

**Curriculum Vita for
CHARLES DUANE SHACKELFORD
(latest update: 02/07/12)**

Department of Civil and Environmental
Engineering
Colorado State University
Fort Collins, Colorado 80523-1372
Phone: (970) 491-5051
Fax: (970) 491-7727
E-mail: shackel@engr.colostate.edu



EDUCATION

- Ph.D. (Civil Engineering, May 1988), University of Texas at Austin, Austin, TX 78712.
Dissertation Title: *Diffusion of Inorganic Chemical Wastes in Compacted Clay*
Advisor: Dr. David E. Daniel
- M.S. (Civil Engineering, August 1983), University of Texas at Austin.
Report Title: *Stability of Slopes Excavated in Cohesionless Soil Associated with Texas Lignite Mining*
Advisor: Dr. Stephen G. Wright
- B.S. (Civil Engineering, May 1980), Missouri University of Science and Technology, Rolla, MO 65401.
- High School Diploma (May 1973), O'Fallon Township High School, O'Fallon, IL 62269.

ACADEMIC EXPERIENCE

- Professor, Dept. of Civil and Environmental Engineering¹, Colorado State University (since July 1, 1999).
- Associate Professor, Dept. of Civil Engineering, Colorado State University (July 1, 1993-June 30, 1999).
- Assistant Professor, Dept. of Civil Engineering, Colorado State University (Jan. 6, 1988-June 30, 1993).

ADMINISTRATIVE EXPERIENCE

- Associate Department Head, Department of Civil and Environmental Engineering, Colorado State University, Fort Collins, CO 80523-1372 (Jan. 5, 2012 – present)
- Director, *Rocky Mountain Regional Hazardous Substance Research Center* for EPA Region 8 (Nov. 1, 2001 – Oct. 31, 2007).

AWARDS/HONORS/RECOGNITION

- 13 *2011 Faculty Award for Excellence in Research*, awarded by Department of Civil and Environmental Engineering, Colorado State University.

¹ Name changed from Civil Engineering to Civil and Environmental Engineering on July 1, 2006.

- 12 *2010 Outstanding Reviewer Award*, ASCE *Journal of Geotechnical and Geoenvironmental Engineering*, awarded by American Society of Civil Engineers, Reston, VA.
- 11 *Richard S. Ladd Standards Development Award*, for time and effort spent on preparing ASTM Standard Designation D7100, "*Standard Test Method for Hydraulic Conductivity Compatibility Testing of Soils with Aqueous Solutions That May Alter Hydraulic Conductivity*," awarded by ASTM Committee D18 on Soil and Rock, June 12, 2006, Toronto.
- 10 *2005 Outstanding Faculty Performance Award*, awarded by Department of Civil Engineering, Colorado State University, May 2005.
- 9 Elected to the *Academy of Civil Engineers*, Missouri University of Science and Technology (formerly University of Missouri, Rolla), April 22, 2005.
- 8 *2003 Gold Key Award* for Civil Engineering Professor of the Year, awarded by CSU Chapter of *Chi Epsilon*.
- 7 *2002 Faculty Award for Excellence in Research*, awarded by Department of Civil Engineering, Colorado State University.
- 6 *1996 Dean's Council Award of Excellence*, awarded by College of Engineering, Colorado State University.
- 5 *1995 Walter L. Huber Civil Engineering Research Prize*, awarded by American Society of Civil Engineers, Reston, VA.
- 4 *1992 National Young Investigator (NYI) Award*, awarded by National Science Foundation, Arlington, VA.
- 3 Paper entitled "Disposal Barriers that Release Contaminants Only by Molecular Diffusion" selected as one of the "ten best papers" at 1987 Oak Ridge Model Conference, TN.
- 2 *The Earth Technology Corporation Fellowship, 1985-87*, awarded by The Earth Technology Corporation, Long Beach, CA 90807 (\$24,000 award).
- 1 Engineering Foundation Fellowship, 1984-85 and 1985-86, awarded by the University of Texas, Austin.

ENGINEERING EXPERIENCE

Registered Professional Civil Engineer

- California, Registration # C 42934 (continuous since 1987)
- Colorado, Registration # 27510 (continuous since 1991)

Independent Consulting Work, 1985-Present

- Hydraulic conductivity testing of 8 compacted clay samples from the Larimer County Landfill phase 6A closure project (for Terracon Consultants, Inc., 301 North Howes Street, Fort Collins, CO 80521; Oct. 17 – Dec. 15, 2011)
- Laboratory testing (wet and dry particle-size distributions, standard and modified compaction curves, Atterberg limits, moisture contents, hydraulic conductivity) of samples collected from seven test pads in support of the Dinwoody Degradation Study (for J.R. Simplot Co. & Subsidiaries, Boise, ID, c/o Smokey Canyon Mine, Afton, WY 83110; Oct. 5, 2010 – Oct. 26, 2011).
- Large-scale hydraulic conductivity testing of two block samples recovered from an alternative cover test pad (for J.R. Simplot Co. & Subsidiaries, Boise, ID, c/o Smokey Canyon Mine, Afton, WY 83110; July 21, 2010 – August 18, 2010).
- Large-scale hydraulic conductivity testing of block samples recovered from alternative cover test pads (for J.R. Simplot Co. & Subsidiaries, Boise, ID, c/o Smokey Canyon Mine, Afton, WY 83110; Sept. 18, 2009 – March 15, 2010).
- Hydraulic conductivity testing of a compacted soil-bentonite specimen for use as a liner for the treatment ponds at the Burlington WWTP (for CTL Thompson Inc., 4001 Automation Way, Fort Collins, CO 80525; Aug. 17, 2009).
- Hydraulic conductivity testing of 16 compacted clay samples from the Larimer County Landfill Cover (for CTL Thompson Inc., 4001 Automation Way, Fort Collins, CO 80525; Sept. 23, 2008).
- Expert witness for review of evaporation pond design and performance near Colstrip, MT (for Beck, Amsden & Ruggiero PLLC, Attorneys at Law, 1946 Stadium Drive, Suite 1, Bozeman, MT 59715; Nov. 6, 2006 – April 29, 2008).
- Hydraulic conductivity testing of two compacted clay soils (for CTL Thompson Inc., 4001 Automation Way, Fort Collins, CO 80525; Nov. 2, 2007).
- Hydraulic conductivity of a compacted soil sample from soil stockpile at Connell Pit in Timnath, CO (for CTL Thompson Inc., 4001 Automation Way, Fort Collins, CO 80525; Sept. 10 – 21, 2006).
- External consultant for estimating hydraulic conductivity of drainage materials for US Highway 20 Project in Oregon (for H. W. Lockner, Inc., 5917 Sunset Drive, Cheyenne, WY 82005; Aug. 2006).
- External consultant for evaluation of potential impact on ground water resulting from leachate migration from the Kestrel Hawk Recycling and Disposal Facility, Racine, WI (for Republic Services, Inc., Kestrel Hawk RDF, 1989 Oakes Rd., Racine, WI 53406; Nov. 2003 – Feb. 2005).
- Large-scale hydraulic conductivity testing of block samples recovered from three compacted clay liner test pads at the Rocky Mountain National Arsenal (for Foster Wheeler Environmental Corporation, Rocky Mountain Arsenal, Commerce City, CO; Sept. 2001 – March 2002).
- Evaluation of the potential effects of revised process water/leachate characteristics on the hydraulic conductivity of GCLs used for base liner at the Tailings Management Area (TMA) for the proposed Nicolet Mining Company's zinc/copper mine located near Crandon, Wisconsin (for Foth & Van Dyke, Green Bay, WI; Oct. – Nov. 2001).
- Technical consultant on the Tri-State permitting project (for GeoTrans, Inc., Westminster, CO; June 2001).
- Technical consultant on clay liner to leachate compatibility testing program for the enhanced hazardous waste landfill at the Rocky Mountain National Arsenal (for GeoTrans, Inc., Westminster, CO; June 2001).
- Large-scale hydraulic conductivity testing of conglomerate bedrock samples for the High Savery Dam Project in Wyoming (for Hollingsworth & Assoc., Inc., Sheridan, CO; April and Dec. 2000).

ENGINEERING EXPERIENCE (continued)

Independent Consulting Work, 1985-Present (continued)

- Served as member of 5-year review panel for evaluation of solidification and cover system remedy at the Shattuck Chemical Superfund Site in Denver (for S. Cohen and Associates, Inc., McLean, VA; June – Nov.1999).
- Provided technical expertise in support of the GCL compatibility testing for base liner at the tailings management area for the proposed Nicolet Mining Company (NMC) zinc/copper mine located near Crandon, Wisconsin (for Foth & Van Dyke, Green Bay, WI; March – April 1999).
- Provided report on results of the testing of two soils being considered for use in the evaporation ponds at the Truba City, AZ, Uranium Mill Tailings Remedial Action disposal site as part of the groundwater remediation program (for MACTEC-ERS, 2597 B3/4 Rd., Grand Junction, CO; March – April 1999).
- Provided technical expertise for field and laboratory determination of infiltration model parameters for Arroyo Pasajero Flood Area (for Shepherd Miller, Inc., Fort Collins, CO; Feb. 1998-Aug. 1998).
- Provided technical review comments on Bozeman Superfund Solvent Site study (for Flow Technology, Bozeman, MT; April 1998).
- GCL compatibility testing for base liner at the tailings management area for the proposed Nicolet Mining Company (NMC) zinc/copper mine located near Crandon, Wisconsin (for Foth & Van Dyke, Green Bay, WI; Dec. 1997 – April 1998).
- Prepared report on "Design and Construction Recommendations for Proposed Evaporation Ponds at Lucky Mc Uranium Tailings Site, Wyoming" (for Pathfinder Mines Corp., Mills, WY; March 1997).
- Technical consultant on "Characterization of the Sodium Sulfate Solid Waste (Tailings) Disposal Facility, Owens Lake, CA" (for Shepherd Miller, Inc., Fort Collins, CO; 1996).
- Member of Technical Academic Review Group (TARG) for evaluation of Lockheed Idaho Technologies Buried Waste Integrated Demonstration (BWID) program (for Idaho National Engineering Laboratory, Idaho Falls, ID; Dec. 1994 – Sept. 1995).
- Laboratory permeability study on chemically treated and untreated soil specimens (for EG&G Idaho National Engineering Laboratory, Idaho Falls, ID; Aug. - Sept. 1994).
- Evaluation of CQA for Closure of Berry Street Mall Landfill, Roseville, CA (for State of California, Sacramento, c/o Allen, Matkins, Leck, Gamble et al., Irvine CA, and GeoLogic Assoc., Diamond Bar, CA; June 1994).
- Technical consultant to Studio Geotecnico Italiano srl, Milan, Italy, to develop laboratory and analytical capabilities for contaminant transport testing (at SGI, Milan, Italy; Jan. 4 – 14 and June 8 – Aug. 6, 1993).
- Review of design for the Gurulmundi Secure Landfill near Brisbane, Australia (for Woodward-Clyde Consultants, Denver, CO, and AGC Woodward-Clyde Pty. Ltd., Brisbane, Australia; 1992).
- Expert witness for review of permit application for the Guardian Landfill Site, Dallas County, Texas (for City of Wilmer, TX, through Sheehy, Lovelace, and Mayfield, Waco, TX; 1992).
- Expert panel member for review of macro-engineering approach for remediation of US DOE facility at Hanford, Washington (for A.T. Kearney, Richland, WA; 1992).
- External reviewer for EPA engineering bulletin on slurry walls (for Science Applications International Corporation, Cincinnati, OH; 1991).
- Technical evaluation of the geotechnical report for the permit application for the Otero County Regional Landfill expansion (for US Air Force, Holloman AFB, NM; 1991).
- Flexible-wall permeability/compatibility tests on sand/bentonite mixtures for proposed liner system (for Shepherd Miller, Inc., Fort Collins, CO; 1990).
- Contaminant transport analysis for BFI's proposed Livingston, Louisiana, hazardous waste facility (for David E. Daniel, Austin, TX; 1989).
- Report for compatibility of asphalt liner system, Rocky Mountain National Arsenal (for David E. Daniel, Austin, TX; 1987).

ENGINEERING EXPERIENCE (continued)

Independent Consulting Work, 1985-Present (continued)

- Long-term (1 year), low-gradient (2-10), flexible-wall permeability tests on two soil samples using leachate from Exxon Minerals Company's Crandon Project (EMC 21110). Monitored sulfate concentrations using ion chromatography (for David E. Daniel, Austin, TX; 1986).
- Report on the effects of effective porosity, desiccation, and attenuation by clay minerals on clay liner performance for a study on the proposed Pyott Road Sanitary Landfill, McHenry County, Illinois (for David E. Daniel, Austin, TX; 1985).

Summer Research Intern, Oak Ridge National Laboratory, Oak Ridge, Tennessee, Summer, 1984

- Field electromagnetic and geohydrologic studies of contaminant plumes for the US Nuclear Regulatory Commission at two uranium mill sites in Wyoming.

Geotechnical Engineer, Ardaman & Associates, Inc., Orlando, Florida, 1983-1984

- Analyzed and designed foundations for commercial structures. Extensive experience writing consulting reports.

Civil Design Engineer, Pacific Gas & Electric Company, San Francisco, 1980-1981

- Performed feasibility studies/quantity take-offs, structural analysis and design, earth slope stability analysis, and hydraulic analysis and design for company's nuclear (Diablo Canyon) and hydroelectric facilities.

INVITED ACTIVITIES

Invited Conference/Workshop/Meeting Presentations

- 25 Invited presentation on, "Membrane Behavior in Geosynthetic Clay Membranes," presented at the ASCE Geo-Institute's Conference *Geo-Frontiers 2011*, Dallas, TX, March 13-16, 2011.
- 24 Invited presentation on, "Critical Assessment of Radionuclide Transport through Engineered Barrier Systems for Long-Term Waste Containment," at the CRESO DOE Landfill Partnership Meeting, Bethesda, MD, Aug. 6, 2010.
- 23 Invited presentation on, "Column Testing for Measurement of Contaminant Transport Properties," at the semi-annual meeting of ASTM Committee D18.04, Denver, CO, June 24, 2008.
- 22 Invited keynote presentation on, "Remediation," at the *US-Japan Workshop on Geoenvironmental Engineering* held in conjunction with ASCE Geo-Institute's *GeoCongress 08: The Challenge of Sustainability in the Geoenvironment*, New Orleans, LA, March 7-9, 2008.
- 21 Invited presentation on, "Liners for Anaerobic Animal Waste Lagoons," at the workshop on *Improving Communication between the Colorado Livestock Association* and Colorado State University, Colorado State University, Feb. 19, 2008.
- 20 Invited presentation on, "Selected Issues Affecting the Use and Performance of GCLs in Waste Containment Applications," *21st Geotechnical Engineering Conference*, Politecnico di Torino, Torino, Italy, Nov. 27-28, 2007.
- 19 Invited presentation on, "Geotechnical Implications of Slurry Injection Soil Mixing and Fracturing," 2007 Focus Meeting of the *University Consortium for Field Focused Groundwater Contamination Research*, Brown Palace Hotel, Denver, CO, Oct. 16-17, 2007.
- 18 Invited keynote presentation on, "Environmental Issues in Geotechnical Engineering," presented at the *16th International Conference on Soil Mechanics and Geotechnical Engineering*, Osaka, Japan, Sept. 12-16, 2005.
- 17 Invited presentation on, "Comparison of Model Predictions and Field Data for an Alternative Cover in a Semiarid Climate," presented at the *Symposium on Mines and the Environment*, Rouyn-Noranda, Quebec, Canada, May 15-18, 2005.
- 16 Invited presentation on, "Resources of the Rocky Mountain Regional HSRC," presented at the *Workshop on Mining Impacted Native American Lands*, Reno, NV, Sept. 9-11, 2003.
- 15 Invited presentation on, "Research Activities at the Rocky Mountain Regional Hazardous Substance Research Center," presented at the Joint Conference of the *9th Billings Land Reclamation Symposium* and the *20th Annual Meeting of the American Society of Mining and Reclamation*, Billings, MT, June 3-6, 2003.
- 14 Invited presentation on, "Remediation of Mine Waste Sites through the Rocky Mountain Regional Hazardous Substance Research Center (RMRHSRC)," presented at *Hardrock Mining 2002: Issues Shaping the Industry*, Westminster, CO, May 7-9, 2002.
- 13 Invited presentation on, "Rocky Mountain Regional Hazardous Substance Research Center (RMRHSRC)," sponsored by Montana Tech of the University of Montana, presented at the *Mine Design, Operations and Closure Conference*, Polson, MT, April 21-25, 2002.
- 12 Invited keynote lecturer on "Coupled Solute Diffusion and Membrane Behavior of Clay Barrier Materials," presented at the International Workshop on *Clay Behaviour: Chemico-Mechanical Coupling*, Maratea, Italy, June 28-30, 2001.
- 11 Invited keynote lecturer on "Geoenvironmental Engineering for *In Situ* Remediation," presented at the *International Conference on Geotechnical and Geological Engineering (GeoEng 2000)*, sponsored by the International Society for Soil Mechanics and Geotechnical Engineering (ISSMGE), the International Society for Rock Mechanics (ISRM), and the International Society for Engineering Geology and the Environment (IAEGE), Melbourne, Australia, Nov. 19-24, 2000.

