

Wastewater Treatment and Waste Disposal Roundtable Participants and Observers

Participants

Lawrence Cenegy, Senior Corrosion Engineering Advisor, Hess Corporation

Lawrence Cenegy is a Senior Corrosion Engineering Advisor, providing corrosion and water management support to Hess business units worldwide. He is currently involved in several unconventional resource water management projects involving water sourcing, application, and reuse, and he is a member of the Hess-internal Water Advisory Technical Resource team. Prior to joining Hess, he held the position of CAPEX Projects Manager for Nalco Company, focusing on chemical treatment programs for both land-based and deepwater projects. Before that position, he was a Research Section Leader for Nalco Company and earlier for Exxon Chemical Company, managing group projects in the areas of water treatment and flow assurance. His 35-plus years of industry experience include projects in all the major oil production regions worldwide. He has co-authored over 15 technical papers and patents and he is a member of the Society of Petroleum Engineers, National Association of Corrosion Engineers, and American Chemical Society. He holds a BA in Chemistry from the College of New Jersey and a MBA from the University of St. Thomas in Houston.

Jay Ewing, Manager, Devon Energy Corporation

Jay Ewing is the Manager of Completion and Construction of Devon Energy's Fort Worth Basin operating area, which includes the Barnett Shale in North Texas. In this role, he is responsible for managing well completion operations, including hydraulic fracturing. In addition, he manages the testing and servicing and intervention operations at the rig site. He is also in charge of overseeing Devon's water recycling program in the Barnett Shale. He brings more than 25 years of experience to the oil and gas industry. He is a Member of the Society of Petroleum Engineers and is a Past President of the Fort Worth Chapter. He is also a Member of the American Association of Drilling Engineers and Past Chairman of the Barnett Shale Water Conservation and Management Committee. He is a Registered Professional Engineer in the State of Texas. He attended the University of Texas at Austin where he earned a BS in Petroleum Engineering.

Christopher B. Hill, Environmental Engineer, Chesapeake Energy Corporation

Christopher Hill is an Environmental Engineer in the Environmental Health and Safety Regulatory and Scientific Affairs Department at Chesapeake Energy Corporation. At Chesapeake he has served as a technical lead on a number of scientific research initiatives related to hydraulic fracturing and other oil and gas activities, applying sound scientific and quality principles. He has actively participated in multiple aspects of US EPA's broader hydraulic fracturing research initiatives include the prospective and retrospective cases studies. Prior to joining Chesapeake, he worked for a major oil and gas company, as a Facility Engineer, supporting process safety initiatives for natural gas and natural gas liquid pipelines and

facilities. He has a BS in Civil Engineering, a MS in Environmental Engineering and is currently pursuing a MS in Construction Management from North Dakota State University.

George King, Distinguished Engineering Advisor, Apache Corporation

George King is an Apache Corporation Distinguished Engineering Fellow and a Registered Professional Engineer (Oklahoma PE 10831 and Texas PE 110993) with over 40 years of oilfield experience since starting with Amoco Production Research in 1971. His technical background includes basic research on energized fracturing, production and fracturing chemicals, acidizing, asphaltenes, perforating cleanup, well integrity and completions, complex formations (North Sea chalk, San Juan coal, Alaskan and Canadian heavy/viscous oil, US tight gas, GoM Deep Water, and Niobrara shale), unconventional resources in the Barnett Shale, Horn River Shale, Eagle Ford Shale, Fayetteville Shale, and Gothic Shale), sand control, low pressure gas well operations and applications work on coiled tubing, cutoff, formation damage and well repair operations. His technical accomplishments include 60 technical papers, a book on completions and workovers, Distinguished Lecturer on foam fracturing for the Society of Petroleum Engineers (SPE) during 1985-1986, and a Completions Course Lecturer on horizontal wells for the SPE Short Course series in 1999. Industry positions held include Technical Chairman of the 1992 SPE Annual Fall Meeting, past American Petroleum Institute subcommittee chair on perforating, 11 years adjunct professor at the University of Tulsa (teaching senior level and graduate credit well completions and fracturing courses at night), and numerous SPE committees on forums, paper selection committees and Applied Technology workshops. Awards include the Amoco Vice President's Award for Technology from Amoco in 1997, API's service award in 1994, and the 2004 SPE Production Operations Award. He holds a BS in Chemistry from Oklahoma State, a BS in Chemical Engineering from University of Tulsa and a MS in Petroleum Engineering from University of Tulsa.

