

John A. Connor, P.E., P.G., D.E.E.

Biographical Summary

Mr. Connor is President of GSI Environmental, Inc. (GSI), in Houston, Texas. He received an M.S. in Civil Engineering from Stanford University and has over 26 years of experience in environmental engineering, with specialization in environmental site investigation, human health and ecological risk assessment, and corrective action design. Mr. Connor is Registered Professional Engineer, a Licensed Professional Geoscientist, and a Diplomate in the American Academy of Environmental Engineering. He has served as an instructor in Groundwater Hydrology at the University of Houston, a Certified Trainer for the USEPA/ASTM Risk-Based Corrective Action (RBCA) Training Initiative, and as a technical consultant for development of risk-based regulatory programs in approximately 15 states across the U.S., as well as in Canada and Puerto Rico. He has developed and presented training courses on the Texas Risk Reduction Program (TRRP) rules to the staff of the Texas Commission on Environmental Quality (TCEQ) and over 2000 consulting and industry personnel in the state of Texas. He is the principal author of the "RBCA Tool Kit for Chemical Releases," the most widely used software program for evaluation of soil and groundwater remediation sites. In addition, he has authored numerous technical publications regarding natural attenuation, chemical fate and transport modeling, environmental risk assessment, and remediation technologies, and has developed and presented technical training programs on these topics in the U.S., Canada, Latin America, and overseas. Mr. Connor has been designated as an expert witness for numerous cases involving forensic analysis of environmental impacts, natural resource damage assessment, remediation of soil, groundwater, and surface water pollution problems, and allocation of liability for projects in the U.S., Latin America, and the Middle East. Mr. Connor is fluent in English and Spanish.

Professional Background

President – Environmental/Geotechnical Engineer, GSI Environmental, Inc. (formerly Groundwater Services, Inc.), Houston, Texas. 1986 to present

Instructor, Graduate Environmental Engineering Program, Department of Civil Engineering, University of Houston, Houston, Texas. 1988 - 1989

Geotechnical Manager, S & B Engineering Inc., Houston, Texas. 1982 - 1987

Geotechnical Project Engineer, Shannon & Wilson, Inc., Houston, Texas. 1980 -1982

Teaching Fellow, School of Engineering, Stanford University, Stanford, California. 1978 - 1980

Patents

Connor, J.A., D.A. Clifford, P.T. King, "Method of Controlling the Production of Radioactive Materials from a Subterranean Reservoir," U.S. Patent 5,196,124, Publication Date: March 23, 1992.

Connor, J. A., D. A. Clifford, P. King, "Method of Reducing the Level of Contaminant Materials in Produced Subterranean Reservoir Fluids," Commonwealth of Australia, Document No. AU-B-39238/93, Acceptance No. 669361, Publication Date : March 16, 1993.

Education

M.S., Civil Engineering with specialty in Geotechnical Engineering, Stanford University, 1979.

B.A., English with distinction, Phi Beta Kappa, Stanford University, 1978.

Professional Certifications and Affiliations

Registered Professional Engineer, Texas No. 62707

Licensed Professional Geoscientist, Texas Board of Professional Geoscientists, Soil Science, License No. 4266

Diplomate, American Academy of Environmental Engineers

Texas Certified LPST Corrective Action Project Manager, Registration No. CAPM00656

Past Chairman, Houston Local Emergency Planning Committee (LEPC)

Certified Trainer for the ASTM Risk-Based Corrective Action (RBCA) Training Initiative

Professional Certifications and Affiliations (continued)

Past Board Member, Houston Land Redevelopment Committee, U.S. EPA Brownfields Program
Advisory Board, Citizen's Environmental Coalition
Member, Ecological Risk Assessment Workgroup, Texas Risk Reduction Program
Member, Phi Beta Kappa Society