INVITED ACTIVITIES (continued)

Invited Conference/Workshop/Meeting Presentations (continued)

- 10 Invited presentation on "Measuring Chemico-Osmosis in Fine-Grained Soils," for the *International Symposium on Physical Modelling and Testing in Environmental Geotechnics*, sponsored by the Network of European Centrifuges for Environmental Geotechnics Research (NECER), La Baule, France, May 15-17, 2000.
- 9 Invited presentation on "Modeling Contaminant Transport through Waste Containment Liners," for the 17th Geotechnical Conference of Torino, *Control and Management of Subsoil Pollutants*, Torino, Italy, Nov. 23-25, 1999.
- 8 Invited state-of-the-art lecturer on "Remediation of Contaminated Land: An Overview," for the Plenary Session, *Environmental Geotechnics and Land Contamination Assessment and Remediation*, at the *XI Panamerican Conference on Soil Mechanics and Geotechnical Engineering*, Iguassu Falls, Brazil, Aug. 8-12, 1999.
- 7 Invited state-of-the-art report on "Prevention Techniques: Models and Parameters," at the *Environmental Geotechnics Symposium (SIGA '98)* sponsored by the Sao Paulo Chapter of the *Brazilian Society for Soil Mechanics and Geotechnical Engineering*, Sao Paulo, Sept. 29 & 30, 1998.
- 6 Invited state-of-the-art presentation on "Modeling and Analysis in Environmental Geotechnics: An Overview of Practical Applications," at the *2nd International Congress on Environmental Geotechnics, IS-Osaka '96*, Osaka, Japan, Nov. 5-8, 1996.
- 5 Invited state-of-the-art presentation on "Geoenvironmental Design Considerations for Tailings Dams," at the *International Symposium on Seismic and Environmental Aspects of Dams Design: Earth, Concrete and Tailings Dams*, Santiago, Chile, Oct. 14-18, *Sociedad Chilena de Geotecnia*, 1996.
- 4 Invited presentation on "Column Testing for Geoenvironmental Applications," for the conference on *Geoenvironmental Issues Facing the Americas*, sponsored by the National Science Foundation, University of Puerto Rico, Mayaguez, Sept. 21, 1994.
- 3 Invited state-of-the-art presentation on "Waste-Soil Interactions that Alter Hydraulic Conductivity," *ASTM Symposium on Hydraulic Conductivity and Waste Contaminant Transport in Soil*, San Antonio, TX, Jan. 21-22, 1993.
- 2 Invited presentation on "Contamination and Decontamination of Subsoil," for conference on *Geotechnical Aspects in the Design and Control of Waste Containment Systems*, sponsored by the Italian Geotechnical Society, held at Milazzo, Sicily, April 13-15, 1994.
- 1 Invited conference presentation on "Laboratory Diffusion Testing for Waste Disposal," *26th Annual Clay Minerals Society Meeting*, Sacramento, CA, Sept., 25-28, 1989.

Invited Seminar Presentations

- 30 Invited seminar on, "Collaborative and Interdisciplinary Research in Geoenvironmental Engineering at Colorado State University," Department of Civil and Environmental Engineering, Northeastern University, Boston, MA, Jan. 26, 2012.
- 29 Invited seminar on, "Membrane Behavior in Clay Barriers for Geoenvironmental Containment: Background, Significance, and Relevance," Department of Civil Engineering, Queen's University, Kingston, Ontario, Canada, April 28, 2010.
- 28 Invited seminar on, "Collaborative and Interdisciplinary Education and Research in Geoenvironmental Engineering at Colorado State University," Division of Engineering, Colorado School of Mines, Golden, CO, May 2005.
- 27 Invited seminar on, "Clay Membrane Barriers-Properties and Performance," Department of Civil, Architectural and Environmental Engineering, University of Missouri-Rolla, Rolla, MO, Oct. 20, 2004.

INVITED ACTIVITIES (continued)

Invited Seminar Presentations (continued)

- 26 Invited seminar on, "Evaluation of Hydrologic Models for Alternative Covers at Mine Waste Sites," for the US EPA's *Environmental Research Seminar* at the US EPA Region 8 Headquarters, Denver, CO, May 12, 2004.
- 25 Invited seminar on, "Research of the Rocky Mountain Regional Hazardous Substance Research Center," for the US EPA's *Environmental Research Seminar* at the US EPA Region 8 Headquarters, Denver, CO, May 12, 2004.
- 24 Invited seminar on, "Clay Membrane Barriers-Properties and Performance," for the Environmental Science and Engineering Program (Center for Environmental Resource Management), University of Texas at El Paso, El Paso, TX, Nov. 19, 2003.
- 23 Invited seminar on, "Clay Membrane Barriers-Properties and Performance," for the Department of Civil Engineering, Bucknell University, Lewisburg, PA, April 24, 2003.
- 22 Invited seminar on, "Long-Term Behavior of Geosynthetic Clay Liners (GCLs) Permeated with Low-Concentration Calcium Chloride Solutions," for the Department of Civil Engineering, Bucknell University, Lewisburg, PA, April 24, 2003.
- 21 Invited seminar on, "Clay Membrane Barriers-Properties and Performance," for the Department of Soil and Crop Science, Colorado State University, Fort Collins, CO, April 3, 2003.
- 20 Invited seminar on, "Flow and Transport through Clay Membrane Barriers," for the Geo-Engineering Program, University of Wisconsin-Madison, Madison, WI, May 22, 2002.
- 19 Invited seminar on, "Flow and Transport through Clay Membrane Barriers," for the Department of Environmental Engineering and Science, Colorado School of Mines, Golden, CO, March 21, 2002.
- 18 Invited seminar on, "Chemico-Osmotic Efficiency of a Geosynthetic Clay Liner," for the Department of Chemistry and Geochemistry, Colorado School of Mines, Golden, CO, Feb. 19, 2002.
- 17 Invited seminar on, "Membrane Behavior and Solute Diffusion through Clay Barrier Materials," for the Saskatoon Geotechnical Group, Saskatoon, Saskatchewan, Canada, March 6, 2000.
- 16 Invited seminar on, "Some Recent Research Regarding Containment Barrier Technology with Implications for Geoenvironmental Engineering Practice," Department of Civil and Environmental Engineering, University of Edinburgh, Edinburgh, Scotland, June 2, 1997.
- 15 Invited seminar on, "Modeling and Analysis in Environmental Geotechnics: An Overview of Practical Applications," Department of Civil and Materials Engineering, University of Illinois-Chicago, IL, Feb. 27, 1997.
- 14 Invited seminar on, "A Cumulative Mass Approach for Column Testing," Universidad Catolica de Chile, Santiago, Chile, May 10, 1994.
- 13 Invited seminar on, "Column Testing for Environmental Geotechnics: Applications, Methodologies, and Results," *Environmental Mechanics Seminar*, Department of Civil and Environmental Engineering, Duke University, Durham, NC, Dec. 7, 1993.
- 12 Invited seminar on, "Column Testing for Environmental Geotechnics: Applications, Methodologies, and Results," *Department of Civil Engineering Seminar Series*, Texas Tech University, Lubbock, TX, Nov. 15, 1993.
- 11 Invited seminar on, "Measurement of Solute Breakthrough Curves with a Flow Pump," *Geoenvironmental Engineering Seminar*, Department of Civil, Environmental, and Architectural Engineering, University of Colorado, Boulder, CO, April 8, 1993.
- 10 Invited seminar on, "The Role of Diffusion in Contaminant Migration through Soil Barriers," presented at a meeting of the Italian Geotechnical Society (Northern Group) held at the Italian National Electricity Board, Hydraulic and Structural Research Center (ENEL-CRIS), Milan, Italy, Jan. 13, 1993.
- 9 Invited seminar on, "Laboratory Testing for Flow and Transport Through Earthen Barriers: Some Implications for Applications," *Civil Engineering Colloquium*, Tufts University, Boston, MA, Sept. 15, 1992.

INVITED ACTIVITIES (continued)

Invited Seminar Presentations (continued)

- 8 Invited seminar on, "Some Practical and Theoretical Implications of Laboratory Testing for Waste Geotechnics," *Geotechnical Engineering Seminar*, Purdue University, West Lafayette, IN, March 16, 1992.
- 7 Invited seminar on, "Some Practical and Theoretical Implications of Laboratory Testing for Waste Geotechnics," *Geotechnical Engineering Seminar*, Virginia Polytechnic Institute and State University, Blacksburg, VA, Feb. 14, 1992.
- 6 Invited seminar on, "Some Practical and Theoretical Implications of Laboratory Testing for Waste Geotechnics," *Geotechnical Engineering Seminar*, University of Wyoming, Laramie, WY, Feb. 11, 1992.
- 5 Invited seminar on, "Some Practical and Theoretical Implications of Laboratory Testing for Waste Geotechnics," *Geotechnical Engineering Seminar*, University of California, Davis, CA, Feb. 3, 1992.
- 4 Invited seminar on, "Diffusion of Inorganic Chemical Wastes in Compacted Clay," *Water Resources Engineering Seminar*, Colorado State University, Fort Collins, CO, Spring, 1989.
- 3 Invited seminar on, "Diffusion of Inorganic Chemical Species in Compacted Clay," *Agricultural and Chemical Engineering Seminar*, Colorado State University, Fort Collins, CO, Fall, 1988.
- 2 Invited seminar on, "Diffusion of Inorganic Chemical Species in Compacted Clay," *Geotechnical Engineering Seminar*, University of Colorado, Boulder, CO, Spring, 1988.
- 1 Invited seminar on, "Diffusion of Inorganic Chemical Wastes in Compacted Clay," *Geotechnical Engineering Seminar*, Massachusetts Institute of Technology, Boston, MA, Spring, 1987.

Invited Course Instructor

- 10 Invited lecture presentation entitled, "Geotechnical Considerations for Redevelopment of Contaminated Sites Remediated with the ZVI-Clay Technology," for course entitled, "Ground Improvement Engineering" (CENG 452), Department of Civil and Environmental Engineering, Bucknell University, Lewisburg, PA, April 23, 2009.
- 9 Invited lecture presentation entitled, "Clay Membrane Testing Using a Flexible-Wall Apparatus," for course entitled, "Geotechnical Engineering I" (CENG 350), Department of Civil and Environmental Engineering, Bucknell University, Lewisburg, PA, Aug. 28, 2007.
- 8 Invited lecture presentation on "Waste Containment Liners," for course entitled, "Manure Management and the Environment" (AN 448/SC448), Departments of Animal Sciences and of Soil and Crop Sciences, Colorado State University, Fort Collins, CO, Oct.18, 2006.
- 7 Invited presentation to the senior class on the demands and rewards of being a university faculty member (CE 210, Senior Seminar Class), Department of Civil, Architectural and Environmental Engineering, University of Missouri-Rolla, Rolla, MO, Oct. 20, 2004.
- 6 Invited lecture presentation entitled, "Hydraulic Conductivity, Consolidation, and Membrane Behavior of Model Backfill-Slurry Mixtures for Vertical Cutoff Walls," for course entitled, "Environmental Geotechnology" (CENG 451), Department of Civil and Environmental Engineering, Bucknell University, Lewisburg, PA, April 26, 2004.
- 5 Invited lecture presentation entitled, "Liners for Ponds and Lagoons," for course entitled, "Manure Management and the Environment" (AN448/SC448), Departments of Animal Sciences and of Soil and Crop Sciences, Colorado State University, Fort Collins, CO, Oct. 13, 2002.
- 4 Invited lecture presentations (3 days, 9 hours) for course entitled, "Pollutant Transport through Soils and Remediation of Contaminated Soil," at the Federal University (COPPE) of Rio de Janeiro, Rio de Janeiro, Brazil, Aug.17, 18, and 25, 2000.
- 3 Invited lecture presentations (3 days, 15 hours) for course entitled, "Pollutant Transport through Soils and Remediation of Contaminated Soil" at the University of Sao Paulo, Sao Paulo, Brazil, Aug. 14-16, 2000.

INVITED ACTIVITIES (continued)

Invited Panel Member

- 2 Invited visiting lecturer for seminar course entitled, "Soil Liners and Covers for Landfills", Engineering Department, National University of the South (Universidad Nacional Del Sur), Bahia Blanca, Argentina, Aug. 14-18, 1995.
- 1 Invited graduate course instructor entitled, "Contaminant Migration by Diffusion", *Geotechnical Aspects of Hazardous Waste Management*, University of Colorado-Denver, Denver, CO, Fall, 1988.
- 8 Invited member of the panel on *International Collaboration in Geoenvironmental Engineering: Opportunities and Challenges*, held at the ASCE Geo-Institute's *GeoCongress 08: The Challenge of Sustainability in the Geoenvironment*, New Orleans, LA, March 10, 2008.
- 7 Invited member of the *Committee on Assessing the Performance of Surface and Subsurface Engineered Barriers*, The National Academies, Division on Earth and Life Studies, Board on Earth Sciences and Resources, 500 Fifth Street, NW, Washington, DC 20001 (August 2005-April 30, 2007).
- 6 Invited member of expert panel for review of proposals for the *Canada Foundation for Innovation*, Toronto, Ontario, Canada, Oct. 23 & 24, 2003.
- 5 Invited member of expert panel for review of proposals for the *Canada Foundation for Innovation*, Toronto, Ontario, Canada, Oct. 9 & 10, 2001.
- 4 Invited panel member for Discussion Session No. 5.3 on "Recent Developments in Containment Techniques" at the *XV International Conference on Soil Mechanics and Geotechnical [Foundation] Engineering*, Istanbul, Turkey, Aug. 27-31, 2001.
- 3 Invited featured panelist on "Landfills" for the 2nd British Geotechnical Society's *Geoenvironmental Engineering Conference*, Institute of Civil Engineers, London, September 13-15, 1999.
- 2 Invited featured workshop panelist on "Unsaturated and Saturated Moisture and Contaminant Transport" for the British Geotechnical Society's *Geoenvironmental Engineering Conference*, University of Wales, Cardiff, Wales, Sept. 16-18, 1997.
- 1 Invited panel member for Discussion Session No. 6.1 on "Pollutants Containment via Passive Barriers" at the *XIV International Conference on Soil Mechanics and Geotechnical [Foundation] Engineering*, Hamburg, Germany, Sept. 6-12, 1997.

Invited Conference/Workshop Participant

- 12 Invited participant, *CRESP (Consortium for Risk Evaluation with Stakeholder Participation) DOE Landfill Partnership Meeting*, Bethesda, MD, Aug. 6, 2010.
- 11 Invited participant, *US DOE Workshop on Landfill Technology Development*, Oak Brook, IL, Oct. 7-8, 2008.
- 10 Invited participant, *US-Japan Workshop on Geoenvironmental Engineering* held in conjunction with ASCE Geo-Institute's *GeoCongress 08: The Challenge of Sustainability in the Geoenvironment*, New Orleans, LA, March 7-9, 2008.
- 9 Invited participant, NSF sponsored workshop on "Emerging Geoenvironmental Technologies" at the University of Illinois-Chicago, Chicago, IL, Sept. 18-19, 2003.
- 8 Invited Discussor-at-Large for the session on "Management of Contaminated Sites" at the 4th International Congress on Environmental Geotechnics (4ICEG), Rio de Janeiro, Brazil, Aug. 11-15, 2002.
- 7 Invited Leader for panel on *Barrier Performance Prediction* at the DOE/EPA/DuPont sponsored *Containment Workshop 1: Performance and Verification of Barriers through Prediction and Monitoring*, Baltimore, MD, June 30-July 2, 2002.
- 6 Invited Discussion Facilitator for the "Workshop Education in Environmental Geotechnics: Overseas Practice" at the *3rd International Congress on Environmental Geotechnics*, Lisbon, Portugal, Sept. 7-11, 1998.

INVITED ACTIVITIES (continued)

Invited Conference/Workshop Participant (continued)

- 5 Invited participant, DOE/EPA/DuPont sponsored *International Containment Technology Workshop*, Baltimore, MD, Aug. 28-31, 1995.
- 4 Invited participant for *IFAI Professor Training Course for Geosynthetics*, Auburn University, Auburn, AL, July 31 - Aug. 4, 1995.
- 3 Invited participant, NSF and the Puerto Rico Industrial Development Bank Workshop on *Geoenvironmental Issues Facing the Americas*, University of Puerto Rico, Mayaguez, Puerto Rico, Sept. 21-24, 1994.
- 2 Invited participant, Civil Engineering Research Foundation (CERF) Workshop on *Defining Geo-Engineering for the 21st Century*, Xerox Document University, Leesburg, VA, May 20-21, 1994.
- 1 Invited participant, NSF US - Canada Workshop on *Recent Accomplishments and Future Trends in Geomechanics in the 21st Century*, University of Oklahoma, Norman, OK, Oct. 21-23, 1992.