Hugh MacMillan, Senior Researcher, Food and Water Watch

Hugh MacMillan is a Senior Researcher at Food and Water Watch, which he joined in 2011 after one year as a Science Advisor in the U.S. Senate and ten years in academia. He is an applied mathematician with extensive experience working on diverse computational problems, including the development of numerical models to quantify multiphase fluid flow through porous and fractured media, geochemical and microbiological processes, and crack propagation. Further, he is an expert in mathematical and statistical methods used to estimate uncertainties inherent to such modeling.

Woldezion Mesghinna, Founder, Natural Resources Consulting Engineers, Inc.

Woldezion Mesghinna founded Natural Resources Consulting Engineers, Inc. (NRCE) in 1989 after 17 years of domestic and international experience in water resources. Since this time, he has worked as President and Principal Engineer at NRCE on a variety of projects for Indian Tribes and the Government of Eritrea related to groundwater wells, energy development, water acquisitions and detailed hydrologic and water quality modeling. He is an expert and has significant experience in surface water and groundwater hydrology, water quality and constituent mixing, water demands and planning, water infrastructure project design and water

marketing and acquisition. Relevant projects have included analysis of mixing of groundwater and water quality constituents as part of a well testing program of groundwater quality and flow characteristics; subsurface investigations, soil sampling, rock coring, and permeability testing; design of a dewatering system through groundwater hydrologic analysis for a sub-aqueous tunnel; investigation of groundwater resources for development potentials; design of and utilization of embankment grouting injection wells for several dam projects in the United States and Eritrea to prevent subsurface seepage flows; and water treatment and wastewater treatment feasibility design studies in Eritrea and the western United States. Recently, he presented *Water Based Constraints on Tribal Energy Development in the Southwest* at a Tribal Energy conference hosted by Law Seminars International. He is a Licensed Professional Engineer in Arizona, California, Colorado, Wyoming and a member of the National Society of Professional Engineers, American Society of Civil Engineers, American Society of Testing and Materials, American Water Works Association and the Colorado River Water Users Association. He has a MS in Civil Engineering, with a concentration in Hydraulics and Hydrology and a PhD in Irrigation and Drainage Engineering.

Glenn Miller, Professor of Environmental and Resource Science, University of Nevada, Reno

Glenn Miller is a Professor of Environmental and Resource Sciences at the University of Nevada, Reno (UNR). He is also presently Director of the Graduate Program in Environmental Sciences and Health at UNR. Current areas of research include precious metals pit water quality and acid mine remediation using anaerobic sulfate reducing systems. He also is working on a variety of issues related to the measurement and fate of organic contaminants in the environment. He was also involved in a project providing comments on the New York Environmental Impact Statement on hydraulic fracturing. He has a BS in Chemistry from the University of California, Santa Barbara and a PhD in Agricultural and Environmental Chemistry from the University of California at Davis. After completing his graduate studies, he spent a year of postdoctoral study at US EPA's Environmental Research Laboratory in Athens, Georgia.

Peter Miller, Range Resources

Peter Miller has 20 years of professional experience in water management, industrial wastewater treatment, environmental remediation, and environmental consulting. His professional experience spans across a broad range of industries, including oil and gas, microelectronics, landfills, alternative energy, and food and beverage among others. Prior to starting with Range Resources in February of 2010, he worked for such companies as USFilter, Veolia, Siemens Water Technologies, and Tetra Tech NUS. At Range Resources, he is focused on managing water resources from sourcing, transportation, treatment, storage, reuse, and disposal. He is active in the Marcellus Shale Coalition and has been the Chairman of their Waste and Recycle Subcommittee for the past 2 years. He is a Registered Professional Environmental Engineer in the State of Pennsylvania (1997), holds a BS in Civil Engineering from the University of Pittsburgh (1992), an MBA from Robert Morris University (2009) and is a Certified Project Management Professional (PMP) through the Project Management Institute.

