multiple outside-the-box private sector projects involving cleanup of non-traditional wastes such as off-spec polymer, recausticizing wastes, paper mill sludge, and chlorinated solvents. Matt also has worked in the public sector and has several years of embankment dam engineering experience with the U.S. Bureau of Reclamation.

Jonathan Myers has a Ph.D. in Geochemistry plus thirty-three years of environmental consulting experience. His specialties include environmental forensics; geochemical modeling; natural attenuation investigations; radiochemistry; and the use of geochemical evaluations to distinguish between contamination versus naturally high background concentrations of elements in groundwater, surface water, sediment, and soil. Dr. Myers has authored over thirty peer-reviewed research papers and book chapters, and has taught short courses on geochemical and environmental forensic techniques.

Steffen Griepke Nielsen is involved in the front end designs at TerraTherm, Inc. He is responsible for the subsurface designs, including the numerical steam and TCH modeling conducted in the early design phase of their projects. In addition, he leads up TerraTherm´s data management efforts, and develops tools and systems allowing real time client access for operational data during operation of their thermal projects. Steffen has been a member of TerraTherm's team since 2008.

William Nineve is a member and founder of Trident Environmental Group, LLC, established in 1994. He studied Applied and Military Sciences at the U.S. Coast Guard Academy and received his B.S. in Environmental Science/Biology from Long Island University at Southampton. He has been providing environmental remediation, emergency response, hazardous waste transportation, and construction services since 1994. He has been providing the installation of CETCO Liquid Boot vapor barriers since 2007.

Jeff Norcross is an Environmental Protection Specialist at the U.S. Environmental Protection Agency's (EPA) Region 1 office in Boston, Massachusetts. Jeff works in the Region's Office of Civil Rights and Urban Affairs and his efforts are focused on ensuring that environmental justice is integrated into all of the Region's programs, policies, and activities to help achieve environmental and public health improvements for populations that may be disproportionately burdened by environmental harms and risks. Jeff has worked at EPA for over fifteen years as a paralegal, compliance inspector, and Equal Employment Opportunity Specialist.

Kirk O'Reilly, Ph.D., J.D. is a Senior Managing Scientist with Exponent, Inc.'s environmental science practice in Bellevue, Washington. Dr. O'Reilly has more than twenty-five years of experience investigating the interaction between environmental and biological chemistry. He has managed projects related to the remediation of soils, sediments, and groundwater; and provided litigation support in toxic tort, property damage, and Superfund cost allocation suits. Specific contaminants studied include crude oil, refined products, chlorinated solvents, wood treatment compounds, pesticides, and fertilizers. Dr. O'Reilly developed innovative methods for monitoring the transformation and assessing the risk of petroleum. He has participated in collaborative research projects with regulators at the federal, state, and local levels, and has taught technical courses sponsored by regulatory agencies, universities, and industrial trade groups. Dr. O'Reilly is a member of the Washington State Bar and has chaired the American Bar Association's Superfund and Natural Resource Damages Litigation Committee.

James Occhialini is a vice president of technical sales with Alpha Analytical and serves as the product line manager for the laboratory's ecological/human health risk assessment and dredging project applications. Jim has over thirty-five years of environmental analytical and consulting experience working on a wide range of project applications. He is very active with a number of regulatory workgroups and industry associations. Prior to joining Alpha, Jim was a principal scientist and laboratory manager for a

large environmental engineering firm where he had twenty years of service. He obtained a B.S. in Environmental Science from the University of Massachusetts Amherst.

James Okun is a Principal at the environmental consulting firm of O'Reilly, Talbot & Okun Associates, Inc. Jim has a B.S. in Chemistry and M.S. in Toxicology from Massachusetts Institute of Technology (MIT) and has conducted post-graduate research on the environmental fate of PCBs and pesticides at the University of Hawaii. While at USEPA Region 1, he was the PCB coordinator and the agency's first project manager on the New Bedford Harbor PCB Superfund Site. He serves as the Chairman of the Connecticut River Watershed Council, and he is a past elected member of the Ellington, Connecticut Board of Education and a past legislatively appointed member of the Connecticut Low-Level Radioactive Waste Advisory Committee.

José Manuel Palma-Oliveira was born (and still lives) in Setúbal Portugal, and is a Professor of Environmental Psychology and Risk Perception and Management at the University of Lisbon. His research has been extended to many areas, having the interaction between human and environment as a background. In this context he developed a model of environmental stress and works actively in the consequences of noise and environmental stimuli. He has worked with communities on this subject for two decades and has a 100% success record in solving the so-called (erroneously) NIMBY (Not In My Back Yard) problems. He specializes in analysis, perception, and risk management (mainly environmental). He is a consultant/risk manager and board member of Ambimed Stericycle Portugal (hazardous hospital waste), in Secil, Portugal, and Tunisia (co-incineration of alternative fuels and dangerous RIB and coordination of the science policy), and is the Chairman of "Parks of Industrial Ecology" (waste treatment compounds). Mr. Palma-Oliveira has been the Chairman of Quercus, one of the most active environmental NGOs in Southern Europe, and he was a member of the National Water Council. He was president of the Board of the Foundation for the Protection of the Salinas Samouco between 2001 and 2008. He had a very intense intervention on environmental and risk policy in Portugal and in the E.U. He was board member of the European Federation of Transport and Environment (Brussels) from 1997 to 2010. He is also a past President of the Society for Risk Analysis in Europe and a fellow of the SRA International. Mr. Palma-Oliveira was an invited expert in the preparation of E.U. directives, such as air quality and noise, and of the E.U. Socio Economical Committee (ECOSOC). He helped to install the structure of the hospital waste treatment compounds in Portugal and the co-processing of Refused Derived Fuels (including from hazardous waste) in the cement production. He also developed and installed Ecological Industrial Parks for integrative recycling and processing of industrial waste, and developed a new way of treating urban waste with the higher percentage of recovering in the literature.

Aaron D. Peacock is an environmental scientist with Pace Analytical that specializes in Environmental Molecular Diagnostics (EMDs) and their application to forensics, bioremediation, and natural attenuation of contaminants. Similar to how new personalized medicine techniques are being applied to managing health, Dr. Peacock leverages genetic and isotopic tests to help understand and remediate contaminated sites. Working with commercial clients and government entities, Dr. Peacock develops, evaluates, and implements new technologies for environmental surveillance; monitored natural attenuation; and remediation of soils, sediments, ground water, and surface water.