TEACHING – GRADUATE

Graduate Courses

Course No.	Course Title	Year	Semester	No. of Students	Evaluation ¹	
CE 550	Foundation Engineering	1994	Fall	30	4.3	
CE 550		1992	Fall	23	4.5	
CIVE 558	Containment Systems for Waste Disposal	2011	Fall	6	4.8	
CIVE 558		2010	Fall	8	4.7	
CIVE 558		2008	Fall	7	5.0	
CIVE 558		2007	Fall	6	4.8	
CE 558		2005	Fall	4	5.0	
CE 558		2004	Fall	6	5.0	
CE 558		2001	Fall	11	4.7	
CE 558		2000	Fall	14	4.9	
CE 592		Geotechnical Engineering Seminar	1998	Spring	12	4.8
CE 592			1991	Fall	?	NA
CE 592	1989		Fall	11	NA	
CE 633	Groundwater Contaminant Transport Modeling	1992	Fall	13	4.8	
CE 633		1991	Fall	21	4.7	
CIVE 655	Advanced Soil Mechanics	2010	Fall	7	4.9	
CIVE 655		2008	Fall	6	4.5	
CE 655		2006	Fall	5	4.4	
CE 655		2004	Spring	6	4.0	
CE 655		1999	Fall	2	5.0	
CE 655		1997	Fall	6	5.0	
CE 655		1994	Fall	9	4.5	
CE 655		1993	Fall	8	4.3	
CE 655		1990	Fall	12	3.8	
CE 657		Geoenvironmental Engineering Principles	1998	Fall	4	5.0
CE 657	1997		Fall	6	4.5	
CE 681	1996		Fall	6	4.6	
CE 681	1995		Fall	14	4.4	
CIVE 658	Remediation Systems for Subsurface Contamination	2011	Spring	7	5.0	
CIVE 658		2009	Spring	7	5.0	
CE 658		2007	Spring	6	4.7	
CE 658		2006	Spring	8	4.7	
CE 658		2002	Spring	7	4.7	
CE 658		1998	Spring	8	4.8	
CE 680		1997	Spring	16	4.8	
CE 754		1996	Spring	11	4.8	
CE 680		Geotechnics of Waste Management	1994	Spring	13	4.8
CE 680	1992		Spring	8	5.0	
CE 696	Geotechnical Engineering for Waste Management	1990	Spring	11	3.9	
CE 696	Environ. Geotech. for Waste Management	1989	Spring	13	4.9	
CE 752	Physico-Chemical Aspects of Soil Engineering	1988	Spring	9	NA	
CE 754	Special Topics: Geotechnics of Unsaturated Soils	1998	Spring	9	4.0	
				Σ = 396	4.6²	

¹ Based on response to question #23 of standard student course survey: "How do you rate this instructor?" where 5 = excellent, 4 = above average, 3 = average, 2 = below average, 1 = poor

² Based on 376 student responses

TEACHING – GRADUATE (continued)

Graduate Courses Developed

- CE 592 – Seminar: Technical Writing and Publications (Spring 1998)
- CIVE 558 (previously CE 558, CE 657 & CE 681) – Containment Systems for Waste Disposal (Fall 1997)
- CE 658 (previously CE 658, CE 680 & CE 754) – Remediation Systems for Subsurface Contamination (Spring 1998)
- CE 680 (previously CE 692) – Geotechnics of Waste Management (Spring 1992)
- CE 754 – Special Topics: Geotechnics of Unsaturated Soils (Spring 1998)

TEACHING – UNDERGRADUATE

Undergraduate Courses

Course No.	Course Title	Year	Semester	No. of Students	Evaluation ¹	
CE 256	Statics for Non-Engineers	1998	Fall	76	3.3	
CE 256		1996	Fall	69	4.7	
CE 260	Engineering Mechanics: Statics	1999	Fall	72	4.2	
CE 260		1989	Spring	43	3.8	
CE 261	Engineering Mechanics: Dynamics	2000	Spring	52	4.4	
CE 261		1999	Spring	42	4.5	
CE 261		1989	Fall	27	4.5	
CE 262	Engineering Mechanics: Statics & Dynamics	1993	Fall	52	3.5	
CE 350	Soil Mechanics for Non-Engineers	1991	Fall	54	2.5	
CE 350		1990	Fall	68	4.2	
CE 350		1989	Fall	59	4.2	
CE 350		1988	Fall	87	NA	
CE 423	Groundwater Engineering	1991	Spring	30	4.1	
CIVE 355	Introduction to Geotechnical Engineering	2011	Spring	39	4.1	
CIVE 355		2010	Spring	37	4.0	
CIVE 355		2009	Spring	35	4.1	
CIVE 450		2008	Spring	75	4.2	
CE 450		2007	Spring	73	4.3	
CE 450		2003	Spring	81	4.2	
CE 450		2001	Spring	67	4.6	
CE 450		2000	Spring	66	4.4	
CE 450		1999	Spring	62	4.3	
CE 450		1997	Spring	74	4.2	
CE 450		1995	Spring	97	3.6	
CE 450		1993	Spring	61	4.1	
CE 450		1992	Spring	88	4.4	
CE 450		1991	Spring	70	4.2	
CE 450		1990	Spring	86	3.9	
CIVE 455		Applications in Geotechnical Engineering	2011	Fall	9	5.0
CIVE 455			2010	Fall	4	4.8
CIVE 455			2009	Fall	8	5.0
CIVE 455			2008	Fall	6	4.8
CE 496		Introduction to Environmental Geotechnics	1993	Spring	17	4.5
				Σ = 1,786	4.1²	

Undergraduate Courses Developed

- CIVE 455 – Applications in Geotechnical Engineering (Fall 2008)
- CE 496 – Introduction to Environmental Geotechnics (Spring 1993)

¹ Based on response to question #23 of standard student course survey: "How do you rate this instructor?" where 5 = excellent, 4 = above average, 3 = average, 2 = below average, 1 = poor

² Based on 1699 student responses

TEACHING – PROFESSIONAL

Professional Short Courses-Participation

- *Liners and Covers for Waste Containment Facilities*, sponsored by ASCE Geo-Institute, (with Craig Benson, David Daniel, and Majdi Othman):
 - Nov. 14-16, 2001, Atlanta, GA (44 registrants)
 - Nov. 6-8, 2000, Los Angeles, CA (42 registrants)
 - Nov. 8-10, 1999, Denver, CO (41 registrants)
 - Oct. 26-28, 1998, Rosemont, IL (49 registrants)
- *Unsaturated Soils in Engineering Practice*, sponsored by ASCE Geo-Institute, Aug. 4, 2000, Denver, CO (with Craig Benson, Delwyn Fredlund, Sandra Houston, Fernando Marinho, and Ward Wilson).
- *Soil Liners and Covers for Landfills in South America*, through CoHemis, University of Puerto Rico, Mayaguez, Puerto Rico (sponsored by Caterpillar Inc.), June 12-30, 1995:
 - June 12-13, Mexico City, Mexico (with Craig Benson)
 - June 15-16, San Jose, Costa Rica (with Craig Benson)
 - June 20-21, Bogota, Columbia (with Craig Benson)
 - June 22-23, Quito, Ecuador
 - June 26-27, Santiago, Chile
 - June 29-30, Cordoba, Argentina
- *Design and Construction of Landfill Liners for Waste Containment*, May 12-13, 1994, Universidad Catolica de Chile, Santiago, Chile.
- *Soil Liners and Covers for Landfills*, Jan. 17-18, 1994, Department of Civil Engineering, Colorado State University, Ft. Collins, CO (with Craig Benson).
- *Soil, Geomembrane, and Composite Liners and Covers for Landfills*, College of Engineering, Department of Engineering Professional Development, University of Wisconsin, Madison (with Craig Benson and Joseph Fluet):
 - Oct. 20-22, 1997, Madison, WI.
 - Oct. 28-30, 1996, Madison, WI.
 - Nov. 13-15, 1995, Saratoga Springs, NY.
 - May 23-25, 1995, at the University of Wisconsin, Madison, WI.
 - Jan. 30 - Feb. 1, 1995, at UCLA, Los Angeles.
 - May 23-25, 1994, at the University of Wisconsin, Madison, WI.
 - Jan. 31 - Feb. 2, 1994, at UCLA, Los Angeles, CA.
 - June 2-4, 1993, at the University of Wisconsin, Madison, WI.
 - June 1-3, 1992, at the University of Wisconsin, Madison, WI.
- *Soil Liners and Covers for Landfills*, College of Continuing Studies, April 13-15, 1993, University of Alabama, Tuscaloosa, AL (with Craig Benson).
- *Advanced Sanitary Landfill Design and Management*, College of Engineering, Department of Engineering Professional Development, University of Wisconsin, Madison (with Craig Benson):
 - Oct. 17-19, 1994, for US EPA Region 6, Kansas City, MO.
- *Principles of Contaminant Transport for Geotechnical Engineers and Other Waste Management Professionals*, American Society of Civil Engineers, New York:
 - Sept. 18, 1992, at New York, NY.
 - Oct. 3, 1992, at San Francisco, CA.
- Session on "Waste Containment Liners" for *Tailings, Engineering, and Management*, Nov. 26-30, 1990, Department of Civil Engineering, Colorado State University, Fort Collins, CO.

PUBLICATIONS

Journals

- 66 Olson, M.R., Sale, T.C., Shackelford, C.D., Bozzini, C., and Skeean, J. (2012). "Chlorinated solvent source-zone remediation via ZVI-clay soil mixing: One-year results." *Ground Water Monitoring and Remediation*, Wiley-Blackwell Publishing, Hoboken, NJ, [in press](#).
- 65 Sample, K.M. and [Shackelford, C.D.](#) (2012). "Apparatus for constant rate-of-strain consolidation of slurry mixed soils." *Geotechnical Testing Journal*, ASTM, 35(3), [in press](#).
- 64 Joo, J.-C., [Shackelford, C.D.](#), and Reardon, K.F. (2012). "Lumping analysis for sorption of neutral organic compounds in mixtures to simulated aquifer sorbents." *Journal of Environmental Engineering*, ASCE, 138(5), [in press](#).
- 63 Hong, C. S.-J., [Shackelford, C.D.](#), and Malusis, M.A. (2012). "Consolidation and hydraulic conductivity of zeolite amended soil-bentonite backfills." *Journal of Geotechnical and Geoenvironmental Engineering*, ASCE, 138(1), [in press](#).
- 62 Kang, J.-B. and [Shackelford, C.D.](#) (2011). "Consolidation enhanced membrane behavior of a geosynthetic clay liner." *Geotextiles and Geomembranes*, Elsevier, Amsterdam, 29(6), 544-556, [doi:10.1016/j.geotexmem.2011.07.002](https://doi.org/10.1016/j.geotexmem.2011.07.002).
- 61 Joo, J.-C., [Shackelford, C.D.](#), and Reardon, K.F. (2011). "Sorption of neutral organic compounds in mixtures to mineral surfaces and humic acid-mineral complexes." *Journal of Hazardous, Toxic, and Radioactive Waste Management*, ASCE, 15(3), 188-198, [doi: 10.1061/\(ASCE\)HZ.1944-8376.0000070](https://doi.org/10.1061/(ASCE)HZ.1944-8376.0000070).
- 60 Castelbaum, D., Olson, M.R., Sale, T.C., and [Shackelford, C.D.](#) (2011). "Laboratory apparatus and procedures for preparing test specimens of slurry mixed soils." *Geotechnical Testing Journal*, ASTM, 34(1), paper ID: GTJ102981; [doi: 10.1520/GTJ102981](https://doi.org/10.1520/GTJ102981).
- 59 Kang, J.-B. and [Shackelford, C.D.](#) (2010). "Membrane behavior of compacted clay liners." *Journal of Geotechnical and Geoenvironmental Engineering*, ASCE, 136(10), 1368-1382, [doi: 10.1061/\(ASCE\)GT.1943-5606.0000358](https://doi.org/10.1061/(ASCE)GT.1943-5606.0000358).
- 58 Hemsli, P.S., [Shackelford, C.D.](#), and Figueroa, L.A. (2010). "Calibration of reactive transport models for remediation of mine drainage in solid-substrate bio-columns." *Journal of Environmental Engineering*, ASCE, 136(9), 914-925, [doi: 10.1061/ ASCE_EE.1943-7870.0000234](https://doi.org/10.1061/ASCE_EE.1943-7870.0000234).
- 57 Malusis, M.A., Maneval, J.E., Barben, E.J., [Shackelford, C.D.](#), and Daniels, E.R. (2010). "Influence of adsorption on phenol transport through soil-bentonite vertical barriers amended with activated carbon." *Journal of Contaminant Hydrology*, Elsevier, Amsterdam, 116(1-4), 58-72, [doi:10.1016/j.conhyd.2010.06.001](https://doi.org/10.1016/j.conhyd.2010.06.001).
- 56 [Shackelford, C.D.](#), Sevic, G.W., and Eykholt, G.R. (2010). "Hydraulic conductivity of geosynthetic clay liners to tailings impoundment solutions." *Geotextiles and Geomembranes*, Elsevier, Amsterdam, 28(2), 149-162, [doi: 10.1016/j.geotexmem.2009.10.005](https://doi.org/10.1016/j.geotexmem.2009.10.005).
- 55 Joo, J.-C., Reardon, K.F., [Shackelford, C.D.](#), and Wilmetti, J.F. (2010). "Electromagnetically vibrated solid-phase microextraction for the analysis of organic compounds." *International Journal of Environmental Technology and Management*, Inderscience Publ., Olney, Bucks, UK, 12(2-4), 393-406.
- 54 Kang, J.-B. and [Shackelford, C.D.](#) (2010). "Consolidation of a geosynthetic clay liner under isotropic states of stress." *Journal of Geotechnical and Geoenvironmental Engineering*, ASCE, 136(1), 253-259, [doi: 10.1061/\(ASCE\)GT.1943-5606.0000181](https://doi.org/10.1061/(ASCE)GT.1943-5606.0000181).
- 53 Castelbaum, D. and [Shackelford, C.D.](#) (2009). "Hydraulic conductivity of bentonite slurry mixed sands." *Journal of Geotechnical and Geoenvironmental Engineering*, ASCE, 135(12), 1941-1956, [doi: 10.1061/\(ASCE\)GT.1943-5606.0000169](https://doi.org/10.1061/(ASCE)GT.1943-5606.0000169).
- 52 Kang, J.-B. and [Shackelford, C.D.](#) (2009). "Clay membrane testing using a flexible-wall cell under closed-system boundary conditions." *Applied Clay Science*, Elsevier, Amsterdam, 44(1-2), 43-58, [doi:10.1016/j.clay.2009.01.006](https://doi.org/10.1016/j.clay.2009.01.006).

PUBLICATIONS (continued)

Journals (continued)

- 51 Bohnhoff, G.L., Ogorzalek, A.S., Benson, C.H., Shackelford, C.D., and Apiwantragoon, P. (2009). "Field data and water-balance predictions for a monolithic cover in a semiarid climate." *Journal of Geotechnical and Geoenvironmental Engineering*, ASCE, 135(3), 334-348, [doi:10.1061/\(ASCE\)1090-0241\(2009\)135:3\(333\)](https://doi.org/10.1061/(ASCE)1090-0241(2009)135:3(333)).
- 50 Hong, C. S.-J., Davis, M.M., and Shackelford, C.D. (2009). "Non-reactive solute diffusion in unconfined and confined specimens of a compacted clay soil." *Waste Management*, Elsevier, Amsterdam, 29(1), 404-417, [doi:10.1016/j.wasman.2008.04.003](https://doi.org/10.1016/j.wasman.2008.04.003).
- 49 Evans, J.C., Shackelford, C.D., Yeo, S.-S., and Henning, J. (2008). "Membrane behavior of soil-bentonite slurry-trench cutoff walls." *Soil and Sediment Contamination – An International Journal*, Taylor & Francis, London, 17(4), 316-322, [doi:10.1080/15320380802143880](https://doi.org/10.1080/15320380802143880).
- 48 Ogorzalek, A.S., Bohnhoff, G.L., Shackelford, C.D., Benson, C.H., and Apiwantragoon, P. (2008). "Comparison of field data and water-balance predictions for a capillary barrier cover." *Journal of Geotechnical and Geoenvironmental Engineering*, ASCE, 134(4), 470-486, [doi:10.1061/\(ASCE\)1090-0241\(2008\)134:4\(470\)](https://doi.org/10.1061/(ASCE)1090-0241(2008)134:4(470)).
- 47 Joo, J.-C., Shackelford, C.D., and Reardon, K.F. (2008). "Sorption of nonpolar neutral organic compounds to humic acid-coated sand: Contributions of organic and mineral components." *Chemosphere*, Elsevier, Amsterdam, 70(7), 1290-1297, [doi:10.1016/j.chemosphere.2007.07.052](https://doi.org/10.1016/j.chemosphere.2007.07.052).
- 46 Joo, J.-C., Shackelford, C.D., and Reardon, K.F. (2008). "Association of humic acid with metal (hydr)oxide-coated sands at solid-water interfaces." *Journal of Colloid and Interface Science*, Elsevier, Amsterdam, 317(2), 424-433, [doi:10.1016/j.jcis.2007.09.061](https://doi.org/10.1016/j.jcis.2007.09.061).
- 45 Brown, L.C. and Shackelford, C.D. (2007). "Hydraulic conductivity of a geosynthetic clay liner to a simulated animal waste solution." *Transactions of the American Society of Agricultural and Biological Engineers*, ASABE, 50(3), 831-841.
- 44 Henning, J., Evans, J.C., and Shackelford, C.D. (2006). "Membrane behavior of two backfills from field-constructed soil-bentonite cutoff walls." *Journal of Geotechnical and Geoenvironmental Engineering*, ASCE, 132(10), 243-249, [doi:10.1061/\(ASCE\)1090-0241\(2006\)132:10\(243\)](https://doi.org/10.1061/(ASCE)1090-0241(2006)132:10(243)).
- 43 Hemsli, P.S. and Shackelford, C.D. (2006). "An evaluation of the influence of aquifer heterogeneity on permeable reactive barrier design." *Water Resources Research*, AGU, 42, W03402, [doi:10.1029/2005WR004629](https://doi.org/10.1029/2005WR004629).
- 42 Shackelford, C.D. and Lee, J.-M. (2005). "Analyzing diffusion by analogy with consolidation." *Journal of Geotechnical and Geoenvironmental Engineering*, ASCE, 131(11), 1345-1359, [doi:10.1061/\(ASCE\)1090-0241\(2005\)131:11\(1345\)](https://doi.org/10.1061/(ASCE)1090-0241(2005)131:11(1345)).
- 41 Lee, J.-M., Shackelford, C.D., Benson, C.H., Jo, H.-Y., and Edil, T. (2005). "Correlating index properties and hydraulic conductivity of geosynthetic clay liners." *Journal of Geotechnical and Geoenvironmental Engineering*, ASCE, 131(11), 1319-1329, [doi:10.1061/\(ASCE\)1090-0241\(2005\)131:11\(1319\)](https://doi.org/10.1061/(ASCE)1090-0241(2005)131:11(1319)).
- 40 Yeo, S.-S., Shackelford, C.D., and Evans, J.C. (2005). "Consolidation and hydraulic conductivity of nine model soil-bentonite backfills." *Journal of Geotechnical and Geoenvironmental Engineering*, ASCE, 131(10), 1189-1198, [doi: 10.1061/\(ASCE\)1090-0241\(2005\)131:10\(1189\)](https://doi.org/10.1061/(ASCE)1090-0241(2005)131:10(1189)).
- 39 Lee, J.-M. and Shackelford, C.D. (2005). "Concentration dependency of the prehydration effect for a geosynthetic clay liner." *Soils and Foundations*, JGS, 45(4), 27-41.
- 38 Hemsli, P.S., Shackelford, C.D., and Figueroa, L.A. (2005). "Modeling the influence of decomposing organic solids on sulfate reduction rates for iron precipitation." *Environmental Science and Technology*, ACS, 39(9), 3215-3225, [doi:10.1021/es0486420](https://doi.org/10.1021/es0486420).
- 37 Yeo, S.-S., Shackelford, C.D., and Evans, J.C. (2005). "Membrane behavior of model soil-bentonite backfill mixtures." *Journal of Geotechnical and Geoenvironmental Engineering*, ASCE, 131(4), 418-429, [doi:10.1061/\(ASCE\)1090-0241\(2005\)131:4\(418\)](https://doi.org/10.1061/(ASCE)1090-0241(2005)131:4(418)).