Briana Mordick, Staff Scientist, Natural Resources Defense Council

Briana Mordick is a Staff Scientist at the Natural Resources Defense Council (NRDC). Prior to joining NRDC, she worked for Anadarko Petroleum for six years as a petroleum geologist on projects including shale gas, tight gas sands, and CO₂ enhanced oil recovery. At NRDC, she serves as a Technical Advisor on issues related to oil and natural gas extraction and geologic sequestration of carbon dioxide. This work includes the identification of regulatory solutions and industry best practices to address the environmental impacts of oil and natural gas extraction. She has written and spoken frequently on these topics including to the National Academies of Science, US EPA and the Yale Environmental Law Conference. She served as a representative to the Operations and Environment and Policy Subgroups of the 2011 National Petroleum Council Study on the Prudent Development of North American Resources and is currently a member of the Unconventional Resources Technology Advisory Committee, a Federal Advisory Committee to the Secretary of Energy. She is particularly interested in the fate and transport of fluids in the subsurface through both manmade and natural pathways related to hydraulic fracturing and drinking water. She holds a BA in Earth Sciences from Boston University and a MS in Geological Sciences from the University of North Carolina at Chapel Hill.

Peter Pope, Assistant Director, Site Remediation Section, Oil and Gas Division, Railroad Commission of Texas

Peter Pope is the Assistant Director of the Site Remediation Section, Oil and Gas Division, Railroad Commission of Texas. He has over 20 years of experience practicing hydrogeology and performing risk-based environmental assessments for private industry and public sector clients. He has expertise in aquifer characterization, fate and transport of chemicals in soil and groundwater, numerical simulations of subsurface transport processes and statistical analysis of environmental data. He has worked for the Railroad Commission of Texas since September 2001. He has a BS in Geology from Purdue University and a MA in Geology from Rice University.

John Rogers, Associate Director Division of Oil, Gas and Mining, Utah Department of Natural Resources

John Rogers is the Associate Director of the Division of Oil, Gas and Mining for the Department of Natural Resources in Utah. He manages the petroleum section that permits, monitors and regulates oil and gas production in Utah. This includes the Class II injection program and produced water disposal in Utah. He has 15 years of experience in oil and gas exploration, reservoir analysis and economic analysis of oil and gas fields. His research has included deposition and lithological studies of deep-water shales of Western Utah. He holds a BS in Geology, MS in Geology and a MBA with an emphasis in Finance from Brigham Young University.

Joseph P. Smith, Senior Research Associate, ExxonMobil Upstream Research Company

Joseph Smith is a Senior Research Associate at ExxonMobil Upstream Research Company where he serves as Senior Technical Professional Advisor for Environmental Research. After

postdoctoral appointments at the University of Wisconsin and Argonne National Laboratory, he joined Exxon Production Research Company in 1981 and has been active in research on the environmental aspects of oil and gas operations since 1990. His current research interests include the environmental aspects of water use, treatment and disposal in unconventional gas production, the environmental fate of methane in the ocean, the environmental fate and effects of marine discharges of drilling and production wastes, and the effects of seawater usage for thermal management by offshore facilities. He served on the Bureau of Ocean Energy Management, Regulation, and Enforcement's Outer Continental Shelf Scientific Committee from 2003 to 2011 and is currently co-chair of the Offshore Operators Committee Environmental Sciences Subcommittee. He is a member of the Society of Petroleum Engineers (SPE), where he serves as Associate Technical Editor for *SPE Production and Operations*, and the American Chemical Society. He holds a PhD in Physical Chemistry from the University of California at Berkeley and a BS in Chemistry from the University of Rochester.