Publications

- Connor, J. A., F. Ahmad, K.C. Hamel, R.J. Pokluda, K. Ravishankar (2007), Practical Guidelines for Roadspreading of Exploration & Production (E&P) Wastes. 14th Annual International Petroleum Environmental Conference, Houston, Texas. November 6 – 9, 2007.
- Newell, C.J., and J.A. Connor, 2006, "Strategies for Addressing Salt Impacts of Produced Water Releases to Plants, Soils, and Groundwater," American Petroleum Institute (API), Produced Waste Issues Group.
- Connor, J. A., F. Ahmad, and T. E. McHugh (2006), Evaluation of Vapor Intrusion from a Subsurface Diesel Plume Using Multiple Lines of Evidence. Petroleum Hydrocarbons and Organic Chemicals in Ground Water: Prevention, Assessment, and Remediation Conference, Houston, Texas. November 6-7, 2006.
- Connor, J. A., R.L. Bowers, S.I. Maberti, J.C. Mejia, K. Ravishankar, S.Y. Alvarez (2006), Use of Risk-Based Criteria for Characterization of Environmental Remediation Liabilities in Upstream Oil and Gas Production Facilities. 13th Annual International Petroleum Environmental Conference, San Antonio, TX. October 17-20, 2006.
- Connor, J. A., C.J. Newell, H.H. Hopkins (2006). Practical Guidelines for Addressing Impacts of Produced Water Releases to Plants, Soil, and Groundwater. 13th Annual International Petroleum Environmental Conference, San Antonio, Texas. October 17-20, 2006.
- Connor, J.A. (co-author), 2005, "Standard Guide for Application of Engineering Controls to Facilitate Use or Redevelopment of Chemical-Affected Properties, ASTM E2435-05," ASTM International, West Conshohocken, PA, July 2005.
- Connor, J.A., F. Ahmad, and R.L. Bowers, 2005, "Technical Evaluation of Natural Resources Damage Assessments (NRDA) of Groundwater Resources," Proceedings of the National Ground Water Association (NGWA) Ground Water and Environmental Law Conference, Baltimore, Maryland, July 2005.
- Connor, J.A., C.J. Newell, and D.L. Rowen, "Groundwater Remediation Strategies Tool", American Petroleum Institute, Regulatory Analysis & Scientific Affairs Department, Publication Number 4730, December 2003.
- Connor, J.A., and T. E. McHugh, 2002, "Impact of Risk-Based Corrective Action (RBCA) on State Corrective Action Programs," Human and Ecological Risk Assessment, CRC Press.
- Connor, J.A., R.L. Bowers, and T.E. McHugh, "RBCA Toolkit: Comprehensive Risk-Based Modelling System for Soil and Groundwater Cleanup," in Linders, J.B.H.J. (ed.), Modelling of Environmental Chemical Exposure and Risk, Kluwer Academic Publishers, The Netherlands, 2001.
- Connor, J. A., T. E. McHugh, C. Clarke, P. Lewis, "TNRCC Texas Risk Reduction Program (TRRP) Training Seminar, Modules 1 - 3," course training materials, Groundwater Services, Inc., Houston, Texas, 2000.
- Connor, J. A. and T. E. McHugh, "Risk-Based Decision-Making Performance Assessment Study: Study Results and Recommendations for RBDM Program Performance Monitoring," ASTM Technical Bulletin, USEPA Cooperative Agreement X825708-01, March 2000.
- Connor, J. A., R. L. Bowers, J. P. Nevin, R. T. Fisher, "RBCA Tool Kit for Chemical Releases," Groundwater Services, Inc., Houston, Texas, 1999.
- Connor, J.A., "User's Guide to Wisconsin Corrective Action Rules," Wisconsin Department of Natural Resources, Madison, Wisconsin, Publication No. RR-576-07, 1999 (pending).