PUBLICATIONS (continued)

Journals (continued)

- 36 Jo, H.-Y., Benson, C.H., Shackelford, C.D., Lee, J.-M. and Edil, T.B. (2005). "Long-term hydraulic conductivity of a geosynthetic clay liner (GCL) permeated with inorganic salt solutions." *Journal of Geotechnical and Geoenvironmental Engineering*, ASCE, 131(4), 405-417, [doi:10.1061/\(ASCE\)1090-0241\(2005\)131:4\(405\)](https://doi.org/10.1061/(ASCE)1090-0241(2005)131:4(405)).
- 35 Lee, J.-M. and Shackelford, C.D. (2005). "Solution retention capacity as an alternative to the swell index test for sodium bentonite." *Geotechnical Testing Journal*, ASTM, 28(1), 61-70. [doi:10.1520/GTJ12520](https://doi.org/10.1520/GTJ12520).
- 34 Lee, J.-M. and Shackelford, C.D. (2005). "Impact of bentonite quality on hydraulic conductivity of geosynthetic clay liners." *Journal of Geotechnical and Geoenvironmental Engineering*, ASCE, 131(1), 64-77, [doi:10.1061/\(ASCE\)1090-0241\(2005\)131:1\(64\)](https://doi.org/10.1061/(ASCE)1090-0241(2005)131:1(64)).
- 33 Lee, J.-M., Shackelford, C.D., Choi, J.-S., and Jung, M.-K. (2004). "Dependency of compatibility termination criteria on prehydration and bentonite quality for geosynthetic clay liners." *Journal of the Korean Geotechnical Society*, 20(7), 141-158.
- 32 Malusis, M.A. and Shackelford, C.D. (2004). "Explicit and implicit coupling during solute transport through clay membrane barriers." *Journal of Contaminant Hydrology*, Elsevier, Amsterdam, 72(1-4), 259-285, [doi:10.1016/j.jconhyd.2003.12.002](https://doi.org/10.1016/j.jconhyd.2003.12.002).
- 31 Malusis, M.A. and Shackelford, C.D. (2004). "Predicting solute flux through a clay membrane barrier." *Journal of Geotechnical and Geoenvironmental Engineering*, ASCE, 130(5), 477-487, [doi:10.1061/\(ASCE\)1090-0241\(2004\)130:5\(477\)](https://doi.org/10.1061/(ASCE)1090-0241(2004)130:5(477)).
- 30 Malusis, M.A., Shackelford, C.D., and Olsen, H.W. (2003). "Flow and transport through clay membrane barriers." *Engineering Geology*, Elsevier, Amsterdam, 70(2-3), 235-248.
- 29 Shackelford, C.D. and Lee, J.-M. (2003). "The destructive role of diffusion on clay membrane behavior." *Clays and Clay Minerals*, CMS, 51(2), 187-197.
- 28 Malusis, M.A. and Shackelford, C.D. (2002). "Theory for reactive solute transport through clay membrane barriers." *Journal of Contaminant Hydrology*, Elsevier, Amsterdam, 59(3-4), 291-316.
- 27 Malusis, M.A. and Shackelford, C.D. (2002). "Coupling effects during steady-state solute diffusion through a semipermeable clay membrane." *Environmental Science and Technology*, ACS, 36(6), 1312-1319, [doi:10.1021/es011130q](https://doi.org/10.1021/es011130q).
- 26 Malusis, M.A. and Shackelford, C.D. (2002). "Chemico-osmotic efficiency of a geosynthetic clay liner." *Journal of Geotechnical and Geoenvironmental Engineering*, ASCE, 128(2), 97-106, [doi:10.1061/\(ASCE\)1090-0241\(2002\)128:2\(97\)](https://doi.org/10.1061/(ASCE)1090-0241(2002)128:2(97)).
- 25 Munoz, J.F., Suazo, A., Rengifo, P., Shackelford, C.D., and Vauclin, M. (2001). "In-situ acid leaching of copper tailings: A case history." *The Canadian Mining and Metallurgical Bulletin*, 94(1056), 81-87.
- 24 Burger, C.A. and Shackelford, C.D. (2001). "Soil-water characteristic curves and dual porosity of sand-diatomaceous earth mixtures." *Journal of Geotechnical and Geoenvironmental Engineering*, ASCE, 127(9), 790-800.
- 23 Malusis, M.A., Shackelford, C.D., and Olsen, H.W. (2001). "A laboratory apparatus to measure chemico-osmotic efficiency coefficients for clay soils." *Geotechnical Testing Journal*, ASTM, 24(3), 229-242.
- 22 Burger, C.A. and Shackelford, C.D. (2001). "Evaluating dual porosity of pelletized diatomaceous earth using bimodal soil water characteristic curve functions." *Canadian Geotechnical Journal*, NRC, 38(1), 53-66.
- 21 Chiu, T.-F. and Shackelford, C.D. (2000). "Laboratory evaluation of sand underdrains." *Journal of Geotechnical and Geoenvironmental Engineering*, ASCE, 126(11), 990-1001.
- 20 Shackelford, C.D., Benson, C.H., Katsumi, T., Edil, T.B., and Lin, L. (2000). "Evaluating the hydraulic conductivity of GCLs permeated with non-standard liquids." *Geotextiles and Geomembranes*, Elsevier, Amsterdam, 18(2-4), 133-161.

PUBLICATIONS (continued)

Journals (continued)

- 19 Shackelford, C.D., Malusis, M.A., Majeski, M. J., Stern, R.T. (1999). "Electrical conductivity breakthrough curves." *Journal of Geotechnical and Geoenvironmental Engineering*, ASCE , 125(4), 260-270.
- 18 Cotten, T.E., Davis, M.M., and Shackelford, C.D. (1998). "Effect of test duration and specimen length on diffusion testing of unconfined specimens." *Geotechnical Testing Journal*, ASTM, 21(2):79-94.
- 17 Stern, R.T. and Shackelford, C.D. (1998). "Permeation of sand-processed clay mixtures with calcium chloride solutions." *Journal of Geotechnical and Geoenvironmental Engineering*, ASCE, 124(3), 231-241.
- 16 Chiu, T.-F. and Shackelford, C.D. (1998). "Unsaturated hydraulic conductivity of compacted sand-kaolin mixtures." *Journal of Geotechnical and Geoenvironmental Engineering*, ASCE, 124(2), 160-170.
- 15 Howell, J.L., Shackelford, C.D., Amer, N.H., and Stern, R.T. (1997). "Compaction of sand-processed clay soil mixtures." *Geotechnical Testing Journal*, ASTM, 20(4), 443-458.
- 14 Shackelford, C.D. and Glade, M. (1997). "Analytical mass leaching model for contaminated soil and soil stabilized waste." *Journal of Ground Water*, AGWSE, 35(2), 233-242.
- 13 Shackelford, C.D., Cotten, T.E., Rohal, K., and Strauss, S. (1997). "Acid buffering a high pH soil for zinc diffusion." *Journal of Geotechnical and Geoenvironmental Engineering*, ASCE, 123(3), 260-271.
- 12 Shackelford, C.D. (1995). "Cumulative mass approach for column testing." *Journal of Geotechnical Engineering*, ASCE, 121(10), 696-703.
- 11 Shackelford, C.D. and Redmond, P. (1995). Solute breakthrough curves for processed kaolin at low flow rates. *Journal of Geotechnical Engineering*, ASCE, 121(1), 17-32.
- 10 Redmond, P. and Shackelford, C.D. (1994). "Design and evaluation of a flow pump system for column testing." *Geotechnical Testing Journal*, ASTM, 17(3), 269-281.
- 9 Shackelford, C.D. (1994). "Critical concepts for column testing." *Journal of Geotechnical Engineering*, ASCE, 120(10), 1804-1828.
- 8 Manassero, M. and Shackelford, C.D. (1994). "The role of diffusion in contaminant migration through soil barriers." *Italian Geotechnical Journal (Rivista Italiana di Geotecnica)*, 28(1), 5-31 (in English and Italian).
- 7 Shackelford, C.D. and Javed, F. (1991). "Large-scale laboratory permeability testing of a compacted clay soil." *Geotechnical Testing Journal*, ASTM, 14(2), 171-179.
- 6 Shackelford, C.D. (1991). "Laboratory diffusion testing for waste disposal - A review." *Journal of Contaminant Hydrology*, Elsevier, Amsterdam, 7(3),177-217.
- 5 Shackelford, C.D. and Daniel, D.E. (1991). "Diffusion in saturated soil: II. Results for compacted clay." *Journal of Geotechnical Engineering*, ASCE, 117(3), 485-506.
- 4 Shackelford, C.D. and Daniel, D.E. (1991). "Diffusion in saturated soil: I. Background." *Journal of Geotechnical Engineering*, ASCE, 117(3), 467-484.
- 3 Shackelford, C.D. (1990). "Transit-time design of earthen barriers." *Engineering Geology*, Elsevier, Amsterdam, 29(1), 79-94.
- 2 Shackelford, C.D., Daniel, D.E., and Liljestrand, H.M. (1989). "Diffusion of inorganic chemical species in compacted clay soil." *Journal of Contaminant Hydrology*, Elsevier, Amsterdam, 4(3), 441-473.
- 1 Daniel, D.E. and Shackelford, C.D. (1988). "Disposal barriers that release contaminants only by molecular diffusion." *Nuclear and Chemical Waste Management*, 8, 299-305.

PUBLICATIONS (continued)

Refereed Special Technical Publications (ASCE, ASTM, TRB)

- 14 Shackelford, C.D. (2012). "Membrane behavior of engineered clay barriers for geoenvironmental containment: State of the art." *GeoCongress 2012-State of the Art and Practice in Geotechnical Engineering*, Oakland, CA, March 25-29, 2012 (CD-ROM), ASCE, Reston, VA, in press.
- 13 Scalia, J. Benson, C.H, Edil, T.B., Bohnhoff, G.L., and Shackelford, C.D. (2011). "Geosynthetic clay liners containing bentonite polymer nanocomposite." *Geo-Frontiers 2011*, Dallas, TX, March 13-16, 2011, (CD-ROM) ASCE, Reston, VA, 2001-2009.
- 12 Shackelford, C.D. (2011). "Membrane behavior in geosynthetic clay liners." *Geo-Frontiers 2011*, Dallas, TX, March 13-16, 2011, (CD-ROM) ASCE, Reston, VA, 1961-1970.
- 11 Fox, P.J. and Shackelford, C.D. (2010). "State-of-the-art: Consolidation-induced contaminant transport for high water content geo-materials." *GeoFlorida 2010*, West Palm Beach, FL, Feb. 20-24, 2010, (CD-ROM) ASCE, Reston, VA, 129-138.
- 10 Shackelford, C.D. and Benson, C.H. (2006). "Selected factors affecting water-balance predictions for alternative covers using unsaturated flow models." *GeoCongress 2006*, D. J. DeGroot, J. T. DeJong, J. D. Frost. And L. G. Baise, Eds., Atlanta, GA, Feb. 26-Mar. 1, 2006, (CD_ROM) ASCE, Reston, VA.
- 9 Shackelford, C.D., Sale, T.C. and Liberati, M. (2005). "*In-situ* remediation of chlorinated solvents using zero valent iron and kaolin mixtures: A case history." *Waste Containment and Remediation*, A. Alshawabkeh, C.H. Benson, P.J. Culligan, J.C. Evans, B.A Gross, D. Narejo, K.R. Reddy, C.D. Shackelford, J.G. Zornberg, Eds., Geotechnical Special Publication 142 (CD-ROM), ASCE, Reston, VA.
- 8 Benson, C.H., Bohnhoff, G.L., Ogorzalek, A.S., Shackelford, C.D., Apinwantragoon, P., and Albright, W.H. (2005). "Field data and model predictions for an alternative cover." *Waste Containment and Remediation*, A. Alshawabkeh, C. H. Benson, P. J. Culligan, J. C. Evans, B. A Gross, D. Narejo, K. R. Reddy, C. D. Shackelford, J. G. Zornberg, Eds., ASCE Geotechnical Special Publication 142 (CD-ROM), ASCE, Reston, VA.
- 7 Shackelford, C.D. (1995). "Column testing for geoenvironmental applications." *Geo-Environmental Issues Facing the Americas*, E.J. Macari, J. D. Frost, and L.F. Pumarada, Eds., Geotechnical Special Publication 47, ASCE, Reston, VA, 117-125.
- 6 Shackelford, C.D. (1995). "Analytical models for cumulative mass column testing." *Geoenvironment 2000*, Y.B. Acar and D.E. Daniel, Eds., Geotechnical Special Publication 46, ASCE, Reston, VA, 355-372.
- 5 Wright, L. and Shackelford, C.D. (1995). "Compatibility of fly ash-soil mixtures to acetic acid." *Geoenvironment 2000*, Y.B. Acar and D. E. Daniel, Eds., Geotechnical Special Publication 46, ASCE, Reston, VA, 196-212.
- 4 Shackelford, C.D. (1994). "Waste-soil interactions that alter hydraulic conductivity." *Hydraulic Conductivity and Waste Contaminant Transport in Soil*, D.E. Daniel and S.J. Trautwein, Eds., STP 1142, ASTM, West Conshohoken, PA, 111-168.
- 3 Shackelford, C.D. and Glade, M. (1994). "Constant-flow and constant-gradient hydraulic conductivity tests on sand-bentonite-fly ash mixtures." *Hydraulic Conductivity and Waste Contaminant Transport in Soil*, D.E. Daniel and S.J. Trautwein, Eds., STP 1142, ASTM, West Conshohoken, PA, 521-545.
- 2 Creek, D.N. and Shackelford, C.D. (1992). "Permeability and leaching characteristics of fly ash liner materials." *Soils, Geology, and Foundations*, Geoenvironmental and Engineering Properties of Rock, Soil, and Aggregate, Transportation Research Record 1345, TRB, NRC, National Academy Press, Washington, DC, 74-83.
- 1 Shackelford, C.D. (1989). "Diffusion of contaminants through waste containment barriers." Transportation Research Record 1219, *Geotechnical Engineering 1989*, TRB, NRC, National Academy Press, Washington, DC, 169-182.

PUBLICATIONS (continued)

Invited Conference Papers

- 12 Shackelford, C.D. (2008). "Selected issues affecting the use and performance of GCLs in waste containment applications." *Geosynthetics and Environment, Proceedings of the Geotechnical Engineering Conference of Torino (XXI Edition)*, M. Manassero, and A. Dominijanni, Eds., Politecnico di Torino, Torino, Italy, Nov. 27-28, 2007, Pàtron Editore, Bologna (CD-ROM; ISBN: 978-88-555-2953-2).
- 11 Shackelford, C.D. (2005). "Environmental issues in geotechnical engineering." *16th International Conference on Soil Mechanics and Geotechnical Engineering* Osaka, Japan, Sept. 12-16, 2005, Millpress, Rotterdam, The Netherlands, Vol. 1, 95-122.
- 10 Ogorzalek, A.S., Shackelford, C.D., and Benson, C.H. (2005). "Comparison of model predictions and field data for an alternative cover in a semiarid climate." *Symposium on Mines and the Environment*, Rouyn-Noranda, Quebec, Canada, May 15-18, 2005, Canadian Institute of Mining, Metallurgy and Petroleum (CIM), Suite 855, 3400 de Maisonneuve Blvd. W., Montreal, Quebec, Canada H3Z 3B8 (CD version only, 666-680).
- 9 Shackelford, C.D. and Malusis, M.A. (2002). "Clay membrane behavior and coupled solute diffusion." *Chemico-Mechanical Coupling in Clays: From Nano-Scale to Engineering Applications*, Caterina Di Maio, Tomasz Hueckel, and Benjamin Loret, Eds., Maratea, Italy, June 28-30, 2001, Swets & Zeitlinger B. V., Lisse, The Netherlands, 289-297.
- 8 Shackelford, C.D. and Jefferis, S.A. (2000). "Geoenvironmental engineering for in situ remediation." *International Conference on Geotechnical and Geoenvironmental Engineering (GeoEng2000)*, Melbourne, Australia, Nov. 19-24, Technomic Publ. Co., Inc., Lancaster, PA, Vol. 1, 121-185.
- 7 Shackelford, C.D. (1999). "Remediation of contaminated land: An overview." *Proceedings, XI Pan-American Conference on Soil Mechanics and Geotechnical Engineering*, Iguasu Falls, Brazil, Aug. 8-13, 1999, Vol. 4, 371-430.
- 6 Shackelford, C.D. (1999). "Reactive nature of passive containment barriers." Discussion Session 6.1, *Proceedings, 14th International Conference on Soil Mechanics and Foundation Engineering*, Hamburg, Germany, Sept. 6-12, 1997, Balkema, Rotterdam, Vol. 4, 2535-2536.
- 5 Shackelford, C.D. (1997). "Modeling and analysis in environmental geotechnics: An overview of practical applications." *2nd International Congress on Environmental Geotechnics, IS-Osaka '96*, M. Kamon, ed., Osaka, Japan, Nov. 5-8, 1996, Balkema, Rotterdam, Vol. 3, 1375-1404.
- 4 Shackelford, C.D. and Nelson, J.D. (1996). "Geoenvironmental design considerations for tailings dams." *Proceedings, International Symposium on Seismic and Environmental Aspects of Dams Design: Earth, Concrete and Tailings Dams*, Santiago, Chile, Oct. 14-18, Sociedad Chilena de Geotecnia, Vol. I. 131-187.
- 3 Shackelford, C.D. (1994). "Contamination and decontamination of subsoil." *Geotechnical Aspects in the Design and Control of Waste Containment Systems*, Proceedings of the Geotechnical Engineering Meeting of the Italian Geotechnical Society, Milazzo, Sicily, April 13-15, 1994, 149-167.
- 2 Daniel, D.E. and Shackelford, C.D. (1987). "Containment of landfill leachate with clay liners." *Proceedings, International Symposium on Process Technology and Environmental Impact of Sanitary Landfills*, Cagliari, Sardinia, October 19-23, 1987, Vol. II, XXVII-1 - XXVII-24.
- 1 Daniel, D.E. and Shackelford, C.D. (1987). "Disposal barriers that release contaminants only by molecular diffusion." *Proceedings, 1987 Oak Ridge Model Conference*, Oak Ridge National Laboratory, Oak Ridge, TN, Waste Management, I(3), 315-332.