Bill Perkins, CHMM has over twenty-five years' experience working in the environmental disposal and analytical fields. He has a varied background working in labs; transportation; industrial remediation; and hazardous and now non-hazardous waste (EfW) disposal, ranging from landfill to incineration to treatment. He has closed sales from cleanup projects to lab packs throughout his career. Bill has worked with small and large companies in the Northeast throughout his career, serving the private and public, as well as environmental consultants and professionals. Bill is married with three children and resides in upstate New York. He is passionate about his family as well as skiing, sailing, and golf. He is active in the church; the American Cancer Society; professional organizations like Air & Waste Management Association (AWMA), where he is currently serving as the Vice Chairman of the Central New York Chapter; Alliance of Hazardous Materials Professionals (AHMP), the national association of CHMM's; the National Ski Patrol; and the Boy Scouts. Bill is an Eagle Scout and former Scoutmaster.

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R. Paul Philp is Professor of Petroleum and Environmental Geochemistry at the University of Oklahoma. He received his Ph.D. from the University of Sydney, Australia in 1972 and a D.Sc. from the same University in 1998 on the basis of his research in geochemistry over the past twenty years. Prior to starting at the University of Oklahoma in 1984, Dr. Philp was a Principal Research Scientist at C.S.I.R.O. in Sydney, Australia. His current research interests center around petroleum, reservoir, and production geochemistry with an emphasis on molecular and isotopic characterization of oils, gases, and rock extracts for the purposes of source determination, characterization of depositional environments, maturity, biodegradation, and for correlation purposes. Integration of geochemical techniques into reservoir characterization and facies characterization has become an increasingly important focus area of his research, along with applications to various aspects of basin modeling. He has authored or co-authored over 360 articles and books and has lectured extensively on petroleum and environmental geochemistry in Southeast Asia, South America, Europe, and Africa.

Jaana Pietari has an M.S. in Engineering from Tampere University of Technology, and she has also obtained an M.S. in Engineering and Ph.D. in Philosophy from the Department of Civil and Environmental Engineering at the University of Washington. She is currently Managing Scientist at Exponent, and focuses on environmental forensics for source apportionment and liability and cost allocation. More specifically, she applies chemical fingerprinting and historical chemical release reconstruction for a variety of industrial operations, including manufactured gas plants, refineries, and petroleum terminals.

Ashley Pirovano is a third year Ph.D. student at SUNY Environmental Science and Forestry studying under Dr. Lee Newman. Ashley earned her B.S. in Biology from Marymount Manhattan College. As an undergraduate researcher, she investigated the natural formation of organochlorine compounds in forest ecosystems with Dr. Alessandra Leri. For this research, she was awarded several presentation awards including first place in the Chemical Sciences for a poster presentation at the UMBC Undergraduate Research Symposium; first place in Ecology, Evolution, and Behavior category for poster presentation at William Patterson Symposium; and the Student-Faculty Collaboration Award at Marymount Manhattan College Honors Day. Her current research interests include phytotechnology, specifically the use of endophytic bacteria to enhance plant growth and the genetic mechanisms involved in the process.

Seth Pitkin, M.Sc. holds a B.S. in Geology from The Evergreen State College and a M.Sc. in Hydrogeology from the University of Waterloo. He has particular expertise in DNAPL site characterization in both porous media and fractured rock flow systems. With thirty years of experience, he is a leader in the area of High Resolution Site Characterization (HRSC) as well as Triad style investigations. He developed and delivers HRSC training both nationally and internationally. Pitkin is a participant in the University Consortium for Field Focused Groundwater Research and has commercialized technologies developed at the Universities of Waterloo and Guelph. He is the Vice President and Principal Hydrogeologist at Stone Environmental, Inc., where he is in charge of subsurface contamination projects and serves as Program Manager and technical expert on investigations in both porous and fractured media.

Toemthip Poolpak is a postdoctoral researcher in the Department of Biology, Faculty of Science at Mahidol University in Thailand. Additionally, she is currently a short-term research scholar in Plant Science and Biotechnology in the State University of New York College of Environmental Science and Forestry. She obtained her Ph.D. from Mahidol University in Thailand, where she studied accumulation and biodegradation of organochlorine pesticides in agricultural areas in central Thailand. She also has some research experiences in petroleum oil contaminated soil bioremediation using bioaugmentation as well as phytoremediation, with PTT Research and Technology Institute in Thailand.

Thomas Potter has over twenty-three years of experience working in the field of waste site cleanup and currently serves as the Statewide Clean Energy Development Coordinator for the Bureau of Waste Site Cleanup at the Massachusetts Department of Environmental Protection (MassDEP) in Boston. In conjunction with the Massachusetts Department of Energy Resources (DOER), Mr. Potter ensures project-specific support and coordination of parties seeking to develop renewable energy and energy efficiency projects in Massachusetts, provides for regulatory review and streamlining, develops policies and practices to review and assess clean energy opportunities, and provides broad public education and

engagement for clean energy development opportunities in Massachusetts. Prior to this role, Mr. Potter served on the MassDEP's Commissioner's Office Environmental Innovations Team to help advance some of the Commissioner's priorities in the areas of expanding innovation and energy-environmental coordination across MassDEP programs and regions using innovative and efficient approaches to the agencies' environmental protection programs. Prior to his help with this Team, Mr. Potter served for ten years as the Statewide Audit Coordinator for MassDEP's Bureau of Waste Site Cleanup Audit Program in Boston. As the Statewide Audit Coordinator, he was responsible for the implementation and operation of the legislatively mandated Audit Program, as well as the legislatively mandated audit of Activity and Use Limitations by the 1998 Brownfield's Legislation. Before joining the MassDEP, Mr. Potter worked throughout New England as an environmental consultant in the private sector for over five years, concentrating primarily on sites regulated under the Massachusetts waste site cleanup program. As an Adjunct Professor, he completed a semester of instruction on the Massachusetts waste site cleanup regulations at the University of Massachusetts in Boston. Currently a resident of the City of Boston, Mr. Potter holds a B.S. in Geography from Arizona State University in Tempe, Arizona.

Larry Rader is a professional geologist with over twenty years of experience in environmental assessment, remediation, and consulting. He specializes in feasibility evaluation, design, cost-estimating, implementation, and construction oversight of soil and groundwater remediation projects. He has expertise in soil and groundwater remediation utilizing innovative technologies, such as in-situ chemical oxidation, bio-enhancements, enhanced soil vapor extraction, and engineered excavations. Mr. Rader serves as MECX's Director of Remediation Services, operating out of the company's Chicago, Illinois office. In this role, he is responsible for coordination, logistics, and execution of remediation projects throughout North America.