Publications (continued)

- Connor, J. A., and R. L. Bowers, "Guidelines for Risk-Based Corrective Action Modeling for Chemical Release Sites," Proceedings of the Petroleum Hydrocarbons and Organic Chemicals in Groundwater Conference, Houston, Texas, November 1998.
- Connor, J.A., R.L. Bowers, S.M. Paquette, and C.J. Newell, "Soil Attenuation Model for Derivation of Risk-Based Soil Remediation Standards," National Groundwater Association, Proceedings of the Petroleum Hydrocarbons and Organic Chemicals in Groundwater Conference, Houston, Texas, November 1997.
- Connor, J.A., J.P. Nevin, M. Malander, C. Stanley, and G. DeVuall, "Tier 2 RBCA Guidance Manual for Risk-Based Corrective Action," Groundwater Services, Inc., Houston, Texas, January 1996, 126 p.
- Connor, J.A., "Wisconsin RBCA Fact Sheet," Wisconsin Department of Natural Resources, Madison, Wisconsin, 1996.
- Connor, J. A., C. J. Newell, M. W. Malander, "Parameter Estimation Guidelines for Risk-Based Corrective Action Modeling," National Groundwater Association, Proceedings of the Petroleum Hydrocarbons and Organic Chemicals in Groundwater Conference, Houston, Texas, November 1996.
- Connor, J.A., M. Malander, A. Guisseppi-Elie, "RBCA State Risk Policy/Strategy Issues Workbook," Groundwater Services, Inc., Houston, Texas, 1995, 44 p.
- Connor, J.A., J.P. Nevin, R.T. Fisher, R.L. Bowers, and C. J. Newell, "RBCA Spreadsheet System and Modeling Guidelines Version 1.0.," Groundwater Services, Inc., Houston, Texas, 1995.
- Connor, J. A. and D. A. Clifford, "NORM Waste Minimization Using In-Situ Treatment Method," The American Oil and Gas Reporter, December 1994.
- Connor, J.A., C.J. Newell, J.P. Nevin, and H.S. Rifai, "Guidelines for Use of Groundwater Spreadsheet Models in Risk-Based Corrective Action Design," National Ground Water Association, Proceedings of the Petroleum Hydrocarbons and Organic Chemicals in Ground Water Conference, Houston, Texas, November 1994, pp. 43-55.
- Connor, J.A., "Hydrogeologic Site Investigations," in P.B. Bedient, H.S. Rifai, and C.J. Newell, Ground Water Contamination: Transport and Remediation, Prentice Hall, Englewood Cliffs, NJ, 1994.
- Connor, J.A., D.A. Clifford, P.T. King, "In-Situ Method for Reducing the Production of Naturally-Occurring Radioactive Materials (NORM) from Subsurface Reservoirs," Proceedings of Petro-Safe '93, 4th Annual Environmental, Safety and Health Conference for Oil, Gas, and Petrochemical Industries, Houston, Texas, January 1993, Book 3, Volume IX, pp. 461-478.
- Connor, J.A., "GSI User's Guide: Texas Risk Reduction Rules for Closure/Remediation," Groundwater Services, Inc., Houston, Texas, 1993, 16 p.
- Connor, J.A., C.J. Newell, and D.K. Wilson, "Assessment, Field Testing, and Conceptual Design for Managing Dense Non-Aqueous Phase Liquids (DNAPLs) at a Superfund Site," Proceedings of the Conference on Petroleum Hydrocarbons and Organic Chemicals in Groundwater, National Water Well Association, Houston, Texas, November 1989.
- Connor, J.A., and J.B. Blackburn, "A Critical Examination of the Small Quantity Generator Exemption," State Bar of Texas Environmental Law Journal, Vol. 14, No. 3, June 1984.
- DeVuall, G., Ettinger, R., Hansen, E., MacDonald, R., Stanley, C., Johnson, P., Connor, J., and P. Nevin, "Tier 1 Guidance Manual for Risk-Based Corrective Action and Overview of the Process," Shell Oil Company, Houston, Texas, October 1995.
- Freeberg, K.M., P.B. Bedient, J.A. Connor, "Modeling of TCE Contamination and Recovery in a Shallow Sand Aquifer," Ground Water Journal, National Water Well Association, Vol. 25, No. 1, January-February 1987.