PUBLICATIONS (continued)

Refereed Conference Papers

- 21 Moore, S.M. and Shackelford, C.D. (2011). "Uranium diffusion in soils and rocks." *Tailings and Mine Waste '11, Proceedings of the 15th International Conference on Tailings and Mine Waste*, Vancouver, B.C., November 6-9, 2011, Norman B. Keevil Institute of Mining Engineering, University of British Columbia, Vancouver, BC, Canada, 549-561 (<https://circle.ubc.ca/handle/2429/38036>).
- 20 Hemsli, P.S., Shackelford, C.D., and Figueroa, L.A. (2006). "Modeling bioremediation of acid mine drainage using permeable reactive barriers." *5th International Congress on Environmental Geotechnics*, H. R. Thomas, Ed., Cardiff, Wales, June 26-30, 2006, Thomas Telford Ltd., London, Vol. II, 901-908.
- 19 Shackelford, C.D., Malusis, M.A., and Olsen, H.W. (2003). "Clay membrane behavior for geoenvironmental containment." *Soil and Rock America Conference 2003* (Proceedings of the joint *12th Panamerican Conference on Soil Mechanics and Geotechnical Engineering* and the *39th U. S. Rock Mechanics Symposium*), P. J. Culligan, H.H. Einstein, and A.J. Whittle, Eds., Verlag Glückauf GMBH, Essen, Germany, Vol. 1, 767-774.
- 18 Hemsli, P.S., Boscov, M.E.G., and Shackelford, C.D. (2002). "Points of zero charge and adsorption for a Brazilian residual soil." *4th International Congress on Environmental Geotechnics*, L. G. de Mello and M. Almeida, Eds., Rio de Janeiro, Brazil, August 11-15, 2002, Balkema (Swets & Zeitlinger B. V.), Lisse, The Netherlands, Vol. 1, 105-111.
- 17 Wildeman, T.R., Macalady, D.L., Shackelford, C.D., and Woods, S.L. (2002). "The EPA Rocky Mountain Regional Hazardous Substance Research Center." *Proceedings, 19th Annual Meeting of American Society for Mining Reclamation*, Lexington, KY, June 9-13, 2002, American Society of Mining Reclamation, 3134 Montavista Rd., Lexington, KY 40502, 979-992.
- 16 Malusis, M.A. and Shackelford, C.D. (2001). "Modeling contaminant transport through clay membrane barriers." *Proceedings, 2001 International Containment and Remediation Technology Conference and Exhibition*, Orlando, FL, June 10-13, Florida State University, Tallahassee (www.containment.fsu.edu/cd/DoubleClickToStart.htm), 146-149.
- 15 Malusis, M.A., Shackelford, C.D., and Olsen, H.W. (2001). "Flow and transport through clay membrane barriers." *Geoenvironmental Engineering, Geoenvironmental Impact Management*, R.N. Yong and H.R. Thomas, Eds., Thomas Telford Publ., London, UK, 334-341.
- 14 Troncoso, J.C. and Shackelford, C.D. (1999). "Solute transport in unsaturated soil beneath two abandoned evaporation ponds: II. Uranium infiltration simulations." *Proceedings, XI Pan-American Conference on Soil Mechanics and Geotechnical Engineering*, Iguasu Falls, Brazil, Aug. 8-13, 517-523.
- 13 Shackelford, C.D. (1998). "Educational programs in environmental geotechnics/ geoenvironmental engineering at USUCGER universities." *3rd International Congress on Environmental Geotechnics*, P. Seco e Pinto, Ed., Lisboa, Portugal, Sept. 7-11, 1998, Balkema, Rotterdam, Vol. 4, 1343-1351.
- 12 Majeski, M.J. and Shackelford, C.D. (1997). "Evaluating alternative water content - dry unit weight criteria for compacted clay liners." *Proceedings, International Symposium on Engineering Geology and the Environment*, Athens, Greece, June 23-27, 1997, Balkema, Rotterdam, 1989-1995.
- 11 Malusis, M.A. and Shackelford, C.D. (1997). "Modeling biodegradation of organic pollutants during transport through permeable reactive bio-walls." *Proceedings, 1997 International Containment Technology Conference and Exhibition*, St. Petersburg, Florida, Feb. 9-12, 1997, 937-944.
- 10 Shackelford, C.D. and Chiu, T.-F. (1997). "The influence of the capillary barrier effect on the use of sand underdrains in waste disposal practice." *Geoenvironmental Engineering, Contaminated Ground: Fate of Pollutants and Remediation*, R.N. Yong and H.R. Thomas, Eds., University of Wales, Cardiff, UK, Sept. 16-18, Thomas Telford Publ., London, UK, 357-364.

PUBLICATIONS (continued)

Refereed Conference Papers (continued)

- 9 Howell, J.L. and Shackelford, C.D. (1997). "Hydraulic conductivity of sand admixed with processed clay mixtures." *Proceedings, 14th International Conference on Soil Mechanics and Foundation Engineering*, Hamburg, Germany, Sept. 6-12, 1997, Balkema, Rotterdam, Vol. 1, 307-310.
- 8 Shackelford, C.D., Cotten, T.E., Davis, M.M., Strauss, S.H., and Rohal, K.M. (1997). "Characterizing zinc migration through a high pH sand-clay mixture." *XIV International Conference on Soil Mechanics and Foundation Engineering*, Hamburg, Germany, Sept. 6-12, 1997, Balkema, Rotterdam, Vol. 3, 1935-1938.
- 7 Malusis, M.A., Adams, J., Reardon, K.F., Shackelford, C.D., Mosteller, D.C., and Bourquin, A.W. (1997). "Microbial transport in a pilot-scale biological treatment zone." *Proceedings, 4th International Symposium on In Situ and On-Site Bioremediation*, New Orleans, Louisiana, April 28-May 1, 1997, Vol. 4, 559-564.
- 6 Manassero, M., Sani, D., Pasqualini, E., and Shackelford, C.D. (1996). "Diffusion and sorption parameters of a natural clay and a processed kaolin." *2nd International Congress on Environmental Geotechnics, IS-Osaka '96*, Osaka, Japan, Nov. 5-8, 1996, Balkema, Rotterdam, Vol. 1, 269-274.
- 5 Verga, F., Shackelford, C.D., and Verga, G. (1996). "Compatibility tests performed according to the constant hydraulic flux method and constant differential pressure method." *Proceedings, 1st International Conference, The Impact of Industry on Groundwater Resources*, Cernobbio, Como, Italy, May 22-24, 1996, *Sezione It. Acque Sotterranee dell'Associazione Georisorse e Ambiente*, Torino, Italy, 263-273.
- 4 Manassero, M. and Shackelford, C.D. (1994). "Classification of industrial wastes for re-use and landfilling." *First International Congress on Environmental Geotechnics*, July 10-15, 1994, Edmonton, Alberta, Canada, Bi-Tech, Richmond, B.C., 103-114.
- 3 Shackelford, C.D., Chang, C.-K., and Chiu, T.-F. (1994). "The capillary barrier effect in unsaturated flow through soil barriers." *First International Congress on Environmental Geotechnics*, July 10-15, 1994, Edmonton, Alberta, Canada, Bi-Tech, Richmond, B.C., 789-793.
- 2 Shackelford, C.D. (1992). "Performance-based design of soil liners." *Proceedings, Mediterranean Conference on Environmental Geotechnology*, Cesme, Turkey, May 25-27, Balkema, Rotterdam, 145-153.
- 1 Daniel, D.E., Shackelford, C. D., and Liao, W.P. (1988). "Transport of inorganic compounds through compacted clay soil." *Proceedings, 14th Annual Research Symposium on Land Disposal, Remedial Action, Incineration, and Treatment of Hazardous Waste*, US EPA, Cincinnati, OH (EPA-600-9-88-021), July, 114-125.

Non-Refereed Papers

- 9 Evans, J.C., Shackelford, C.D., Yeo, S.-S., and Henning, J., (2005). "Membrane behavior of soil-bentonite slurry trench cutoff walls." *Proceedings of the International Conference on Energy, Environment and Disasters (INCEED 2005)*, Charlotte, NC, July 24-30, 2005.
- 8 Benson, C.H., Bohnhoff, G.L., Apinwantragoon, P., Ogorzalek, A.S., Shackelford, C.D., and Albright, W.H. (2004). "Comparison of model predictions and field data for an ET cover." *Tailings and Mine Waste '04*, Balkema, Leiden, The Netherlands, 137-142.
- 7 Shackelford, C.D., Woods, S.L., and Macalady, D L. (2002). "Remediation of mine waste sites through the Rocky Mountain Regional Hazardous Substance Research Center (RMRHSRC)." *Tailings and Mine Waste '02*, Swets & Zeitlinger, Lisse, The Netherlands, 3-7.
- 6 Wildeman, T.R. and Shackelford, C.D. (2002). "Mining and the environment: The issues that steer the Region 8 Hazardous Substance Research Center." *Tailings and Mine Waste '02*, Swets & Zeitlinger, Lisse, The Netherlands, 9-11.

PUBLICATIONS (continued)

Non-Refereed Papers (continued)

- 5 Shackelford, C.D. and Rowe, R.K. (1998). "Contaminant transport modeling." *3rd International Congress on Environmental Geotechnics*, P. Seco e Pinto, Ed., Lisboa, Portugal, Sept. 7-11, 1998, Balkema, Rotterdam, Vol. 3, 939-956.
- 4 Marinelli, F., Erickson, T.A., Shackelford, C.D., Sealy, C.O., and Moore, J.C. (1998). "Ground water flow and chemical transport at a sodium sulfate disposal facility site, Owens Lake, California." *Proceedings, Conference on Tailings and Mine Waste '98*, Colorado State University, Fort Collins, January 26-28, Balkema, Rotterdam, 443-452.
- 3 Chiu, T.-F. and Shackelford, C.D. (1994). "Practical aspects of the capillary barrier effect for landfills." *Proceedings, 17th International Madison Waste Conference, University of Wisconsin*, Madison, September 21-22, 357-375.
- 2 Shackelford, C.D. (1994). "Report of Technical Committee on Environmental Control (TC5)." *First International Congress on Environmental Geotechnics*, Edmonton, Alberta, Canada, July 10-15, 1994, Bi-Tech Publ. Inc., Richmond, B.C., 981-1005.
- 1 Shackelford, C.D. (1994). "Hydrogeotechnics of clay liners for waste disposal." *Proceedings, Conference on Tailings and Mine Waste '94*, Colorado State University, Fort Collins, January 19-21, Balkema, Rotterdam, 9-22.

Articles in Archival Professional Magazines

- 4 Shackelford, C.D. and Sale, T.C. (2011). "Using the ZVI-clay technology for source zone remediation." *Geo-Strata*, ASCE, Reston, VA, 15(2), 36-42.
- 3 Shackelford, C.D., Malusis, M.A., and Olsen, H.W. (2001). "Clay membrane barriers for waste containment." *Geotechnical News*, Bi-Tech Publishers, Vancouver, B.C., 19(2), 39-43.
- 2 Shackelford, C.D. (1989). "Limitations of contaminant transport modeling in waste Geotechnics." *Geotechnical News*, Bi-Tech Publishers, Vancouver, B.C., 7(2), 50-53.
- 1 Shackelford, C.D. (1988). "Diffusion as a transport process in fine-grained barrier materials." *Geotechnical News*, Bi-Tech Publishers, Vancouver, B.C., 6(2), 24-27.

Books

- 1 Mitchell, J.K., Alvarez-Cohen, L., Atekwana, E.S., Burns, S.E., Gilbert, R.B., Kavazanjian, Jr., E., O'Riordan, W.H., Rowe, R.K., Shackelford, C.D., Sharma, H.D., and Yesiller, N. (2007). *Assessment of the Performance of Engineered Waste Containment Barriers*. The National Academies Press, 500 Fifth Street, N.W., Washington, DC 20001.

Book Chapters

- 6 Yesiller, N. and Shackelford, C.D. (2011). Geoenvironmental Engineering (Chapter 13). *Geotechnical Engineering Handbook*, Das, B.M., Ed., J. Ross Publishing, Ft. Lauderdale, FL, 13-1 – 13-61.
- 5 Sleep, B.E., Shackelford, C.D., and Parker, J.C. (2006). Modeling of fluid transport through barriers (Chapter 2). *Barrier Systems for Environmental Contaminant Containment and Treatment*, C.C. Chien, H.I. Inyang, and L.G. Everett, Eds., CRC Press, Taylor and Francis Group, LLC, Boca Raton, FL, 71-141.
- 4 Shackelford, C.D. (2002). Geoenvironmental Engineering. *Encyclopedia of Physical Science and Technology, Third Edition*, Academic Press, San Diego, Vol. 6, 601-621.
- 3 Rabideau, A.J., Andrews, C.B., Chiang, C., Grathwohl, P., Hayworth, J.S., Culligan-Hensley, P., Manassero, M., Mercer, J.W., Mott, H., Schroeder, P.R., Shackelford, C.D., Teutsch, G., van Meurs, G.A.M., Wilhem, R., and Zheng, C. (1996). Contaminant transport modeling (Section 10). *Assessment of Barrier Containment Technologies*, R. R. Rumer and J. K. Mitchell, Eds., National Technical Information Service, Springfield, Virginia, 247- 299.

PUBLICATIONS (continued)

Book Chapters (continued)

- 2 Shackelford, C.D. (1993). Contaminant transport (Chapter 3). *Geotechnical Practice for Waste Disposal*, D.E. Daniel, Ed. Chapman and Hall, London, 33-65.
- 1 Daniel, D.E. and Shackelford, C.D. (1989). Containment of landfill leachate with clay liners (Chapter 5.3). *Sanitary Landfilling: Process, Technology, and Environmental Impact*, T.H. Christensen, R. Cossu, and R. Stegmann, Eds., Academic Press, London, 323-341.

Discussions/Closures

- 2 In: *ASCE Journal of Geotechnical Engineering*, January, 1996, 122(1):84-85. Closure for discussion by Barry and Anderson on: Critical concepts for column testing.
- 1 In: *Journal of Ground Water*, May-June, 1989, 27(3):408-409. Discussion on: Infiltration and hydraulic conductivity of a compacted earthen liner, by K.A. Albrecht and K. Cartwright, *Journal of Ground Water*, Jan.-Feb., 1989.

Book Forwards

- 1 Lu, N. and Likos, W.J. (2004). *Unsaturated Soil Mechanics*. John Wiley and Sons, Inc., Hoboken, NJ, xvii-xviii.

Editor (Books and Special Journal Issues)

- 4 *Coal and Fly Ash: Characterization and Utilization*, C.D. Shackelford, ed., Special Issue of *Journal of Hazardous Materials*, Elsevier, Vol. 76, Nos. 2-3, Sept. 15, 2000.
- 3 *Advances in Unsaturated Geotechnics*, C.D. Shackelford, S. L. Houston, and N.-Y. Chang, eds., held in Denver, Colorado, Aug. 5-7, 2000, ASCE, Reston, VA, 2000.
- 2 *Uncertainty in the Geologic Environment: From Theory to Practice*, Geotechnical Special Publication No. 58, C.D. Shackelford, P. P. Nelson, and M. J. S. Roth, eds. held in Madison, Wisconsin, July 31 - Aug. 2, 1996, ASCE, Reston, VA, 1996.
- 1 *Proceedings, US - Scandinavian Workshop on Geotechnical Research Collaboration*, Edited by K. G. Senneset, C.D. Shackelford, and J.M. Strout, Norwegian Institute of Technology, Trondheim, Norway, June 8-10, 1994.

Abstracts

- 4 Shackelford, C.D. and Malusis, M.A. (2002). "Steady-state solute diffusion through a semi-permeable clay membrane." *39th Annual Clay Minerals Society Meeting: Boulder Clays*, Boulder, CO, June 8-13, 2002.
- 3 Shackelford, C.D., Malusis, M.A., and Olsen, H.W. (2001). "Clay membrane barriers for geoenvironmental containment applications." *38th Annual Clay Minerals Society Meeting*, Madison, WI, June 16-20, 2001.
- 2 Shackelford, C.D. (1993). "Measurement of solute breakthrough curves through processed kaolin at low flow rates." *30th Annual Clay Minerals Society Meeting*, San Diego, CA, Sept. 25-30, Dept. of Geological Sciences, San Diego State University, San Diego.
- 1 Shackelford, C.D. (1989). "Laboratory diffusion testing for waste disposal." *26th Annual Clay Minerals Society Meeting*, Sacramento, CA, Sept. 25-28, Dept. of Civil Engineering, California State University, Sacramento.