Thomas Starosta, Environmental Engineer Consultant, Pennsylvania Department of Environmental Protection

Thomas Starosta is a Professional Engineer and Environmental Engineer Consultant with the Pennsylvania Department of Environmental Protection. For the past ten years, he has been lead engineer for calculation of water quality-based effluent limits (WQBELs) for point source discharges to surface waters in Pennsylvania. WQBELs are the effluent limits for NPDES discharges that will assure that water quality standards and criteria for conventional and toxic pollutants will be protected in rivers and streams. He maintains the computer tools, models, and technical documentation supporting the methods and bases for determination of WQBELs, and serves as a technical resource to support regional permit engineers and writers. He has broad experience related to NPDES permitting of natural gas and shale gas extraction wastewater discharges and the associated pollutants of concern, including total dissolved solids and its component solids. In addition to water quality concerns related to protection of aquatic life and potable water supply, he has been involved with controlling bromides based on their potential to produce disinfection byproducts during the chlorination process. His background in the nuclear power industry has helped Pennsylvania deal more effectively with the NORM (Naturally Occurring Radiological Materials) contained in natural gas wastewater, including radium 226/228. Based on the unique threat to water quality posed by inadequately treated natural gas and shale gas extraction wastewater, Pennsylvania regulations have greatly restricted these discharges since 2010. He has a BS in Environmental Engineering Technology from Temple University with graduate work at Penn State University.

Robert M. Summers, Secretary, Maryland Department of the Environment

Robert Summers was appointed Secretary of the Maryland Department of the Environment by Governor Martin O'Malley on April 28, 2011. He leads the Department's planning, regulatory, management and financing programs to protect public health, ensure a safe and reliable water supply, restore and protect air quality, water quality, wetlands and waterways, clean up contaminated land and ensure proper management of hazardous and solid wastes. He has served the citizens of Maryland for over 28 years in various capacities within Maryland's

progressive and nationally recognized environmental programs, with emphasis on scientific and technical issues related to water pollution control, drinking water protection and federal, state and local government environmental laws and regulations. He received his BA (1976) and PhD (1982) in Environmental Engineering from the Johns Hopkins University.

Bruce Whitteberry, Assistant Superintendent, Greater Cincinnati Water Works

Bruce Whitteberry is an Assistant Superintendent at Greater Cincinnati Water Works in the Water Quality and Treatment Division. He has 20 years of experience in the groundwater and drinking water industries. He is a member of the American Water Works Association and the National Ground Water Association. His interests include the potential effects of drilling waste fluids on ground and surface drinking water supplies. He has a BS in Geology, a MS in Hydrogeology, is a registered Professional Geologist in the State of Indiana and has a Class IV Water Treatment Operator License in the State of Ohio.

Harry Zhang, Industrial Water Resources Lead and Principal Engineer, CH2M Hill

Harry Zhang is Industrial Water Resources Lead and a Principal Engineer and at CH2M HILL. He is a Registered Professional Engineer in Virginia and Maryland. He has 18 years of diversified experience in water sustainability, water quality modeling and monitoring, watershed management, Total Maximum Daily Load development and implementation, stormwater management, groundwater contaminant transport, water resources planning, NPDES permitting, nonpoint source control, hydrologic and hydraulic analysis, source water protection, uncertainty analysis and environmental systems engineering. His recent projects include the review of regulatory and permitting requirements applicable to flowback and produced water treatment for 14 states with shale gas development. In addition, he co-authored a paper entitled "Hydraulic Fracturing in the Context of Sustainable Water Management" in the book [Contemporary Technologies for Shale-Gas Water and Environmental Management](#) published by Water Environment Federation (WEF). He is the Chair of Hydrology and Watershed Management Committee at American Water Resources Association (AWRA). He also co-chaired the certification team of the Sustainable Watershed Task Force of WEF's Sustainability Community of Practice. He is particularly interested in the issues of water lifecycle analysis and water quality management related to hydraulic fracturing and drinking water. He has a BS in Environmental Engineering, a MS in Environmental Engineering with a minor in Geo-environmental Engineering and a PhD in Environmental Engineering (Water Resources) with a minor in Systems Engineering.