Richard Rago serves as a Haley & Aldrich's Lead Scientist and is based out of their Rocky Hill, Connecticut office. Since joining Haley & Aldrich in 1991, Mr. Rago has long been recognized for contributions to regulatory agencies and professional organizations, including for his original support for Massachusetts Department of Environmental Protection's development and implementation of the VPH and EPH petroleum analytical methods, subsequent participation of the Data Quality Enhancement Program committee, and contributions to numerous other state and federal guidance documents. Mr. Rago has also directed independent research studies in support of improved environmental characterization, including indoor air sampling intervals, soil gas long term temporal stability, indoor air background, false positives in analytical quantitation of metals, and potential bias in petroleum hydrocarbons measurements including VPH methodologies.

Ljiljana Rajic is an Associate Research Scientist at Northeastern University in Boston, Massachusetts (2013-present). Before coming to Northeastern, Ljiljana received her Ph.D. in 2010 in Environmental Chemistry from the Faculty of Sciences in Novi Sad, Republic of Serbia, where she studied electrochemical processes to treat contaminated heterogeneous materials. As part of a Superfund Research Program, Puerto Rico Testsite for Exploring Contamination Treats (PROTECT), her research is focused on developing the enhanced electrochemical technologies to degrade contaminants in groundwater (e.g., trichloroethylene, nitrates). She is also involved in Research Translation Activities that include coordination and leadership across PROTECT to ensure that all research is widely translated to stakeholders.

Andrew Ramsburg is an Associate Professor in the Department of Civil and Environmental Engineering at Tufts University. His research broadly aims to provide scientific, technological, and educational contributions that bridge issues of environmental stewardship and water sustainability to inform decisions related to the restoration and preservation of environmental quality. His experimental investigations often focus on understanding the interplay between physical, chemical, and biological processes occurring within multiphase environments. Investigations are anchored by Dr. Ramsburg's expertise in solid-liquid and liquid-liquid equilibria, interphase mass transfer, multiphase flow, transport in porous media, biotic and abiotic reactions, and particle-particle (and droplet-droplet) interactions. Areas of application include source zone assessment and remediation, emulsion based delivery of amendments to the subsurface, and the fate and transport of neuroendocrine disrupting pharmaceuticals during biological treatment and water reuse.

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Richard Raymond is the President of Terra Systems, Inc., which is a bioremediation products and services company that is celebrating its twenty-three year anniversary. During the past thirty years, Dick has designed and managed numerous successful in-situ and ex-situ soil and groundwater remediation projects in the United States, Brazil, Japan, and Europe. He co-founded Biosystems, Inc., the first environmental bioremediation company in the United States, in 1984. The other co-founder is Dick Raymond, Sr., who authored the first in-situ bioremediation patent in the U.S. in 1971. Working together, Dick Raymond Jr. and Sr. proactively commercialized practical aerobic bioremediation technology solutions in the 1980's. Biosystems was later purchased by the DuPont Co. and renamed DuPont Environmental Remediation Services (DERS). During the past two decades, Dick Raymond Jr. has been an active participant in the development of advanced anaerobic bioremediation technology solutions. He is a co-founder of the Remediation Partners Consortium, a strategic alliance of complimentary remediation technology solution providers. He is also an affiliate member of the Alliance of Hazardous Materials Management Professionals (formerly the Academy of Certified Hazardous Materials Managers) and is a contributing member for the Sustainable Remediation Forum (SURF).

Assaf Rees is a senior environmental engineer and project manager specializing in the design, planning, and implementation of in situ remedial technologies. He is the leader of AECOM's Chemical Remediation Technical Practice Group.

Michelle Reid is the Executive Office of Energy and Environmental Affairs (EEA) Director of Environmental Justice. In this capacity, Ms. Reid is responsible for coordinating the Commonwealth of Massachusetts's environmental justice program, including but not limited to leading the implementation of the Commonwealth's Executive Order 552, as it applies to EEA and its departments. Additionally, she is responsible for providing environmental justice policy interpretation assistance to other Commonwealth Secretariats/departments. Since joining EEA, Ms. Reid has been involved in many policy and program-specific forums pertaining to prioritizing and implementing Executive Order 552. As Director she is responsible for leading Environmental Justice Policy revision efforts and working with interested stakeholders, both internally and externally, in order to pave the best path forward for environmental justice in Massachusetts. In addition to leading the effort to update Massachusetts' Environmental Justice Policy, she has been actively involved in supporting community stakeholder engagement and participating in discussions among key policymakers regarding environmental justice matters. As a passionate, public policy professional, Ms. Reid enjoys the opportunity to collaborate with agency stakeholders and environmental justice advocates in working towards effectively implementing and ensuring environmental justice throughout Massachusetts. Ms. Reid earned her Bachelor's degree in Environmental Science and Policy in 2013 and her M.P.A. in 2014, both from Clark University.

Fred Reitman is a Senior Toxicologist with Shell. Dr. Reitman brings over twenty-five years of toxicology and risk assessment experience with Shell and Texaco, preceded by two years as a toxicologist with Environmental Protection Agency's (EPA) Region 6 office focused on Superfund site risk assessments. His career in the petroleum industry has provided experience in hazard determination and communication for a broad series of petroleum process streams and products, as well as chemical and site risk assessment and regulatory compliance. He currently is Chairman of the ACC ethylene oxide and ethylene glycol Toxicology Research Task Groups, and co-chairs the Science Team of the Naphthalene Research Committee. Fred earned his B.S in Biology from the University of Illinois in 1978 and his Ph.D. in Toxicology from the Kettering Laboratory at the University of Cincinnati Department of Environmental Health in 1987. He became a board-certified toxicologist in 1991.

Gary M. Roberts holds a B.S. from the University of Massachusetts. He is a certified Massachusetts Third-Party Underground Storage Tank Inspector (UST), Certified UST Operator, American Petroleum Institute (API) Certified Aboveground Storage Tank Inspector (API 653), and holds certifications from the International Code Council for Above and Underground Storage Tank Installation and Retrofitting and Cathodic Protection. Mr. Roberts has been an active participant in the Massachusetts Department of Environmental Protection's (MassDEP) UST Stakeholder group and has been selected by the MassDEP to serve on a subcommittee to evaluate the new UST Operator examination and the development of the new data management system, which will be used to submit inspection and self-certification forms.