General Articles

- 1 Breaking New Ground in the Geotech Program. *Engineering Review*, CSU, Jan., 1990, 3(1), 18.

PUBLICATIONS (continued)

Professional Reports

- 15 Shackelford, C. D. and Lee, J.-M. (2002). Final Report on: *Large-scale hydraulic conductivity testing results for block samples from Rocky Mountain Arsenal (RMA) enhanced hazardous waste landfill test pads*, Foster Wheeler Environmental Corporation, 72nd Avenue at Quebec Street, Commerce City, CO 80022-1748 (February 6).
- 14 Shackelford, C. D. (2001). Final Report on: *Potential effect of revised process water/leachate characteristics on hydraulic conductivity of GCLs used for base liner at the tailings management area for the proposed Nicolet Mining Company's zinc/copper mine located near Crandon, Wisconsin*, Foth & Van Dyke and Associates, Inc., 2737 S. Ridge Road, P.O. Box 19012, Green Bay, WI 54307-9012 (November 23).
- 13 Shackelford, C. D. and Lee, J.-M. (2000). Final Report on: *Large-scale hydraulic conductivity testing of conglomerate bedrock samples*, Hollingsworth Assoc., Inc., 2895 W. Oxford Ave., Suite 4, Sheridan, CO 80110 (December 15).
- 12 Hill, T. H. and Shackelford, C. D. (2000). Final Report on: *Large-scale hydraulic conductivity testing, High Savery Dam project, Wyoming, USA*, Hollingsworth Assoc., Inc., 2895 W. Oxford Ave., Suite 4, Sheridan, CO 80110, (April 13).
- 11 Shackelford, C. D. (1999). Final Report on: *Testing of two soils for evaporation ponds, Tuba City, Arizona*, MACTEC-ERS, 2592 B3/4 Rd., Grand Junction, CO 81503.
- 10 Shackelford, C. D. (1998). Final Report on: *GCL compatibility testing for base liner at the tailings management area for the proposed Nicolet Minerals Company zinc/copper mine near Crandon, Wisconsin*, Foth & Van Dyke and Assoc., Inc., 2737 South Ridge Road, P. O. Box 19012, Green Bay, WI 54307-9012.
- 9 Shackelford, C. D. and Rowe, R. K. (1997). Contaminant transport modeling, Chapter 2 (SC2), *Report of the ISSMFE Technical Committee TC 5 on Environmental Geotechnics*, 1st (Draft) Edition, Ruhr-Universität Bochum, Germany, September, 5-22.
- 8 Shackelford, C. D. (1997). Final Report on: *Design and construction recommendations for proposed evaporation ponds at Luck Mc uranium tailings site*, Pathfinder Mines Corp., 935 Pendell Boulevard, P. O. Box 730, Mills, WY 82644.
- 7 Shackelford, C. D., Chiu, T.-F., and Malusis, M. A. (1995). Final Report on: *A capillary barrier cover system for the alternative landfill cover demonstration at Sandia National Laboratory*, Sandia National Laboratories, Environmental Restoration Technologies, Department 6621, Albuquerque, NM 87185.
- 6 Shackelford, C. D. and Malusis, M. (1994). Final Report on: *Use of Floridin clay products for stabilization applications (Phase I)*, Floridin Company, 1101 N. Madison St., Quincy, FL 32351.
- 5 Shackelford, C. D. (1992). Final Report on: *An evaluation of the leachability of heavy metals from fly ash liner materials*, National Science Foundation, Washington, DC.
- 4 Shackelford, C. D. (1992). *Macro-engineering concept for remediation of the Hanford Facility*, Hanford, Washington, A.T. Kearney, Richland, WA.
- 3 Shackelford, C. D. (1991). *Technical evaluation of the geotechnical report for the permit application for the Otero County Regional Landfill expansion*, US Air Force, Holloman AFB, NM.
- 2 Shackelford, C. D. (1990). Progress Report on: *An evaluation of the leachability of heavy metals from fly ash liner materials*, National Science Foundation, Washington, DC.
- 1 Daniel, D. E., Shackelford, C. D., Liao, W. P., and Liljestrand, H. M. (1989). *Rate of flow of leachate through clay soil liners*. US EPA, Cincinnati, OH.

RESEARCH

Research Interests

- Diffusion of Contaminants in Soils
- Flow and Contaminant Transport through Saturated and Unsaturated Porous Media
- Geoenvironmental Engineering
- Membrane Behavior of Clays and Coupled Flow Processes
- Permeability and Compatibility of Fine-Grained Soils
- Physico-Chemical Properties of Soils
- *In Situ* Remediation Technologies
- Soil and Waste Stabilization

Funded Research – Principal Investigator

No.	Project Title	Sponsor	Amount	Period
32	<i>Instrumentation and Equipment for Experimental Research on Flow and Contaminant Transport through Engineered Soil Barriers</i>	Dept. of Civil and Environmental Engineering, CSU	\$18,900	10/6/11
31	<i>Critical Assessment of Radionuclide Transport through Engineered Barrier Systems for Long-Term Containment</i>	DOE via Vanderbilt and the University of Wisconsin-Madison	\$15,054	09/30/11 – 01/31/12
30	<i>Water De-Aeration System and Vacuum Supply and Filter Presses in Support of Experimental Research on Flow and Contaminant Transport through Engineered Soil Barriers</i>	Dept. of Civil and Environmental Engineering, CSU	\$10,300	11/08/10
29	<i>Critical Assessment of Radionuclide Transport through Engineered Barrier Systems for Long-Term Containment</i>	DOE via Vanderbilt and the University of Wisconsin-Madison	\$103,187	10/01/10 – 09/29/11
28	<i>Experimental and Computational Investigations for Consolidation-Induced Contaminant Transport for High Water Content Geo-Materials</i>	NSF	\$210,000	07/01/10 – 06/30/13
27	<i>Laboratory Apparatuses for Measuring Hydraulic Behavior of Bentonite Polymer Nanocomposites</i>	Dept. of Civil and Environmental Engineering, CSU	\$8,280	11/10/09
26	<i>Critical Assessment of Coupled Flow Behavior in Unsaturated Clay Barriers</i>	NSF	\$228,258	09/15/09 – 08/31/12
25	<i>Laboratory Apparatus for Measuring Membrane Behavior of Clay Soils</i>	Dept. of Civil and Environmental Engineering, CSU	\$11,736	11/09/08

RESEARCH (continued)

Funded Research – Principal Investigator (continued)

No.	Project Title	Sponsor	Amount	Period
24	<i>Bentonite-Polymer Nanocomposites for the Geoenvironment</i>	NSF	\$221,397	08/01/08 – 07/31/11
23	<i>Enhanced Clay Membrane Barriers for Sustainable Waste Containment</i>	NSF	\$198,648	10/01/06 – 09/30/10
22 ¹	<i>Evaluation of Hydrologic Models for Alternative Covers at Mine Waste Sites</i>	EPA	\$236,163	11/01/02 – 10/31/06
21	<i>Rocky Mountain Regional Hazardous Substance Research Center</i>	EPA	\$3,750,000	11/01/01– 10/31/06
20	<i>Membrane Behavior of Clay Soil Barrier Materials</i>	NSF	\$229,681	08/01/01 – 07/31/06
19	<i>Assessing the Use of Geosynthetic Clay Liners (GCLs) for Animal Waste Containment Lagoons</i>	AES (USDA), CSU	\$148,000	07/01/01– 06/30/04
18	<i>Long-Term Performance of GCLs Permeated with Aqueous Inorganic Solutions</i>	NSF	\$170,412	08/15/99 – 06/30/03
17	<i>Evaluation of Clay Liners at Uranium Mill Sites</i>	UMETCO, Grand Junction, CO	\$10,000	03/05/98 – 05/31/99
16	<i>Contaminant Transport by Diffusion in Partially Saturated Soils</i>	UMETCO, Grand Junction, CO	\$10,000	08/22/97 – 05/31/99
15	<i>Coupled Solute Migration through Clay Barrier Materials</i>	NSF	\$136,667	09/15/96 – 08/31/99
14	<i>Research Experience for Undergraduates</i>	NSF	\$5,000	05/15/96 – 08/15/96
13	<i>Microbial Transport in Soils</i>	Camp Dresser & McKee, Denver	\$12,500	05/17/96 – 05/01/97
12	<i>Equipment for Flow and Transport Testing</i>	Trautwein Soil Testing Equipment Co., Houston	\$26,170	1995

¹ Project 22 funded by the *Rocky Mountain Regional Hazardous Substance Research Center* (Project 21), so funded amount not included in total funding as PI.

RESEARCH (continued)**Funded Research – Principal Investigator (continued)**

No.	Project Title	Sponsor	Amount	Period
11	<i>Alternative Landfill Cover Demonstration</i>	Sandia National Laboratories (DOE)	\$73,929	01/10/95 – 09/30/95
10	<i>U. S. - Scandinavian Workshop on Geotechnical Research Collaboration</i>	NSF	\$40,073	04/15/94 – 03/31/96
9	<i>Column and Diffusion Studies</i>	Ingegneria Geotecnica srl, Torino, Italy	\$11,300	04/07/94 – 06/30/95
8	<i>Use of Floridin Clay Products for Stabilization and Compatibility (Environmental) Applications</i>	Floridin Co., Quincy, FL	\$25,013	04/30/93 – 04/29/94
7	<i>Research Experience for Undergraduates</i>	NSF	\$4,250	05/15/93 – 08/15/93
6	<i>Equipment for Flow and Transport Testing</i>	Trautwein Soil Testing Equipment Co., Houston	\$13,655	1992
5	<i>A Comparison of Steady-State and Transient Methods for Measuring Effective Diffusion Coefficients for Waste Disposal</i>	NSF	\$106,340	10/01/92 – 09/30/96
4	<i>National Young Investigator Award</i>	NSF	\$232,470	10/01/92 – 04/30/97
3	<i>Recycled Diatomaceous Earth for Waste Containment</i>	Graduate School-CSU Faculty Research Grant	\$3,500	01/01/92 – 12/31/92
2	<i>Research Experience for Undergraduates</i>	NSF	\$4,150	05/15/91 – 08/15/91
1	<i>An Evaluation of the Leachability of Heavy Metals from Fly Ash Liner Material</i>	NSF	\$60,000	09/01/89 – 08/31/92
Total =			\$6,098,870	

RESEARCH (continued)

Funded Research – Co-Principal Investigator

No.	Project Title	Sponsor	Amount	Period
5	<i>Development and Commercialization of Dupont's Method for Remediating Contaminated Soils</i>	DuPont	\$300,000	10/01/03 – 09/30/07
4 ¹	<i>Reactive Transport Modeling of Metal Removal from Anaerobic Biozones</i>	EPA	\$201,341	11/01/03 – 10/31/05
3	<i>Lumped Chemical Approach for Fate and Transport Modeling of Organic Pollutant Mixtures</i>	EPA	\$721,695	10/01/01 – 01/31/06
2	<i>Bioremediation in the Engineering Curriculum: A Module-Based Approach</i>	NSF	\$350,000	09/15/95 – 08/31/98
1	<i>Affiliation Program in Water Resources and Environmental Engineering</i>	United States Information Agency	\$98,820	09/01/93 – 08/31/97
			Total =	\$1,470,515

Funded Research – Research Team Member

No.	Project Title	Sponsor	Amount	Period
1	<i>Methodologies for Design of Soil Covers of Waste Disposal Sites</i>	Nuclear Regulatory Commission	\$330,000	09/01 – 01/94
			Total =	\$330,000

¹ Project 4 funded by the *Rocky Mountain Regional Hazardous Substance Research Center* (Project 21 under PI funding), so funded amount not included in total funding as Co-PI

ADVISING

Graduate Studies: Advisor, Ph D

No.	Name*	Dissertation Title (T = tentative)	Graduation Date
12	Kristin M. Sample	<i>Membrane Behavior of Unsaturated Clay (T)</i>	May 2013
11	Catherine SooJung Hong	<i>Enhanced Sorption Capacity of Soil-Bentonite Cutoff Walls Via Zeolite Amendment for Sustainable Waste Containment (T)</i>	Dec. 2012
10	Gretchen L. Bohnhoff	<i>Membrane Behavior, Diffusion, and Compatibility of a Bentonite-Polymer Nanocomposite (T)</i>	Aug. 2012
9	Jong-Beom Kang	<i>Membrane Behavior of Clay Liner Materials</i>	Dec. 2008
8	Jin-Chul Joo	<i>Lumped Approach for Sorption of Organic Compound Mixtures to Simulated Aquifer Sorbents</i>	Dec. 2007
7	Paulo S. Hemsí	<i>Computational Modeling of Bioremediation of Acid Mine Drainage in Biochemical Permeable Reactive Barriers</i>	Dec. 2005
6	Jae-Myung Lee	<i>Long-Term Hydraulic Performance of Geosynthetic Clay Liners Subjected to Inorganic Salt Solutions</i>	May 2004
5	Michael A. Malusis	<i>Membrane Behavior and Coupled Solute Transport through a Geosynthetic Clay Liner</i>	Aug. 2001
4	Ingdean Yan	<i>HCET: A Finite Element Model for Solute Transport Driven by Hydraulic, Chemical, Electrical, and Thermal Gradients</i>	Dec. 2000
3	Nabil H. Amer	<i>Influence of the Gradient Application Condition on Laboratory Measurement of the Hydraulic Conductivity of a Sand-Bentonite Mixture</i>	Dec. 1997
2	Te-Fu Chiu	<i>Capillary Barrier Effect for Constant Head Boundary Condition at High Initial Degree of Saturation</i>	May 1997
1	Farhat Javed	<i>Time and Scale Effects In Laboratory Permeability Testing of Compacted Clay Soil</i>	Dec. 1989

* Includes current students who have passed PhD qualifying exam.

ADVISING (continued)**Graduate Studies: Advisor, MS-Thesis Option**

No.	Name	Thesis Title (T = tentative)	Graduation Date
24	Stephanie M. Moore	<i>Diffusion of Radionuclides through Soils, Rocks, and Containment Barrier Materials (T)</i>	Aug. 2012
23	Gustavo Vianna	<i>Consolidation Behavior of Mixtures of Sand, Bentonite, and Zero-Valent Iron in Large-Scale Columns</i>	May 2009
22	Kristin M. Sample	<i>One-Dimensional Consolidation of Bentonite-Zero Valent Iron Slurry Mixed Sand</i>	Dec. 2007
21	David Castelbaum	<i>Laboratory Simulation of In Situ Soil Mixing for Remediation with Zero-Valent Iron and Bentonite Slurry</i>	Dec. 2007
20	Aaron S. Ogorzalek	<i>Evaluation of Hydrologic Models for Alternative Soil Covers</i>	Dec. 2005
19	L. Clint Brown	<i>Hydraulic Performance and Solute Migration through a Geosynthetic Clay Liner for Anaerobic Waste Lagoons</i>	May 2004
18	Sang-Sik Yeo	<i>Hydraulic Conductivity, Consolidation, and Membrane Behavior of Model Backfill-Slurry Mixtures for Vertical Cutoff Walls</i>	Dec. 2003
17	Leonard (Toby) M. Wright	<i>Characterization of Permeant Fluid Compatibility and Leachability of Metals of Fly Ash and Fly Ash-Soil Mixtures</i>	May 2000
16	Craig A. Burger	<i>Moisture Characteristics of Diatomaceous Earth and Sand-Diatomaceous Earth Mixtures</i>	Dec. 1999
15	Jorge C. Troncoso	<i>Uranium Transport in Unsaturated Soil Beneath Two Evaporation Ponds</i>	Aug. 1999
14	Mitchell J. Majeski	<i>Hydraulic Conductivity of GCLs Permeated with Calcium Chloride Solutions</i>	May 1999
13	N. John Bingham	<i>Hydraulic Conductivity of Sand-Bentonite Mixtures using Double-Ring Rigid-Wall Permeameters</i>	Aug. 1997
12	Martin L. Skyрман	<i>Adsorption of Zinc, Lead, and Cadmium with Kaolinite and Bentonite Using Batch-Equilibrium Methods</i>	May 1997

ADVISING (continued)**Graduate Studies: Advisor, MS-Thesis Option (continued)**

No.	Name	Thesis Title (T = tentative)	Date
11	Roslyn T. Stern	<i>Hydraulic Conductivity of Sand Admixed with Processed Clay Mixtures Permeated with Calcium Chloride Solutions</i>	May 1997
10	Melanie M. Davis	<i>Zinc Chloride Diffusion in Confined Specimens of a Sand-Attapulgite Clay Mixture</i>	Dec. 1996
9	Jennifer L. Howell	<i>Hydraulic Conductivity Testing of Sand Mixed with Attapulgite, Bentonite, or Attapulgite/Bentonite</i>	Aug. 1996
8	Michael A. Malusis	<i>Stabilization of Metal Bearing Wastes Using Chain-Structured Clay Admixtures</i>	Aug. 1995
7	Todd E. Cotten	<i>Zinc Diffusion in Unconfined Soil Specimens of a High pH Soil</i>	May 1995
6	Chung-Kan Chang	<i>Evaluation of Moisture-Characteristic Functions for One-Dimensional Unsaturated Flow through Capillary Barriers</i>	May 1994
5	Tamar di Franco	<i>Horizontal Wells for Dewatering Thin Unconfined Aquifers</i>	Aug. 1993
4	Patrick L. Redmond	<i>Measurement of Solute Breakthrough Curves with the Flow - Pump Permeameter</i>	Aug. 1993
3	Abdalla El-Saka	<i>Permeability, Compatibility, and Leachate Quality of Recycled Diatomaceous Earth</i>	Dec. 1992
2	Michael J. Glade	<i>Influence of Cation Exchange Capacity on Metals Leaching from Soil Amended Fly Ash</i>	Dec. 1992
1	Daniel N. Creek	<i>Effect of Flow Rate on Leaching of Metals from Fly Ash and Stabilized Fly Ash</i>	May 1991

ADVISING (continued)

Graduate Studies: Advisor, MS-Report Option (continued)

No.	Name	Report Title	Date
4	Kristle V.P. Hawkins	<i>Analytical Transport Modeling using Microsoft Excel and Matlab</i>	Dec. 2011
3	Jeffrey G. Coleman	<i>Column Experiments to Evaluate the Effectiveness of Peat, Fly Ash and Iron Metal for Attenuating Uranium in Groundwater</i>	Dec. 2001
2	Steve Simpson	<i>Prediction of Hydraulic Conductivity of Coarse-Grained Soils Using the Kozeny-Carman Equation</i>	May 1990
1	Emmalee Blender	<i>Soil Stabilization and Improvement</i>	May 1989

Graduate Studies: Visiting Doctoral Student

- Francesca Verga (1995-96). Performed all of her laboratory work for her Ph.D. research under my supervision during this period as part of the requirements for her dissertation at the Politecnico di Torino in Italy.