Publications (continued)

- McLeod, R.K. and J.A. Connor, "Impact of Environmental Regulations on Small Business," Proceedings of Haztech International Conference, Houston, Texas, February 1992, pp. 5B-1 to 5B-9.
- McHugh, T.E., J.A. Connor, and F. Ahmad, "An Empirical Analysis of the Groundwater-to-Indoor-Air Exposure Pathway: The Role of Background Concentrations in Indoor Air," *Environmental Forensics*, 5:33–44, 2004
- McHugh, T.E., J.A. Connor, F. Ahmad, and C.J. Newell, "A Groundwater Mass Flux Model for Groundwater-to Indoor Air Vapor Intrusion," in: V.S. Magar and M.E. Kelley (Eds.), *In Situ and On-Site Bioremediation—2003*, Proceedings of the Seventh International In Situ and On-Site Bioremediation Symposium, Orlando, FL; June 2003, published by Battelle Press, Columbus, OH, 2003.
- Nevin, J. P., C.J. Newell, J.A. Connor, T.E. McHugh, N.J. Novick, "Practical Methods for Demonstration of Groundwater Remediation by Natural Attenuation (RNA)," National Groundwater Association, Proceedings of the Petroleum Hydrocarbons and Organic Chemicals in Groundwater Conference, Houston, TX, November 1998.
- Newell, C.J., H.S. Rifai, J.T. Wilson, J.A. Connor, J.J. Aziz, M.P. Suarez, 2002. *Calculation and Use of First Order Rate Constants for Monitored Natural Attenuation Studies*, U.S. EPA Ground Water Issue, U.S. Environmental Protection Agency, EPA/540/S-02/500, November 2002.
- Newell, C.J. and J.A. Connor, "Characteristics of Dissolved Hydrocarbon Plumes: Results from Four Studies" American Petroleum Institute Society and Groundwater Task Force, 1999.
- Newell, C.J. and J.A. Connor, "Detection and Delineation of Subsurface DNAPL Distribution, " Water Environment Foundation DNAPL Preconference Seminar, WEF, New Orleans, LA., September 23, 1992.
- Newell, C.J. and J.A. Connor, "Assessment, Field Testing, and Conceptual Design for Managing Dense Nonaqueous Phase Liquids (DNAPLs) at a Superfund Site," EPA DNAPL Workshop, Dallas, Texas, R.S. Kerr Environmental Research Lab., U.S. EPA, April 1991.
- Newell, C.J., J.A. Connor, D.K. Wilson, and T.E. McHugh, "Impact of Dissolution of Dense Non-Aqueous Phase Liquids (DNAPLs) on Groundwater Remediation," Petroleum Hydrocarbons and Organic Chemicals in Groundwater, NWWA, Houston, Texas, November 1991.
- Newell, C.J., J.A. Connor, and D.K. Wilson, "Pilot Test for Evaluating the Effectiveness of Enhanced In-Situ Biodegradation for Soil Remediation," Petroleum Hydrocarbons and Organic Chemicals in Groundwater, NWWA, Houston, Texas, October 1990.
- Todd, D., J.A. Connor, and J. Hope, "Houston Report: Air Quality, Water Quality, Solid Waste Management," Citizens Environmental Coalition, Houston, Texas, January 1986.
- Yare, B.S., J.A. Connor, and D.J. Schaezler, "Organic Contaminant Control in a Gulf Coast Aquifer," Proceedings of the Fourth National Symposium on Aquifer Restoration and Groundwater Monitoring, National Water Well Association, May 1984.

Project Experience

Risk-Based Site Assessment, Environmental Modeling, and Corrective Action Design

ASTM Standard for Use of Engineering Controls. Served as principal author and technical coordinator for development of "Standard Guide for Application of Engineering Controls to Facilitate Use or Redevelopment of Chemical-Affected Properties, ASTM E2435-05," published by ASTM International in July 2005. Guide addresses appropriate use of engineering controls, such as pavement, cutoff walls, vapor barriers, etc., to facilitate development and use of properties where soil or groundwater has been impacted by either man-made or natural contaminants.

West Coast Risk Prioritization Study, Major Oil Company. Directed detailed risk-based evaluation of over 300 retail petroleum fuels marketing sites in California, Arizona, Oregon, and Washington to model chemical fate-and-transport, define risk-based cleanup requirements, appropriate response actions, and associated costs.