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Andrew Robinson is a Master's student in the Civil and Environmental Engineering Department at Tufts University, where he works as a researcher in the Integrated Multiphase Environmental Systems Laboratory. He earned a B.S. in Environmental Engineering from Roger Williams University in 2006. Andrew is interested in the remediation and vapor suppression capabilities of emulsifying agents on multi-component gasoline mixtures in the subsurface. In his free time, Andrew enjoys reading and hiking.

Jay Romano has a Biology and Chemistry degree from Roger Williams University. He has over eighteen years of experience in the environmental industry with twelve years' experience in environmental remediation. Mr. Romano has designed and managed over 300 projects in New York, New Jersey, Minnesota, Florida, Alaska, and the New England area. He has experience with the injection of sodium persulfate, permanganate, Oxygen BioChem (OBC®), Anaerobic BioChem, zero valent iron, EHC, steam, hydrogen peroxide, and calcium polysulfide.

Chapman Ross is a senior remediation engineer with Geosyntec and has over thirteen years of experience with the design and implementation of innovative soil and groundwater remediation programs, vapor intrusion (VI) assessment and mitigation projects, real-time environmental monitoring networks, and large-scale site investigations. Mr. Ross has been involved in the development of new technologies for vapor intrusion investigation, real-time in-situ VOC monitoring, slow-release remediation amendments, and remediation in low-permeability formations (DPT Jet Injection). He has led the design process for remediation projects utilizing in situ chemical oxidation (ISCO), enhanced in situ bioremediation, and physical removal technologies. While Mr. Ross has managed projects across the United States and internationally, he has also been working on Massachusetts Contingency Plan (MCP) sites for his entire career.

Gennaro Russo was born in Naples, Italy, where he received his basic education. He graduated cum laude in Chemical Engineering from the University of Naples in 1964. In 1975 he became full Professor of Industrial Chemistry at the University of Naples. He was Member of the Committee for Chemical Sciences of the National Research Council in Rome (1981−1993), Director of the Department of Chemical Engineering of the University of Napoli Federico II (1986−1992), and Director of the Institute of Research on Combustion of the National Research Council (1994 to 2008). The research interests of Gennaro Russo are represented by more than 250 publications in international refereed journals on: flammability and explosibility of gases, vapors, and combustible dusts; venting systems; runaway reactions; ignition and flame propagation; selective reduction of NO by NH3; methane catalytic combustion; catalytic decomposition of NO and N2O; partial oxidation of methane to synthesis gas; fluidized-bed combustion of coal; wood pyrolysis; and dehydrogenation of ethylbenzene to styrene and production of ethylene from ethane.

Tarek Saba is a Senior Managing Scientist at Exponent's Environmental Sciences Practice. He has fifteen years of experience providing consulting and expert support in matters involving geochemistry, chemical forensics, and hydrogeology. Dr. Saba's experience includes reconstructing the history of releases and tracking sources of various organic and inorganic chemical groups to determine contamination sources, extent of contamination, and liability.

Shawn Sager has over thirty years of experience preparing risk assessments. Dr. Sager has managed, performed, or reviewed risk assessments for more than 300 contaminated sites in over thirty states, of which more than seventy-five were Superfund sites. The scopes of the risk assessments have included evaluation of human health and environmental risks from past disposal or spills of gasoline, petroleum hydrocarbons, and inorganic and organic chemicals (e.g., metals, PAHs, pesticides, wood preservatives, solvents, PCBs, and dioxins) under a variety of regulatory programs. She has testified in court and regulatory hearings on risk-based closure and human health risk assessment.

Kristy Salafrio is an Engineering Geologist with the New York State Department of Environmental Conservation, within the Bureau of Spill Prevention and Response in the Division of Environmental Remediation, in Long Island. Kristy graduated from Penn State in 2000 with a B.S. in Geosciences and worked for a private environmental consultant before joining the DEC thirteen years ago. Kristy has

experience with groundwater remediation, including in-situ and ex-situ bio-remediation, at numerous petroleum release sites for New York State. She also supervises the remedial design for numerous projects where groundwater contamination poses an imminent threat to public drinking water supply wells or other sensitive receptors.

John Schaffer has over twenty-seven years of experience as an aquatic ecologist, ecological risk assessor, and sediment quality assessment specialist with Tetra Tech, Inc. He holds a B.S. and M.A. in Biology from the William Paterson University of New Jersey. He is a certified ecologist with the Ecological Society of America (ESA) and Certified Hazardous Materials Manager (CHMM). He has presented at many local, national, and international conferences on topics of aquatic ecology, risk assessment, exposure assessment, sediment quality, aquatic habitat restoration, and site specific remedial goal development. His professional experience includes assessment of contaminant bioaccumulation/ bioconcentration inclusive of PCBs, pesticides, dioxins, heavy metals, and PAHs within aquatic, marine, and terrestrial food chains; and sediment quality assessments within freshwater and marine ecosystems in the continental United States, Alaska, and the Virgin Islands. Riverine and estuary systems investigated include systems from the Atlantic Slope, Great Lakes, Mississippi, Ohio, Hudson, Passaic, Delaware, and Missouri River basins. Site specific experience includes food chain modeling, baseline ecological risk assessments, pre-remediation planning and restoration goal development, data quality objective identification, preliminary remedial goal development, and post remediation recovery monitoring programs for wetland, lacustrine, riverine, and estuarine ecosystems. He has remained very active in developing remedial goals for sediments through engagement of trust resource managers and regulating parties for private, state, and federally funded projects.

Richard Schaffner, Jr. is a Senior Consultant/Hydrogeologist with Pennoni Associates in their Methuen, Massachusetts office. With twenty-five years of experience, his practice includes hydrogeologic investigations and remediation of contaminated sites, with principal focus on applied environmental biotechnology. Mr. Schaffner has worked on intrinsic and enhanced bioremediation projects throughout the United States as well as the Caribbean, Canada, Japan, India, Saudi Arabia, Australia, North Africa, and Switzerland. With undergraduate and graduate degrees in Geology and Environmental Engineering, respectively, he is registered as a Professional Geologist in New Hampshire and is a Certified Ground Water Professional (CGWP) through the National Ground Water Association. He holds three patents on bioremediation additives, two in the U.S. and the other in Japan, and has one patent pending. He also moderated the Bioremediation Discussion Group (BioGroup, http://bioremediationgroup.org) on the Internet from 1996 to 2011, which had up to 8,000 members and facilitated technology transfer on biological remediation and natural attenuation topics.