Graduate Studies: External Evaluator or Committee Member– Ph D Dissertations

- "Limited Water Flow Through Unsaturated, Compacted Soils," by Joonyong Lee, Department of Department of Civil, Environmental, and Architectural Engineering, University of Colorado-Boulder, Boulder, CO 80309 (April 5, 2011)
- "Diffusive Transport of Volatile Organic Compounds through Geomembranes," by Rebecca Sheila Anne McWatters, Department of Civil Engineering, Queen's University, Kingston, Ontario, Canada K7L 3N6 (April 28, 2010).
- "The Waste and Low Grade Ore Stockpiles of Ranger Uranium Mine – A System Approach," by Gregory James Shirliff, Quaternary and Reogolith Studies, The Australian National University, Canberra, ACR 0200, Australia (July 2008).
- "Rehabilitation Studies on Tailings Storage Facilities in an Arid Hypersaline Region," by Daniel J. Stolberg, Division of Civil Engineering, School of Engineering, The University of Queensland, Brisbane, QLD 4072, Australia (Nov.-Dec. 2005).
- "Unsaturated Flow under Increased Gravitational Fields," by Eduardo Dell'Avanzi, Department of Civil, Environmental, and Architectural Engineering, University of Colorado-Boulder, Boulder, CO 80309 (Aug. 2004).
- "Evaluation and Analysis of Acid Sulphate Soils Impacts via Tidal Restoration," by William C. Glamore, Faculty of Engineering, University of Wollongong, NSW 2522, Australia (Feb. 2004).
- "Cation Exchange and Long-Term Hydraulic Conductivity of a Geosynthetic Clay Liner (GCL) Permeated with Inorganic Salt Solutions," by Ho Young Jo, Department of Geological Engineering, University of Wisconsin, Madison, WI 53706 (May 2003).
- "The Role of Unsaturated Soil Property Functions in the Practice of Unsaturated Soil Mechanics," by Murray Fredlund, Department of Civil Engineering, University of Saskatchewan, Saskatoon, Saskatchewan, Canada S7N 5A4 (March 7, 2000).
- "Modeling Water Flow in an Unsaturated Compacted Soil," by Katia Vanessa Bicalho, Department of Civil, Environmental, and Architectural Engineering, University of Colorado-Boulder, Boulder, CO 80309 (Aug. 1999).

ADVISING (continued)

Graduate Studies: External Evaluator or Committee Member– Ph D Dissertations (continued)

- "Transport of Contaminants in Vertical Barriers: Enhancement of Barrier Performance with Sorptive and Reactive Additives," by Ashutosh Khandewal, Department of Civil, Structural and Environmental Engineering, State University of New York at Buffalo, Buffalo, NY 14260 (Jan. 1999).
- "A Laboratory Method for Investigation of Diffusion and Transformation of Volatile Organic Compounds in Low Permeability Media," by Susan Lynee Gordon, Department of Earth Sciences, University of Waterloo, Waterloo, Ontario, Canada N2L 3G1 (Dec. 8, 1998).

Undergraduate Studies: NSF Research Experience for Undergraduates (REU)

- Description: Provides financial assistance in the form of a monthly stipend (~ \$1,100/mo) to undergraduate students for work performed on existing NSF funded projects supervised by PI during summer months (May 15-Aug. 15). Students supervised are as follows:
 - John Vasquez (Summer, 1996)
 - Roslyn Force (Summer, 1993)
 - Mary DiMartini (Summer, 1992)
 - Todd Cotten (Summer, 1992)
 - Jamie Reichler (Summer, 1991)

Undergraduate Studies: Senior Honors Thesis

- Mary E. Williams (March 26, 1990), "A Great Place to Meet Men (or Why Aren't More Women Studying Engineering?)".

Undergraduate Studies: Senior Design Project Advising

- "The Las Animas Landfill":
 - CE 469 - Design Practice I, Fall, 1996 (5 students)
 - CE 470 - Design Practice II, Spring, 1997 (5 students)
- "Contaminant Transport Modeling of the Larimer County Landfill":
 - CE 469 - Design Practice I, Fall, 1992 (6 students)
 - CE 470 - Design Practice II, Spring, 1993 (6 students)
- "Evaluation and Design of an Expansion of the Larimer County Landfill":
 - CE 469 - Design Practice I, Fall, 1989 (8 students)
 - CE 470 - Design Practice II, Spring, 1990 (7 students)

Undergraduate Studies: General Advising

- Curriculum Advising - from 8 to 16 students per semester.

UNIVERSITY ACTIVITIES AND SERVICE

University Committee Memberships/Participation

- Faculty Research Grants Committee, Graduate School (1998-99).
- Academic Standards Committee, Faculty Council (1994-1996).
- University Faculty Council (1990-1993).

College Committee Memberships/Participation

- *Ad hoc* Dean's Think Tank Committee (2007-present).
- *Ad hoc* search committee for CE Department Head (2000).
- College Curriculum Committee (1995-96).
- Faculty Focal Group, Visions Committee 2020 (1993).

Department Committee Memberships/Participation

- Departmental Executive Committee (since Jan. 2012).
- Graduate Applications Committee (since Jan. 2012).
- *Ad hoc* faculty search committee for Geoengineering (2011-12).
- *Ad hoc* faculty search committee for Structural I Engineering (2011-12).
- *Ad hoc* faculty search committee for Structural Engineering (2010).
- Internal Advisory Committee (2006-present).
- Strategic Planning Committee (2006-present).
- Departmental Tenure Committee (1997-2001; Chair: 2000-01; 2005-2010).
- Departmental Promotion Committee (1999-2004; Chair 2003-04; 2005-2010).
- Chair of *ad hoc* faculty search committee for Geotechnical Engineering (2003-04).
- Graduate Initiatives Committee (2003).
- *Ad hoc* Strategic Initiatives Committee (2003).
- Chair of *ad hoc* faculty search committee for Geotechnical Engineering (2002-03).
- Member of *ad hoc* committee for evaluation of internal equipment proposals (2003, 2004).
- *Ad hoc* faculty search committee for Environmental Engineering (2000-01).
- *Ad hoc* faculty search committee for Environmental Engineering (1997-98).
- *Ad hoc* faculty search committee for Structural Engineering (1997-98).
- Program Review Committee (1995-96).
- Awards Committee (1992-94; Chair 1994-95).
- Chi-Epsilon Faculty Advisor, Dept. of Civil Engineering (1991-93).
- Graduate Instruction Committee, Dept. of Civil Engineering (Member: 1988-91; Chairman: 1991-92; 1994).
- 5-Year Program (CE) Review Committee, College of Engineering (1989-90).
- Library Liaison, Dept. of Civil Engineering (1988-89).

PROFESSIONAL ACTIVITIES AND SERVICE

Editorial Services (Journals and Periodicals)

- Editorial Board Member, *Geotextiles and Geomembranes*, Elsevier Publ., Amsterdam, The Netherlands (Oct. 29, 2008 – Oct. 28, 2011).
- Editor, *Journal of Geotechnical and Geoenvironmental Engineering*, ASCE, Reston, VA (Oct. 1, 1999 – Dec. 31, 2003).
- Editor, *Journal of Hazardous Materials*, Elsevier Publ., Amsterdam, The Netherlands (Oct. 1, 1998 – Dec. 31, 2007).
- Editorial Board Member, *Journal of Geotechnical and Geoenvironmental Engineering*, ASCE, Reston, VA (Aug. 1, 1996 – Sept. 30, 1999).
- Co-Editor, "Environmental Geotechnics" section, *Geotechnical News* magazine, Bi-Tech Publishers, Ltd., Vancouver, British Columbia (June 1988 - June 1995).

Professional Society Memberships

- American Society of Civil Engineers (ASCE).
- American Society for Testing and Materials (ASTM).
- Canadian Geotechnical Society (CGS).
- Clay Minerals Society (CMS).
- International Geosynthetics Society (IGS).
- International Society for Soil Mechanics and Geotechnical Engineering (ISSMGE).

International Committee Memberships/Participation

- Executive Member, *Environmental Geotechnics Committee TC215*, International Society for Soil Mechanics and Geotechnical Engineering (2009-2013).
- Member, *Environmental Geotechnics Committee TC5*, International Society for Soil Mechanics and Geotechnical Engineering (2005-2009).
- Co-Chair, *Environmental Geotechnics Committee TC5*, International Society for Soil Mechanics and Geotechnical Engineering (2001-2005).
- Secretary, *Environmental Geotechnics Committee TC5*, International Society for Soil Mechanics and Geotechnical Engineering (1991-2001).

National Committee Memberships/Participation

- Member, *Committee to Assess the Performance of Engineered Barriers*, The National Academies, Division on Earth and Life Studies, Board on Earth Sciences and Resources, 500 Fifth Street, NW, Washington, DC 20001 (Aug. 2005-April 30, 2007).
- Chair, *ASCE Geo-Institute Awards Committee* (March 10, 2005-Sept. 30, 2007).
- Member, *ASCE Geo-Institute Awards Committee* (Oct. 1, 2002-March 10, 2005).
- Member, *Soil Properties and Modeling Committee*, ASCE Geo-Institute (since May 5, 1998).
- Member, TRB Committee A2L03, Committee on *Physicochemical Phenomena in Soils* (1994).
- Member, ASTM D 18.04 *Committee on Hydrologic Properties of Soil & Rock*, American Society for Testing & Materials (since Oct. 1998).
- Member, Geoenvironmental Engineering Committee (formerly *Environmental Geotechnics Committee*), ASCE Geo-Institute (continuous since Oct. 1, 1989).
- Secretary, Board of the *United States Universities' Council for Geotechnical Engineering Research (USUCGER)* (2001- May 2003).
- Member, Geo-Institute *Technical Coordination Council (TCC)* (Oct. 1, 2000-Sept. 30, 2002).
- Member, Board of the *United States Universities' Council for Geotechnical Engineering Research (USUCGER)* (1999-2001).
- Member, *Awards Committee*, ASCE Geo-Institute (Oct. 1998-Sept. 1999).

PROFESSIONAL ACTIVITIES AND SERVICE (continued)

National Committee Memberships/Participation (continued)

- Chair, *Environmental Geotechnics Committee*, ASCE Geo-Institute (Oct. 1, 1992-Sept. 30, 1996).
- Member, *Environmental Geotechnics Committee*, ASCE Geo-Institute (Oct. 1, 1988-Sept. 30, 1992).

State Committee Memberships/Participation

- Colorado Transportation Research Coordination Committee (1990).

Moderator and Session/Conference Organizer

- Member, Organizing Committee, conference on *Tailings and Mine Waste '12*, Oct. 14-17, 2012, Keystone Resort, Keystone, CO.
- Moderator, panel on "Prediction in Geoenvironmental Engineering: State-of-Practice and Needs for the Future" at the ASCE Geo-Institute's annual conference, *GeoFlorida – Advances in Analysis, Modeling & Design*, Feb. 20-24, 2010, West Palm Beach, FL.
- Session co-organizer for two sessions on "Mechanical and Chemical Soil Behavior" at the ASCE Geo-Institute's annual conference, *GeoCongress 08 – The Challenge of Sustainability in the Geoenvironment*, March 9-12, 2008, New Orleans, LA.
- Session co-organizer for session on "Chemical Compatibility Issues for Geosynthetic Clay Liners (GCLs)" to be held at *GeoAmericas 2008 – The First Pan American Geosynthetics Conference and Exhibition*, March 2-5, 2008, Cancun, Mexico.
- Member, International Advisory Committee for the *12th International Conference of the International Association for Computer Methods and Advances in Geomechanics*, Goa, India, Oct. 1-6, 2008.
- Member of the Organizing Committee and Co-Chair for Short Courses, at the ASCE Geo-Institute's annual conference, *GeoCongress 08 – The Challenge of Sustainability in the Geoenvironment*, March 9-12, 2008, New Orleans, LA.
- Member of the Organizing Committee, and Chair of the Technical Committee for the ASCE Geo-Institute's annual conference, *Geo-Denver 2007*, Feb. 18-21, 2007, Denver, CO.
- Member, Technical Committee for the *Fourth International Conference on Unsaturated Soils (UNSAT'06)*, April 2-5, 2006, Carefree, AZ.
- Session organizer and co-chair for session on "Innovative Barriers and Barrier Materials" to be held at ASCE Geo-Institute's *Geo-Frontiers 2005*, Jan. 24-26, 2005, Austin, TX.
- Member, International Advisory Committee for the *5th International Congress of Environmental Geotechnics*, University of Wales, Cardiff, UK, June 26-30, 2006.
- Chair, Organizing Committee, conference on *Tailings and Mine Waste '04*, Oct. 10-13, 2004, Vail Cascade Resort and Spa, Vail, CO.
- Moderator, breakout session on "Contaminant Transport and Multiphase Flows", *Soil and Rock America Conference*, June 22-26, 2003, Cambridge (MIT), MA.
- Member, Organizing Committee, conference on *Tailings and Mine Waste '03*, Oct. 12-15, 2003, Vail Cascade Resort and Spa, Vail, CO.
- Member, Session Organizing Committee for session on "Clay Membrane Processes" held at the *39th Annual Meeting of the Clay Minerals Society: Bolder Clays*, June 8-13, 2002, Boulder, CO.
- Organized and moderated session on, "The Rocky Mountain Regional Hazardous Substance Research Center", at *Tailings and Mine Waste '02*, Jan. 27-30, 2002, Colorado State University, Fort Collins, CO.
- Member, Organizing Committee, conference on *Tailings and Mine Waste '02*, Jan. 27-30, 2002, Colorado State University, Fort Collins, CO.
- Member, Session Organizing Committee for session on "Montmorillonites in Geoenvironmental Engineering" held at the *2001 Clay Minerals Society Annual Meeting*, June 16-20, Madison, WI.

PROFESSIONAL ACTIVITIES AND SERVICE (continued)

Moderator and Session/Conference Organizer (continued)

- Member, Session Organizing Committee for session on "modeling" held at the 2001 *International Containment & Remediation Technology Conference and Exhibition*, June 10-13, Orlando, FL.
- Member, Organizing Committee, conference on *Tailings and Mine Waste '01*, Jan. 15-18, 2001, Colorado State University, Fort Collins, CO.
- Member, Conference Organizing Committee, and Sub-Committee Chair of Pre-Conference Short Courses for the ASCE Geo-Institute's annual conference, *GeoDenver 2000*, Aug. 5-8, 2000, Denver, CO.
- Session organizer and moderator, sessions MOC21 and MOD21 on "Unsaturated Soils, Flow and Transport, I and II" at the ASCE Geo-Institute's annual conference *GeoDenver 2000*, Denver, CO, Aug. 7, 2000.
- Member of the International Advisory Board for the *International Symposium on Physical Modelling and Testing in Environmental Geotechnics*, sponsored by the Network of European Centrifuges for Environmental Geotechnics Research (NECER), May 15-17, 2000, La Baule, France.
- Member, Organizing Committee, conference on *Tailings and Mine Waste '00*, Jan. 23-26, 2000, Colorado State University, Fort Collins, CO.
- Moderator, 2 sessions at the 2nd British Geotechnical Society's Conference on *Geoenvironmental Engineering, Ground Contamination: Pollutant Management and Remediation*, Sept. 13-15, 1999, London, UK.
- Member, Organizing Committee, conference on *Tailings and Mine Waste '99*, Jan. 24-27, 1999, Colorado State University, Fort Collins, CO.
- Member, International Organizing Committee for the *4th International Symposium on Environmental Geotechnology and Global Sustainable Development*, Aug. 9-12, 1998, Boston, MA.
- Member, Organizing Committee, conference on *Tailings and Mine Waste '98*, Jan. 26-28, 1998, Colorado State University, Fort Collins, CO.
- Moderator, Session GEO4 on "In Situ Containment Technologies", ASCE Spoke Conference on *In Situ Remediation of the Geoenvironment*, Oct. 5-8, 1997, Minneapolis, MN.
- Moderator, Session 4 on "Modeling II: Transport through Barriers", *1997 International Containment Technology Conference and Exhibition*, Feb. 9-12, 1997, St. Petersburg, FL.
- Member, Organizing Committee, conference on *Tailings and Mine Waste '97*, Jan. 13-17, 1997, Colorado State University, Fort Collins, CO.
- Member, Organizing Committee for ASCE Geotechnical Engineering Division Specialty Conference, *Uncertainty in the Geologic Environment: From Theory to Practice*, July 31 - Aug. 2, 1996, University of Wisconsin-Madison, WI.
- Member, Organizing Committee, conference on *Tailings and Mine Waste '96*, Jan. 16-19, 1996, Colorado State University, Fort Collins, CO.
- Moderator, Session 3-B on "Chemical Interactions and Remediation", ASCE Specialty Conference on *Geoenvironment 2000*, Feb. 24-26, 1995, New Orleans, LA.
- Member, Organizing Committee, conference on *Tailings and Mine Waste '95*, Jan. 17-20, 1995, Colorado State University, Fort Collins, CO.
- Member, Organizing Committee, conference on *Tailings and Mine Waste '94*, Jan. 19-21, 1994, Colorado State University, Fort Collins, CO.
- Organizer and Moderator for Session on "Site Remediation: Waste Extraction" at the *Symposium on Environmental Geotech*, ASCE National Convention, Sept. 16-17, 1992, New York, NY.