Risk-Based Site Assessment, Environmental Modeling, and Corrective Action Design (continued)

Risk Reduction Planning Study, Pipeline Terminal Facility, North Central Texas. Directed a risk reduction planning study to identify the most cost-effective approach to environmental risks. Characterized principal source zones and receptors, conducted environmental fate-and-transport modeling, estimated applicable media clean-up levels, and compared the feasibility of site remediation per TNRCC Risk Reduction Standards.

Risk-Based Site Evaluations, Manufacturing Facility, Southeast Texas. Developed risk-based remediation goals for affected soil and groundwater at 26 individual waste management areas located within a synthetic rubber manufacturing facility. Prioritized the waste management areas for corrective action based on constituent reduction factors calculated for affected media at each unit.

Risk Assessment and Corrective Measures Study, Research Laboratory Facility and Chemical Manufacturing Facility, Gulf Coast Texas. Managed baseline risk assessments conducted to predict potential adverse impacts associated with hazardous constituent migration from the sites. Used groundwater solute transport models to predict constituent concentrations in hypothetical drinking water wells. Evaluated potential corrective action remedies on the basis of cost efficiency, implementation, and capability of providing a level of protection commensurate with Risk Reduction Standard 3 requirements.

Risk Assessment and Corrective Action Plan, Electronics Manufacturer, Northeast Texas. Directed environmental risk assessment and groundwater modeling study to determine appropriate media clean-up standards for two former waste management sites. Designed groundwater plume containment and soil venting system to achieve relevant risk reduction standards.

In-Situ Radionuclide Treatment Study, Chimney Hill Municipal Utility District, Houston, Texas. Designed and managed laboratory testing program and full-scale field pilot study to demonstrate effectiveness of patented method for removal of dissolved radionuclides from water supply well using in-situ filter.

Hydrogeologic Site Characterization and Baseline Risk Assessment, Chemical Manufacturer, Gulf Coast Texas. Directed extensive hydrogeologic site investigation and groundwater modeling study to characterize potential waste constituent migration from seven former waste management units. Determined applicable media clean-up levels per TNRCC Risk Reduction Standards. Characterized principal receptors and estimated baseline human health risks associated with each unit.

MOTCO Migration Management Project, MOTCO Superfund Site, La Marque, Texas. Provide technical oversight assistance for risk-based Management of Migration Study at a large Superfund site. Directed large-scale aquifer pumping test program to evaluate aquitard integrity, supervised data analysis, and selected hydraulic parameters for site risk assessment modeling study.

DNAPL Recovery Pilot Study, MOTCO Superfund Site, La Marque, Texas. Designed and directed pilot study for recovery of dense non-aqueous phase liquids (DNAPLs) from shallow aquifer underlying the MOTCO site.

Unsaturated Flow Modeling Study, Chemical Manufacturer, Gulf Coast Texas. Performed detailed unsaturated flow modeling study of six hazardous waste surface impoundments to determine if existing clay liners satisfied EPA specifications for containment of vertical leachate migration. This retrofitting variance was the first in the nation to receive formal EPA approval, resulting in large-scale savings in liner replacement costs.

Hydrogeologic Site Investigation and Recovery Well System Design, Installation, and Operation, Electronics Manufacturer, Stafford, Texas. Conducted hydrogeologic site investigation to characterize aquifer characteristics and delineate groundwater plume boundaries. Prepared final recovery well design specifications, and provided technical supervision for system start-up, operation, monitoring, and maintenance.

Groundwater Investigation, Natural Attenuation Investigation, and Risk Assessment, Major Chemical Manufacturing Facility, Houston, Texas. Site investigation, natural attenuation study, and risk assessment for soil, groundwater, and surface water impacts at major pesticide manufacturing facility. Evaluated hydrogeologic and geochemical environment to evaluate the speciation and mobility of agricultural chemicals in groundwater, including arsenate-based pesticides. Performed extensive trend analysis of historical monitoring data to assess stability of affected groundwater zones. Developed a conceptual model to predict the potential for contaminant migration, evaluate human and ecological risks, and assess appropriate response actions.