Karen Scheuermann is an Environmental Engineer in the U.S. Environmental Protection Agency's (EPA) RCRA program in San Francisco, California. She has been working in the environmental field for twenty-five years. Most recently she has been active in developing EPA's Footprint Methodology and SEFA Worksheets, and conducting footprint analyses at cleanup sites. She has provided workshops and webinars on footprint analyses for EPA and State staff, as well as for general audiences. Karen has a B.S. in Chemical Engineering from the University of Arizona.

David Shea, PE has twenty-five years of experience as an environmental and site remediation engineer, the last twelve of which have included vapor intrusion assessment and mitigation for residential, commercial, and industrial buildings. He is a Principal Engineer with Sanborn, Head & Associates in Concord, New Hampshire, and is responsible for leading vapor intrusion and environmental remediation projects throughout the U.S. and abroad. He holds a B.S. in Civil Engineering from Princeton University and an M.S. in Civil Engineering from MIT. He is a licensed professional engineer in twelve states.

Patrick Sheehan has been with GZA GeoEnvironemental, Inc. for over twenty-three years and is a Senior Principal. He leads environmental site investigation, remediation, building services, and construction management efforts, including guaranteed fixed price remediation projects. Pat's area of specialization includes the design and construction management of complex integrated remediation projects. His particular areas of expertise include the design and optimization of remedial process systems, particularly those that rely on subsurface fluid flow. He has worked on various projects

throughout the United States, including multiple projects whose combined design and construction values exceeded $10 million. Recent efforts have included the NAPL recovery project he will discuss today, as well as one of the largest electrical resistance heating (ERH) projects in the United States. Pat earned his B.S. in Civil Engineering from the University of Notre Dame and his M.S. in Civil Engineering from Tufts University. He is a Professional Civil Engineer licensed in the Commonwealth of Massachusetts. He also currently manages GZA eastern Massachusetts operations. Pat also serves on the board of the Environmental Business Council of New England and participates in various other professional and trade groups, including the Boston Society of Civil Engineers and NAIOP (MA). He also serves on the Permanent Building Committee for the Town of Millis, Massachusetts.

Rui Shen is a Postdoc Researcher at Brown University. She is interested in Vapor intrusion, environmental fate and transport modeling, risk management, and data analysis.

Alex Sherrin started at the U.S. Environmental Protection Agency (EPA) in 1987 as an On-Scene Coordinator in the Superfund Removal group conducting emergency responses and time critical removal actions. In 1995, Alex moved to Sydney, Australia, where he worked with CH2M HILL as a consultant for four years. He spent two of these years working with the Olympic Coordinating Authority to clean up the site of the 2000 Sydney Olympic Games. In 1999 Alex returned to Boston and in 2001 obtained his Massachusetts Licensed Site Professional license. In 2004, Mr. Sherrin rejoined the U.S. EPA as an On-Scene Coordinator.

Jeeban Shrestha was born in 1976 in Banepa, Nepal. He started his research in organic waste to energy in 1993, when he was a student at Amrit Science Campus at Thamel, Kathmandu, Nepal. He developed new model biogas plant and tested successfully in 2005 with funding from UNDP (GEF-SGP) in Women Environment Preservation Committee, Lalitpur, Nepal. He has developed seven different models of biogas plant for this. He was awarded the “Jeet Bahadur Nakarmi Metal Technology Award” from Nepal Academy of Science and Technology in Khumaltar, Lalitpur in 2012. He has supervised the construction of forty-three large-sized biogas plants in different parts of Nepal and India. In 2013 he was team leader of the Household Model Biogas Plant Installation Project implemented by Nepal’s Alternative Energy Promotion Center within the Ministry of Science, Technology, and Environment. He has given presentations to the President of Nepal on the importance of biogas in Nepal. He was the winner of the Special Talent Promotion Grant from Nepal Academy of Science and Technology in 2014. Recently he has developed biogas purification systems and biogas distribution devices in Subis Poultry, Chitwan, Nepal.

Brant Smith is the Technical Applications Manager for ISCO Technologies at PeroxyChem. With over fourteen years of experience, Dr. Smith has designed and implemented over forty field applications and seventy bench scale tests. He specializes in technologies involving in situ chemical oxidation, in situ chemical reduction, in situ bioremediation, and metals stabilization. He has made over fifty presentations at national and international conferences, and his research works have been published in journals including *Environmental Science and Technology, Journal of Contaminant Hydrology, Environmental Toxicology and Chemistry,* and *Journal of Environmental Engineering*. Dr. Smith is a Co-Principal Investigator for a research grant (ER-2132) awarded through the Strategic Environmental Research and Development Program (SERDP) and is a chapter co-author for the book *In Situ Chemical Oxidation for Groundwater Remediation* (Siegrist, et al., 2011). Dr. Smith obtained a B.S. in Civil and Environmental Engineering and Economics from Worcester Polytechnic Institute, and an M.S. and Ph.D. in Civil Engineering from Washington State University. He is a registered Professional Engineer in Illinois and Washington State.

Dan Socci is CEO of EthicalChem, provider of innovative, patented, surfactant-enhanced chemistry and processes for soil and groundwater remediation. In this role Dan is responsible for all aspects of company operations, including solution and portfolio development as well as field operations. Prior to this position Dan was CEO of VeruTEK Technologies, Inc. EthicalChem acquired all VeruTEK intellectual property and patent rights in September 2014.

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Ravikumar Srirangam has over seven years of experience pertinent to design and implementation of Insitu remediation technologies involving Insitu chemical Oxidation (ISCO), Insitu Chemical Reduction (ISCR), and enhanced bioremediation. Ravi holds a Ph.D. in Environmental Engineering from the University of Illinois at Chicago (UIC) and has a B.S. in Chemical Engineering from BITS Pilani, India. As part of PeroxyChem, Ravi is the product technology leader for Klozur CR and PermeOx Ultra, and is also the territory manager responsible for developing business initiatives and providing onsite support to clients in the Upper North Eastern United States.

William Stiteler is a senior scientist with ARCADIS with over twenty years of experience in remote sensing, photogrammetry, and geospatial analysis. He has worked as an instructor in GIS and remote sensing at Cornell University and the College of Environmental Science and Forestry at New York State University. While at ARCADIS, Dr. Stiteler has worked on a variety of projects, including site revegetation, contamination estimation, remediation volume estimation, and ecological exposure assessment.

Nikole Stone is a Chemical Engineer with TerraTherm out of Gardner, Massachusetts. Nikole has been with TerraTherm since January of 2014 and graduated from Worcester Polytechnic Institute (WPI) in 2013 with a B.S. in Chemical Engineering. TerraTherm completes a variety of thermal remediation projects within the United States and internationally.