Paper Reviews for Journals

- *Acta Geotechnica* (reviewed 1 paper in June 2008).
- *Advances in Environmental Research* (reviewed 1 paper in June 2000).
- *Advances in Water Research*, Elsevier Science, Amsterdam (reviewed 1 paper in March 2005).

PROFESSIONAL ACTIVITIES AND SERVICE (continued)

Paper Reviews for Journals (continued)

- *Applied Clay Science*, Elsevier Science, Amsterdam (reviewed 1 paper in June 1997, 1 paper in July 2003, 1 paper in April 2005, 1 paper in July 2005, 1 paper in 2011).
- *Applied Geochemistry*, Elsevier Science, Amsterdam (reviewed 1 paper in 2005).
- *Applied Radiation & Isotopes*, Elsevier Science, Amsterdam (reviewed 1 paper in 2005).
- *Canadian Geotechnical Journal*, CGS, Ottawa (reviewed 3 papers in 1992 and 1994, 1 paper in 1996, 1 paper in 2005, 1 paper in 2008 with re-review in April 2009, 3 papers in 2009, 1 paper in 2010, 3 papers in 2011).
- *Chemical Engineering Communications*, Taylor and Francis, London (reviewed 1 paper in 2009).
- *Clays and Clay Minerals*, Clay Minerals Society, Aurora, CO (reviewed 1 paper in 1994, reviewed 1 paper 2004, 2 papers in 2005).
- *Engineering Geology*, Elsevier Science, Amsterdam (reviewed 1 paper in 1999, 1 paper in 2000, 3 papers in 2007, 1 paper in 2008, 3 papers in 2011).
- *Environmental and Engineering Geoscience*, Association of Environmental & Engineering Geologists and the Geological Society of America (reviewed 1 paper in 2011).
- *Environmental Science and Technology*, ACS (reviewed 1 paper in 1997, 1 paper in 2000, 1 paper in 2003, 2 papers in 2004, 1 paper in 2006, 1 paper in 2007, 1 paper in 2009, 1 paper in 2010, 1 paper in 2011).
- *Geochemica et Cosmochimica Acta*, Elsevier Science, Amsterdam (reviewed 1 paper in 2001, 1 paper in 2002, 1 paper in 2004, 1 paper in 2005).
- *Geomechanics and Engineering*, Techno Press, Korea (reviewed 1 paper in 2009)
- *Geomechanics and Geoengineering: An International Journal*, Taylor and Francis, London (reviewed 1 paper in 2007, 1 paper in 2008;)
- *Geosynthetics International*, International Geosynthetics Society (reviewed 1 paper in 2000, 2 papers in 2003).
- *Geotechnical and Geological Engineering*, Kluwer Academic Publ., The Netherlands (reviewed 1 paper in 1998, 1 paper in 2009).
- *Geotechnical Testing Journal*, ASTM, West Conshohoken, PA (review ~ 2 to 3 papers/yr since 1992-2004, reviewed 1 paper in 2005, 1 paper in 2010, 1 paper in 2011).
- *Geotechnique*, Institution of Civil Engineers, London, UK (reviewed 1 paper in 2004)
- *Geotextiles and Geomembranes*, Elsevier Science, Amsterdam (reviewed 1 paper in 1999, 2 papers in 2008, 1 paper in 2009, 2 papers in 2010, 2 papers in 2011).
- *International Journal for Numerical and Analytical Methods in Geomechanics*, John Wiley & Sons, Inc., New York (reviewed 1 paper in 2001, 1 paper in 2005, 1 paper in 2008, 3 papers in 2009).
- *International Journal of Solids and Structures* (reviewed 1 paper in 2001).
- *Journal of Aquatic Geochemistry*, Springer-Science + Business Media B.V., Dordrecht, The Netherlands (reviewed 1 paper in 2004).
- *Journal of Contaminant Hydrology*, Elsevier Science, Amsterdam (reviewed 1 paper in 1997, 1 paper in 1995, 1 paper in 1999, 1 paper in 2001, 1 paper in 2002, 4 papers in 2003, 1 paper in 2004, 1 paper in 2005, 1 paper in 2005, 1 paper in 2006, 1 paper with re-review in 2007).
- *Journal of Environmental Engineering*, ASCE, Reston, VA (review ~1 paper/yr since 1999-2009, 2 papers in 2010, 1 paper in 2011).
- *Journal of Environmental Engineering and Science* (reviewed 1 paper in 2001, 1 paper in 2003).
- *Journal of Environmental Quality* (reviewed 1 paper in 2000).
- *Journal of Geophysical Research – Solid Earth*, American Geophysical Union, Washington, D. C. (reviewed 1 paper in 2004, 1 paper in 2005).
- *Journal of Geotechnical and Geoenvironmental Engineering*, ASCE, Reston, VA (reviewed 2 to 10 papers/yr since 1988-2004; reviewed 6 papers in 2004, 9 papers in 2005, 7 papers in 2007, 7 papers in 2008, 6 papers in 2009, 5 papers in 2010, 4 papers in 2011).

PROFESSIONAL ACTIVITIES AND SERVICE (continued)

Paper Reviews for Journals (continued)

- *Journal of Ground Water*, National Ground Water Association, OH (reviewed 1 paper in 2004).
- *Journal of Hydrology*, Elsevier Science, Amsterdam (reviewed 2 papers in 1994).
- *Journal of Infrastructure Systems*, ASCE (reviewed 1 paper in 1994).
- *Journal of Material Cycles and Waste Management*, Japan Society of Waste Management Experts (reviewed and re-reviewed 1 paper in 2001).
- *Journal of Soil Contamination* (reviewed 1 paper in 1998).
- *Journal of Soil and Sediment Contamination: An International Journal* (reviewed 1 paper in 2002, 1 paper in 2003).
- *Journal of the Transportation Review Board*, TRB (reviewed 2 papers in 2000 and 2 papers in 2001).
- *Practice Periodical of Hazardous, Toxic, and Radioactive Waste Management*, ASCE, Reston, VA (reviewed 1 paper in 2001).
- *Separation Science and Technology*, Marcel Dekker, New York (reviewed 1 paper in 2002).
- *Soil Science* (reviewed 1 paper in 1996).
- *Soils and Foundations*, Japanese Geotechnical Society, Tokyo (reviewed 1 paper in 2003).
- *Transport in Porous Media*, Kluwer Academic Publ., The Netherlands (reviewed 1 paper in 1991, 1 paper in 2005, 1 paper in 2007, 1 paper in 2011).
- *Water Environment Research*, Water Environment Federation, Alexandria, VA (reviewed 1 paper in 2000, 1 paper in 2002, and 1 paper in 2003).
- *Waste Management*, Pergamon Press Publ., NY (reviewed 1 paper in 1991, 1 paper in 1997, 1 paper in 1998, 1 paper in 2009).
- *Water Resources Research*, American Geophysical Union, Washington, D.C. (reviewed 2 papers in 2004, 2 papers in 2008, 2 papers in 2011).

Paper Reviews for Conferences

- ASCE Geo-Institute's *Geo-Congress 2012: State of the Art and Practice in Geotechnical Engineering*, Oakland, CA, March 25-29, 2012 (reviewed 4 papers in 2011).
- ASCE Geo-Institute's *Geo-Frontiers 2011: Advances in Geotechnical Engineering*, Dallas, TX, March 13-16, 2011 (reviewed 2 papers in 2010).
- *3rd International Symposium on Geosynthetic Clay Liners, GBR-C 2k10*, Würzburg, Germany, Sept. 15-16, 2010 (reviewed 2 papers in 2010).
- ASCE Geo-Institute's *GeoFlorida 2010: Advances in Analysis, Modeling & Design*, West Palm Beach, Feb. 20-24, 2010 (reviewed 2 papers in 2009).
- ASCE Geo-Institute's *GeoCongress 2008: The Challenge of Sustainability in the Geoenvironment*, New Orleans, March 9-12, 2008 (reviewed 3 papers in 2007).
- Industrial Fabrics Association Internal (IFAI) "*GeoAmericas 2008 – The First Pan American Geosynthetics Conference and Exhibition*", Cancun, Mexico, March 2-5, 2008 (reviewed 4 papers in 2007).
- *Fifth International Congress on Environmental Geotechnics (5ICEG)*, International Society for Soil Mechanics and Geotechnical Engineering (ISSMGE), Cardiff, UK, June 26-30, 2006 (reviewed 19 papers in 2005).
- *UNSAT06*, ASCE Geo-Institute, Carefree, AZ, April 2-5, 2006 (reviewed 7 papers in 2005).
- *Geo-Frontiers 2005*, ASCE Geo-Institute, Austin, TX, Jan. 24-26, 2005 (reviewed 10 papers in 2004).
- 2004 Biennial Colorado Geotechnical Seminar, *H₂GEO: Geotechnical Engineering for Water Resources*, Denver, CO, Oct. 22, 2004 (reviewed 1 paper in 2004).
- *2004 Annual Meeting of the Transportation Research Board (TRB)*, Washington, D.C., Jan. 2004 (reviewed 1 paper in 2003).

PROFESSIONAL ACTIVITIES AND SERVICE (continued)

Paper Reviews for Conferences (continued)

- *SARA (Soil and Rock America) Conference & 12th Panamerican Conference*, Boston, June 22-26, 2003 (reviewed 2 papers).
- *GeoEng 2000*, Melbourne, Australia, Nov. 19-24, 2000 (reviewed 4 papers).
- *Geosynthetics '99*, IFAI, Boston, MA, April 28-30, 1999 (reviewed 4 papers).
- *Filtration and Drainage in Geotechnical/Geoenvironmental Engineering*, ASCE National Convention, Boston, MA, Oct. 1998 (reviewed 1 paper).
- *GeoEnvironment 97: 1st Australia - New Zealand Conference on Environmental Geotechnics*, Melbourne, Nov. 26-28, 1997 (reviewed 3 papers).
- ASCE Specialty Conference on *In Situ Remediation of the Geoenvironment*, Minneapolis, MN, Oct. 5-8, 1997 (handled the review of 7 papers).
- *1997 International Containment Technology Conference and Exhibition*, St. Petersburg, Florida, Feb. 9-12, 1997 (handled review of 6 papers).
- *14th International Conference on Soil Mechanics and Foundation Engineering* at Hamburg, Germany (served on *ad hoc* committee to review all abstracts and submitted papers from the US National Society of ISSMFE: April and July, 1996).
- *ISSMFE 2nd International Congress on Environmental Geotechnics, IS-Osaka '96*, Osaka, Japan, Nov. 5-8, 1996 (reviewed 10 papers in 1996).
- ASCE Specialty Conference on *Uncertainty in the Geologic Environment: From Theory to Practice*, Madison, WI, Aug. 1-3, 1996 (reviewed 6 papers 1995 – 1996).
- ASCE Specialty Conference on *The Geoenvironment 2000*, New Orleans, Feb. 24-26, 1995 (reviewed 7 papers in 1994).
- *ISSMFE 1st International Congress on Environmental Geotechnics*, Edmonton, Alberta, Canada, July 10-15, 1994 (reviewed 2 papers in 1993).
- *ASTM Symposium on Hydraulic Conductivity and Waste Contaminant Transport in Soil*, San Antonio, Jan. 21 & 22, 1993 (reviewed 4 papers in 1992).
- *13th International Conference on Soil Mechanics and Foundation Engineering* at New Delhi, India, 1992 (reviewed 2 abstracts and 2 papers in 1992).
- *Session on Geo-Environmental Properties of Soil and Rock*, 71st Annual Meeting of the Transportation Research Board, National Research Council, Washington, DC, Jan. 1992 (reviewed 3 papers in 1991).
- ASCE Geotechnical Special Publication No. 26 on *Waste Containment Systems: Construction, Regulation, and Performance*, ASCE National Convention, San Francisco, CA, Nov. 6-7, 1990 (reviewed 1 paper in 1990).

Book (Published) Reviews

- Bai, M. B. and Elsworth, D. (2000), *Coupled Processes in Subsurface Deformation, Flow and Transport*, ASCE, Reston, VA (reviewed in 1999).
- Sharma, H. D., and Lewis, S. P. (1994), *Waste Containment Systems, Waste Stabilization, and Landfills*, John Wiley and Sons, Inc., New York. (reviewed in Nov., 1993).

PROFESSIONAL ACTIVITIES AND SERVICE (continued)

Proposal Reviews

- *National Science Foundation*, Arlington, VA:
 - External reviewer for at-large proposals (Jan. 2000, Jan. 2001, Sept. 2001, Jan. 2003, March 2003, March 2004, March 2005, Nov. 2005, Feb. 2007, Nov. 2008, Dec. 2008).
 - Proposal review panel member for Career Development Program, *GeoEnvironmental Engineering and GeoHazards Mitigation Program*, Civil, Mechanical and Manufacturing Innovation (2006).
 - Proposal review panel member for proposals on sustainability (June 2008)
 - Proposal review panel member for at-large proposals (May 2002).
 - Proposal review panel member for at-large proposals (1998).
 - Proposal review panel member for Career Development Program (1997).
 - Proposal review panel member for Career Development Program (1995).
 - Proposal review panel member for National Young Investigator Program (1993).
 - At large proposal evaluations (~ 4 per year, 1989-1994).
- *Natural Sciences and Engineering Research Council of Canada*, Ottawa, Canada:
 - External reviewer for Discovery Grant proposals (2 in Jan. 2009)
 - External reviewer for at-large proposals (Jan. 2001, Aug. 2001, Aug. 2002).
 - External reviewer for Collaborative Research and Development Grants–Project Application (Aug. 2004)
 - External reviewer for E. W. R. Steacie Memorial Fellowship (Oct. 2004)
- *The US Civilian Research and Development Foundation (CRDF)*, Arlington, VA (Nov. 2007)
- *The Petroleum Research Fund*, American Chemical Society, Washington, D.C. (May 2006)
- *Kentucky Science and Engineering Foundation R&D Excellence Program Proposals* (Feb. 2003).
- *2003 Victoria Fellowship*, State Government of Victoria, Australia (April 2003).
- Phase I of *Business Technology Transfer (STIR) Programs*, U.S. Department of Energy (May 2003).
- *Women's International Science Collaboration (WISC) Program 2001-2003* of the American Association for the Advancement of Science (Aug. 2003).
- *The Petroleum Research Fund*, American Chemical Society, 1155 16th Street, NW, Washington, DC 20036 (proposal reviewed 11/24/97 and 05/01/06).
- Environmental Sciences Branch, US Army Research Office, Research Triangle Park, NC 27709-9943 (reviewed in 1992).
- State of Louisiana, Board of Regents (reviewed in 1992).
- *Canadian Foundation for Innovation* (Oct. 2001, Oct. 2003).
- University of Wisconsin *Water Resources Institute* (Dec. 2001, Dec. 2002, Dec. 2003).

ASTM Standards Review

- Reviewer for draft of ASTM standard on, "Standard Test Method for Determination of Hydraulic Conductivity of Saturated Soils with Aqueous Liquids Using a Flexible-Wall Permeameter" (Dec. 2003 – Oct. 2004).

Professional/Research Report Reviews

- Reviewed draft report on: *Tank Wastes Planned for Onsite Disposal at Three Department of Energy Sites: The Savannah River Site*, Nuclear and Radiation Studies Board, National Research Council, Washington, D.C. (June 2005)
- Reviewed draft report on: *Remedial Action at the Moab Site-Safety Now and for the Long Term*, Board on Radioactive Waste Management, National Research Council, Washington, D.C. (May 2002)
- Water Resources Institute, West Virginia University (reviewed in 1992).

COMMUNITY SERVICE

- Advisory Council Member, Colorado Science and Engineering Fair (1998-1999).
- Volunteer Science Fair Judge, Long's Peak Science Fair, U. of Northern Colorado, Greeley, CO (1988, 1989).

PERSONAL REFERENCES

- Dr. Akram N. Alshwabkeh, George A. Snell Professor of Engineering and Director of the Puerto Rico Testsite for Exploring Contamination Threats (PRoTECT) Center, Department of Civil and Environmental Engineering, 400 Snell Engineering Center, Northeastern University, 360 Huntington Avenue, Boston, MA 02115, (617) 373-3994, *aalsha@coe.neu.edu*.
- Dr. Craig H. Benson, Wisconsin Distinguished Professor, Geological Engineering, University of Wisconsin, 2218 Engineering Hall, 1415 Engineering Drive, Madison, WI 53706, (608) 262-7242, *chbenson@wisc.edu*.
- Dr. John J. Bowders, Jr., Croft Distinguished Professor of Civil Engineering, Institute for Interdisciplinary Geotechnics (I2G), Dept. of Civil and Environmental Engineering, E2509 Lafferre Hall, University of Missouri-Columbia, Columbia, MO 65211-2100, (573) 882-8351, *bowders@missouri.edu*.
- Dr. David E. Daniel, President, The University of Texas at Dallas, PO Box 830688, Richardson, TX 75083-0688, (972) 883-2201, *dedaniel@utdallas.edu* (or: *david.daniel@utdallas.edu*).
- Dr. Jeffrey C. Evans, Professor and Chair, Dept. of Civil and Environmental Engineering, Bucknell University, Lewisburg, PA 17837, (570) 577-1371 or (570) 577-1620, *evans@bucknell.edu*.
- Dr. Mario Manassero, Professor of Engineering (Prof. Ing.), Dipartimento Georisorse E Territorio, Politecnico Di Torino, Corso Duca degli Abruzzi, 24, I 10129 Torino, Italy, +39-011-564-7705, *manassero@polito.it*.