Observers

Tracy Carluccio, Deputy Director, Delaware Riverkeeper Network

Tracy Carluccio is Deputy Director of Delaware Riverkeeper Network where she has been employed since 1989 and provides policy and advocacy leadership for the nonprofit environmental organization on many issues, including hydraulic fracturing for natural gas. She has 29 years of experience in water resource policy and environmental advocacy work with

nonprofit and government organizations and direct experience in environmental research, community organization, and policy development related to water management and environmental issues. She co-authored two publications for Delaware Riverkeeper Network *Stormwater Runoff, Lost Resource or Community Asset?* and *In Defense of Watersheds*, presented papers at various scientific, academic and advocacy seminars and conferences, and written articles for various publications such as “Outdoor America” (Spring 2010) and “River Voices” (Vol. 22, Number 3, 2012). She recently presented a paper *Wastewater Produced by Natural Shale Gas Production; Some Regulatory and Management Issue* at the Mid-Atlantic States Section of the Air and Waste Management Association Conference. She will guest lecture for the Princeton University Environmental Studies Undergraduate Course on December 10, 2012, on hydraulic fracturing and its impacts on water resources, focusing on policies affecting chemical use and wastewater management. She serves on the New Jersey Highlands Water Protection and Planning Council, which developed and is now implementing the Highlands Regional Master Plan for Northern New Jersey, a region covering 88 municipalities and over 850,000 acres that provides drinking water to over half of New Jersey’s residents. She also serves as chair of the East Amwell Township Board of Health in Hunterdon County New Jersey, an appointed position for the past ten years, and on other public service or nonprofit boards. She is particularly interested in the issues of chemical mixing of hydraulic fracturing fluids used to stimulate natural gas production and the treatment and processing of wastewater produced by hydraulic fracturing for natural gas, both topics she has researched for the past four years to address proposed natural gas development in the Delaware River Basin. She has a BA in Sociology from the University of North Carolina, and continuing credit course work in Stormwater Management and Subsurface Wastewater Systems from Villanova University and Rutgers Cook College.

Adam Carpenter, Government Affairs, American Water Works Association

Adam Carpenter works in American Water Works Association (AWWA) District of Columbia Government Affairs Office and serves as an expert on a diverse set of drinking water issues including climate change, hydraulic fracturing, consumer confidence reports, carbon capture and storage, the energy-water nexus, and other water and environmental issues. Along with his colleagues, he works to further AWWA’s mission of supporting clean, affordable drinking water through sound application of science into policy, source water protection, sensible regulation, public awareness, and building stakeholder consensus. He holds a BS from George Washington University in Biology, a MS from Johns Hopkins in Environmental Sciences and Policy and is pursuing a PhD in Environmental Policy from George Mason University.

Greg Dierkers, Program Director for Environmental, Energy and Transportation, National Governors Association

Greg Dierkers is a Program Director in the Environment, Energy and Transportation (EET) Division for the NGA Center, where he provides project management oversight. In this capacity he provides program and management support for NGA Center on a range of energy topics including energy efficiency and renewable energy, electricity infrastructure, carbon capture and storage, natural gas, nuclear energy, energy assurance, and transportation fuels. At NGA he has

supported NGA Chair's initiatives on energy and infrastructure and has helped author reports on clean energy finance and 'greener' fuels. Previously, he analyzed state and local transportation and energy policies at the Center for Clean Air Policy. He has a BS in Environmental Science from Bowling Green State University and a MEM in Policy and Economics from Duke University.

Dan Hill, Haudenosaunee Environmental Task Force

Dan Hill is known for his music, art and performances in Native and Non-Native audiences. As a Cayuga Nation Council Member and Cayuga Nation Representative for the Haudenosaunee Environmental Task Force and as an Environmental Technician, he is responsible to speak out for the Natural World according to his Grandmother's teachings. As a Cayuga Nation Citizen, the protection of the waters is only part of the Cycle of the Natural World and the teachings of protecting the Earth and the Life Cycle that supports us for seven generations. We are to leave the earth better than what we were given.

Stephanie Meadows, Senior Policy Advisor, Upstream Department, American Petroleum Institute

Stephanie Meadows is Senior Policy Advisor in the Upstream Department of the American Petroleum Institute (API), a national trade association representing over 500 companies involved in all aspects of the oil and natural gas industry. She currently manages and coordinates API's upstream environmental advocacy activities. In this role, she focuses on the impact of federal and state regulations and legislation on operations, the development of industry standards and best practices and cultivating strong relationships with other aligned industries, associations, and government. She joined API in March 1987 and has gained extensive industry experience in several different roles within the organization. She has been API's point person on hydraulic fracturing since 2007. She received her BS from Bowling Green State University and completed her graduate studies in Marine Affairs at the University of Virginia.