Eric Suuberg has been Associate Director of the Brown Superfund Research Program (SRP) since its inception, also serving as a Project Leader and Research Translation Core Director in that Center. A registered professional engineer, he is also a frequent consultant on problems related to environmental pollution and its causes. Prof. Suuberg is a Fellow of the American Chemical Society, in which he serves as a Trustee of the Energy and Fuels Division. He serves as a principal editor of the journal *Fuel*. His research focus has been in the areas of chemical thermodynamics, kinetics, and transport. Recently, this has involved experimental examination of thermodynamic properties of relevance to fate and transport processes for organic contaminant mixtures such as tars, oils, and halogenated hydrocarbons. He has also been actively involved in studying the processes that characterize the vapor intrusion process, and leads a group that has been developing mathematical tools for describing this problem.

James P. "Jay" Tarzia, M.S., CHP is one of three Principals of Radiation Safety & Control Services, Inc., a company whose mission is to provide radiation safety services to the nuclear, medical, industrial, and research communities. Over the past thirty years, Mr. Tarzia has held several technical and managerial positions at operating and decommissioning nuclear sites, and has successfully managed a variety of radiological projects for government, commercial, nuclear, and industrial users of radioactive materials. He received a B.S. in Radiological Health Physics and an M.S. in Radiological Sciences and Protection from the University of Massachusetts Lowell, and earned an M.B.A. from New Hampshire College. Jay also earned Comprehensive Certification from the American Board of Health Physics. He is the Chairman of the New Hampshire State Radiation Advisory Committee, the Chairman of the Nuclear Ship Savannah Association, and is on the American Board of Health Physics.

Christopher M. Teaf is a toxicologist, risk assessor, and public health specialist. Dr. Teaf has been Associate Director of the Center for Biomedical and Toxicological Research at Florida State University since 1979. He has over three decades of environmental and public health experience specializing in soil; water and air quality; risk assessment; and environmental health issues including metals, petroleum, pesticides, solvents, particulates, and bacteria/molds. He is board-certified by the Academy of Toxicological Sciences. His experience includes industrial facilities, agricultural sites, waste management facilities, educational institutions, and products in general commerce. Chris has directed research and taught many environmental toxicology and risk assessment courses for the private sector as well as for USEPA, the World Health Organization, NATO, U.S. Air Force, ATSDR, and numerous state/local agencies. He presently serves as Senior Human Health Editor for *Human and Ecological Risk Assessment*, an international journal; and has served on Technical Advisory Committees for many environmental symposia in the U.S., Europe, and Central Asia. He has provided toxicology and health testimony for federal and state agencies and state or federal courts for over twenty-five years.

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Karen Thorbjornsen holds a B.S. and M.S. in Geology and is a registered Professional Geologist with licenses in Alabama, Georgia, South Carolina, and Tennessee. She has nineteen years of environmental consulting experience with CB&I Federal Services (formerly Shaw Environmental) in Knoxville, Tennessee. She performs background studies for metals and PAHs in environmental media and statistical analyses of environmental data at numerous sites across the United States. She specializes in geochemical evaluations of metals — a forensic technique to distinguish natural concentrations from site-related contamination in soil, groundwater, sediment, and surface water. Ms. Thorbjornsen performs geochemical evaluations to delineate the extent of contamination, refine lists of chemicals of concern, optimize long-term monitoring programs, confirm the success of soil-removal actions, and characterize background distributions. She has authored several papers on geochemical evaluations of metals and teaches short courses on the technique. Her papers have been published in *Environmental Forensics Journal, Journal of Structural Geology, Remediation,* and *Soil and Sediment Contamination*.

Curt Varner, PE, CEM has more than twenty years of experience in environmental consulting, including site assessment, remedial system design, construction management, and performance optimization. Mr. Varner has extensive experience implementing in-situ bioremediation remedies under both aerobic and anaerobic degradation pathways. He provides engineering solutions that result in selection of technologies for mitigation of petroleum hydrocarbon and chlorinated solvent releases. In particular, Mr. Varner's interests include development of sustainable, cost-effective in-situ remedial solutions that lead to site closure with minimal resource depletion or generation of greenhouse gas emissions. He holds a B.S. in Mechanical Engineering and M.S. in Environmental Engineering, both from the State University of New York at Buffalo.

Jason Vogel is a Senior Ecologist with ARCADIS located in their Syracuse, New York office. He has over fifteen years of consulting experience in ecological investigation, risk assessment, and multiple exposure media data analysis for industrial sites under various federal and state-led regulatory programs; including RCRA, TSCA, and New York State Brownfield Cleanup Program. He also has experience throughout the United States in conducting aquatic and ecological studies to support EIS activities under NEPA, support activities for NRDA, and USACE joint permitting to support the Endangered Species Act through NOAA-NMFS consultations for the evaluation of essential fish habitat to support site cleanup activities and development.

Michael J. Wade is Principal Scientist of Wade Research, Inc.™, a small business that provides geochemical consulting services to a variety of government agencies, industrial clients, and law firms. Dr. Wade is an organic geochemist with over thirty-six years of post-doctoral experience with an overall total of forty-three years of strong technical and project management experience in a variety of research programs with special emphasis on study of organic contamination in the environment. He regularly provides expert forensic services both through deposition process as well as testimony in various U.S. Federal and State Courts in areas of environmental contamination, including assessment of sources of contamination, identification of petroleum product types, quantification of weathering effects on petroleum products, and age-dating of petroleum product releases. Since 1992, working through Wade Research, Inc., Dr. Wade has engaged in the conduct of numerous projects dealing with the various aspects of environmental assessment, including measuring degradation of petroleum hydrocarbons and development of quantitative hydrocarbon fingerprinting techniques that identify sources of subsurface petroleum contamination. Recently, Dr. Wade has devoted an increasing amount of time and effort to increasing the quantitative understanding of petroleum product weathering reactions in the environment. As part of his assignment mix, he has completed numerous assignments that have refined quantitative field and laboratory investigation approaches designed to establish time frames for the release of gasoline, kerosene, diesel fuel, and heavier fuel oils in subsurface petroleum contamination cases. Annually, through Wade Research, Inc., Dr. Wade conducts twenty to thirty such programs for clients throughout North America. In addition to his regular assignment mix, he teaches forensic geochemical continuing education courses for a variety of state and professional society venues throughout the United States. Such courses provide today's environmental professionals with a broad background in organic chemistry that is then focused down to specific tools that investigators can use to develop information on anthropogenic contaminants that lead to allocation discussions and/or legal responsibility resolution.

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William Walker has twenty-five years of professional experience in chemistry and aqueous geochemistry. He has completed numerous groundwater and surface water quality studies as part of remediation efforts and mine permitting and closure activities. He has worked on numerous projects related to acid-rock drainage issues, mine dewatering approaches, and water quality improvements to mine related effluents. Dr. Walker's recent work is focused on passive water treatment systems for removal of heavy metals, sulfate, and other chemicals in both industrial and mine impacted waters.

Harshi Weerasinghe is a Ph.D. candidate in Environmental Engineering in the Department of Civil and Environmental Engineering at Northeastern University in Boston. She has received her Ph.D. in Geosciences from the University of Hamburg, M.S. in Geospatial Technologies from the University of Münster, and B.S. in Agricultural Engineering from the University of Peradeniya. She has worked on engineering and water resources research projects with local and international organizations. Her current research focus is to understand the impact of precipitation patterns on surface water quality in highly contaminated karst regions, and adaptation measures. She is currently working for The Puerto Rico Test Site for Exploring Contamination Threats (PROTECT) Program at Northeastern University.

Konnie Wescott is an archaeologist and Department Lead at Argonne National Laboratory, a federally funded research and development center near Chicago, Illinois. At Argonne she has been conducting environmental assessments for energy-related projects for over twenty years. This work has included archaeological surveys, development of cultural resource management plans, GIS-based predictive modeling, historic building inventories, and HABS/HAER documentation; but primarily involves preparation of environmental impact statements and supporting National Energy Policy Act and Section 106 activities. She is currently working in support of the Bureau of Land Management in their Solar Energy Program. She is assisting in the development of several Solar Regional Mitigation Strategies for solar energy zones designated by the agency in Arizona, Colorado, and Nevada; a Long-Term Monitoring Pilot in California; and a pilot cultural landscape assessment in the San Luis Valley-Taos Plateau of southern Colorado and northern New Mexico.

James Wescott is an environmental engineer with Tetra Tech in Chicago, Illinois. Jim has been with Tetra Tech since 2009. Before that he worked for both environmental consulting and construction firms, primarily in the Chicago area. He has a B.S. in Civil Engineering from North Carolina State University and M.S. in Environmental Engineering from Vanderbilt University. In addition to sediment projects, Jim has extensive experience in brownfield redevelopment and radioactive waste management.

Rick Wice is a Project Manager and Senior Geologist for Tetra Tech in their Pittsburgh, Pennsylvania office. He has thirty years of experience in the environmental restoration area. Rick works on site investigations and remediation with an emphasis on chlorinated solvents, bedrock, DNAPL, and LNAPL sites. He is a member of the Board of Trustees for the Sustainable Remediation Forum (SURF) and teaches the Remediation Engineering course at Carnegie Mellon University, which includes an emphasis on sustainable remediation.

Bob Wilkenfeld is General Manager of the Marketing Business Unit for the Chevron Environmental Management Company (CEMC). His organization is responsible for remediating environmental impacts associated with the global marketing of motor and aviation fuels, lubricants, and asphalt products. He also serves as Chairman of Resource Environmental LLC, a joint venture formed by Chevron, ConocoPhillips, ExxonMobil, Marathon, and Shell to respond to releases of motor fuels in the U.S. that could threaten drinking water supplies or the public health. A native of Niagara Falls, New York, Wilkenfeld graduated from the University of Vermont in 1976 with a B.S. in Chemistry. He received an M.S. and Ph.D. in Toxicology from the University of Rochester in 1981. His technical expertise encompasses inhalation and male reproductive toxicology, human health risk assessment, and risk communication. He is a Diplomate of the American Board of Toxicology and a full member of the Society for Toxicology. Throughout his career, Bob has been active in promoting our understanding of the toxicity and environmental fate and transport of petroleum hydrocarbons. In the early 1990s, Wilkenfeld led numerous industry toxicology efforts, including the TAME Testing Group and the Fuel & Fuel Additives Research Group. He was a founding member of, and served on the Executive Committee for, the Total Petroleum Hydrocarbon Criteria Working Group. Since 2007 Bob has served as the management

sponsor for Chevron's extensive remediation R&D Program. This multidisciplinary program focuses on improving our understanding of contaminant fate and transport and identifying breakthrough methods to investigate and remediate hydrocarbon-, metal- and brine-impacted sites. Ongoing research involves collaboration with over twenty universities and research institutes in five countries. The scope of projects spans from the development of non-intrusive site characterization technologies to the commercialization of novel in-situ soil and sediment remediation technologies. To date, the program has produced over twenty journal articles, fifteen conference posters and presentations, and several patents.

John T. Wilson, Ph.D. has extensive experience in natural attenuation processes and bioremediation. He is currently the Principal Scientist with Scissortail Environmental Solutions, LLC. Dr. Wilson served as a research microbiologist for the U.S. Environmental Protection Agency (EPA) at the R.S. Kerr Environmental Research Center in Ada, Oklahoma for thirty-five years. He has a B.S. in Biology from Baylor University, an M.A. in Microbiology from the University of California at Berkeley, and a Ph.D. in Microbiology from Cornell University. Dr. Wilson's research for EPA was primarily on natural attenuation of BTEX compounds, fuel additives, and chlorinated solvents, as well as in-situ bioremediation of chlorinated solvents. He has over sixty publications on these topics. He was a co-author and edited the U.S. EPA Report titled *A Guide for Assessing Biodegradation and Source Identification of Organic Ground Water Contaminants Using Compound Specific Isotope Analysis (CSIA).* In addition to his research activities, he provided training and technical assistance to the EPA regions and to state agencies.

David Winslow is a Senior Vice President with GZA GeoEnvironmental, Inc. He provides environmental consulting services for contaminated real estate acquisitions and development projects, including environmental due diligence, contaminated soil and groundwater investigations, contaminated soils management/transportation and disposal, remedial design, and remediation. He has provided consulting services on brownfield projects in the metropolitan New York area, the Hudson Valley, Up-State New York, Connecticut, New Jersey, North Carolina, and Pennsylvania. Dr. Winslow is also Principal In-Charge for many public sector contracts, including the New York City School Construction Authority, Port Authority of New York and New Jersey, and the Dormitory Authority of New York. He graduated with a B.S. in Geological Sciences from Binghamton University in 1989. He has an M.S. in Geological Sciences from Virginia Tech and a Doctorate from Lehigh University. Dr. Winslow is a frequent public speaker and has presented papers at the Battelle Bioremediation Symposium, Battelle Chlorinated Solvent Conference, RemTech, the National Groundwater Association, the Geological Society of America, the American Society of Civil Engineers, and the New York State Economic Development Council.

Bernabas Wolde is a doctoral candidate in the Environmental Management Program at Montclair State University in New Jersey. His research assesses the socioeconomic and environmental implications of using woody biomass for energy production. Accordingly, it brings together different perspectives and tools including life cycle assessment, techno-economics, and survey based data analyses to better understand the multidimensional impacts of different energy sources. Given the tradeoff between economic gain from supplying a higher proportion of residual biomass for bioenergy and its adverse implications for water and soil quality, the presentation will focus on forestland owners' sustainability concerns, profiling forestland owners likely to over-harvest biomass, and their policy preferences.

Steven Woodard is the President and co-founder of Emerging Compounds Treatment Technologies (ECT). ECT is an equipment company focused on developing and commercializing treatment technologies for emerging difficult-to-treat compounds. Steve's responsibilities include leading research and new product development, providing technical leadership on all projects, proposal development, intellectual property, and communication with the engineering/remediation community. Steve is also the inventor of BioMag, a biological treatment process that was purchased by Evoqua Water Technologies. He has twenty-five years of experience in water and wastewater treatment, fifteen of which were in consulting. Steve's focus is currently on bringing Synthetic Media technology to the marketplace for the treatment of 1,4-dioxane, perfluorinated compounds, and other emerging compounds. He received his Ph.D. in Environmental Engineering from Purdue University in 1992.

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Julie Wormser is the Executive Director of The Boston Harbor Association (TBHA), a non-profit organization focused on economic development, public access, and sea level rise adaptation along Boston's waterfront. Prior to joining TBHA, she spent fifteen years as a senior regional strategist with Environmental Defense Fund, Appalachian Mountain, and The Wilderness Society. She helped secure millions of dollars in federal funding for forestlands and marine fisheries in New England. She coauthored *Preparing for the Rising Tide* (TBHA, February 2013) and *Designing with Water: Creative Solutions from Around the Globe* (TBHA and Sasaki Associates, August 2014) and co-led the Boston Living with Water international design competition with the City of Boston and Boston Society of Architects. She received her B.A. in Biology from Swarthmore College and her M.P.A. from Harvard's Kennedy School of Government.

Yijun Yao is an associate professor of Environmental Science in Zhejiang University in Hangzhou, China. His research concentrates on the numerical and analytical simulations of the transport of volatile chemicals in the subsurface. Before Joining Zhejiang University, he earned his Ph.D. in Engineering from Brown University in 2012.

Christopher Yates is an environmental scientist with over fifteen years of experience in the management and execution of environmental sampling programs conducted on surface water, groundwater, and sediment. Mr. Yates has extensive knowledge of real-time water quality monitoring applications specifically suited for complex sampling programs. He has extensive experience in graphical and statistical analyses of large data sets using programming languages, GPS, and Geographical Information System applications.

William E. Young, RLA, PWS is a Professional Wetland Scientist at USA Environment, LP. He is a recognized leader in the environmental field with more than thirty years of experience as a project manager, designer, and wetland specialist. He holds a B.S. from the State University of New York (SUNY) College of Environmental Science and Forestry and an M.S. from Pratt Institute in New York. He has experience in construction, design, and planning on large-scale restoration and wetland sites. His expertise includes habitat restoration on disturbed lands, wetlands monitoring and construction, natural resource inventory, forestry, wildlife assessment, mitigation and banking, and erosion and sediment control. Mr. Young is an adjunct professor at Temple University and the School of Design at the University of Pennsylvania, teaching Sustainable Practices and Ecology.

Bilgen Yuncu, Ph.D., PE, CAPM obtained her Ph.D. in Civil, Construction, and Environmental Engineering from North Carolina State University and worked as a Post-Doctoral Research Scholar in the same department. Her Ph.D. work has been mainly focused on taste and odor removal from drinking water by adsorption and ozone oxidation. As a post-doctoral scholar, she conducted research on biodegradation - sorption barriers for munitions constituents. Since February 2012, she has been working for Solutions-IES as Project Manager and Environmental Engineer, where she serves as lead engineer on many of the firms in situ bioremediation projects. She holds a North Carolina Professional Engineer license.

Christian Zeigler graduated from James Madison University in 2005 with a B.S. in Chemistry, and from Tufts University in 2012 with a Ph.D. under Professor Albert Robbat, Jr. His research has focused on the analysis and remediation of coal-tar contaminated sites.

Stephen Zemba is a Mechanical Engineer at CDM Smith with more than twenty-five years of experience in the field of environmental risk assessment. Dr. Zemba received a B.S. from Carnegie-Mellon University (1983) and an M.S. (1985) and Ph.D. (1989) from the Massachusetts Institute of Technology (MIT), all in Mechanical Engineering. Dr. Zemba also teaches courses in air pollution at Tufts University and the University of Massachusetts Lowell.

Dawn A. Zemo received her B.A. in Geology from Stephens College in 1980 and her M.S. in Geology from Vanderbilt University in 1982. She is a Professional Geologist and a Certified Engineering Geologist in California. Ms. Zemo is Principal Hydrogeologist of Zemo & Associates, which she formed in 2002. Her professional experience includes petroleum hydrocarbon exploration and development geology,

petrophysics, hydrogeology, environmental site characterization and remediation, environmental forensics, and expert witness and confidential litigation consulting. Ms. Zemo has practiced in the environmental field since 1988. She serves on the editorial review boards/peer review teams for the international journals *Ground Water Monitoring* and *Remediation* and *Environmental Forensics.* She was on the technical expert team for the revised California Leaking Underground Fuel Tank (LUFT) Manual guidance document, which was written on behalf of the California State Water Resources Control Board. Ms. Zemo is a nationally recognized expert and published author in the areas of petroleum fate and analysis (especially issues with "TPH"), site characterization, groundwater monitoring, and the use of environmental forensic chemistry for regulatory or litigation applications.

Julio Zimbron is the founder of E-Flux and the co-inventor of the E-Flux CO2 Traps. He holds a B.S. in Biochemical Engineering from the Monterrey Technical Institute in Queretaro, Mexico, and M.S. and Ph.D. in Chemical Engineering from Colorado State University. Dr. Zimbron's professional experience spans twelve years and includes two years of environmental consulting, five years of industrial research at General Electric's Environmental Technologies Lab, and seven years of academic research at Colorado State University's Department of Civil and Environmental Engineering.