Risk-Based Site Assessment, Environmental Modeling, and Corrective Action Design (continued)

Evaluation of Arsenic Release, Chemical Manufacturing Facility, Texas Gulf Coast. Response to discovery of arsenic release to groundwater at a RCRA-permitted hazardous waste landfill. Performed investigation to evaluate background arsenic concentration, determine partitioning between sediments and groundwater, characterize geochemical environment, and evaluate mobility of arsenic in groundwater.

Allocation of Liability for Environmental Remediation

Sykes Superfund Site, Crosby, Texas: Provided environmental consulting and expert witness services regarding response to USEPA costs recovery action for remediation of former waste pit facility. Project involved detailed analysis of waste shipment records and environmental data to assess relative contribution of rubber manufacturing wastes to remediation costs, as well as evaluation and cost analysis of necessary remedial measures and compliance with applicable regulatory criteria.

Brown & Bryant Superfund Site, Shafter, California: Provided environmental consulting and expert witness services to a major agricultural chemicals manufacturing company to assist in negotiations with the California Department of Toxic Substances Control (DTSC) regarding risk evaluation and associated remediation requirements for former agricultural chemical distribution facility in Shafter, California. Project involved fate and transport analysis for various agricultural chemicals in soils and groundwater, including arsenic, toxaphene, and various soil fumigants.

Brown & Bryant Superfund Site, Arvin, California: Provided environmental consulting and expert witness services to a major agricultural chemicals manufacturing company to assist in negotiations with the USEPA Region 9 regarding risk evaluation and associated remediation requirements for former agricultural chemical distribution facility in Arvin, California. Project involved evaluation of chemical fate-and-transport, risk-based remediation requirements, and associated costs for groundwater impacted by for various agricultural chemicals.

Brio Superfund Site, Houston, Texas: Conducted detailed review of waste shipment records and chemical data to develop consensus liability allocation strategy for PRP Group at major superfund site.

Risk Management/Regulatory Policy Initiatives

Risk Management Process Guide and Software System, Developed internal risk management guidelines for remediation sites for major oil company, including exposure pathway screening; fate-and-transport modeling for air, soil, and groundwater; and remedy selection. Produced guidance document and accompanying data management software tools.

Determination of Risk-Based Corrective Action (RBCA) Levels, Various State Regulatory Agencies, Nationwide. Collaborated with state regulatory agencies and representatives of major petroleum retailers in developing risk-based corrective action methodology for cleanup levels applicable to environmental release sites in Florida, Illinois, Iowa, Michigan, New Jersey, Texas, Utah, and Wisconsin. Created framework for risk-based site evaluations and/or developed a series of "look-up" tables for incorporation into state environmental regulations, based on application of simple or sophisticated environmental fate-and-transport models for evaluation of potential air, soil, or groundwater exposures.

Conceptual Guide to the Texas Risk Reduction Program, Texas Natural Resource Conservation Commission (TNRCC), State of Texas. Contributor to the TNRCC draft conceptual guidance for the revised Texas Risk Reduction Program. Assisted in the development of a risk-based approach to help focus site investigations, apply simple or sophisticated fate-and-transport models for air, soil, or groundwater exposure pathways, determine appropriate protective concentrations levels, and establish response objectives for protection of human health and the environment.

Florida Risk Management Policy Study. Directed a comprehensive fate-and-transport modeling study, risk evaluation, remedy selection and remedial action costing study for 117 remediation sites to assess the cost impact of proposed regulatory policies on the state reimbursement fund.

Michigan Site Prioritization Study. Performed baseline risk classification and time-to-impact evaluations for 270 remediation sites in Michigan to support prioritization of response actions.

Risk Management/Regulatory Policy Initiatives (continued)

New Jersey Modeling Guideline for Alternative Soil Cleanup Criteria. On behalf of New Jersey Department of Environmental Protection, conducted detailed technical evaluation of six soil-to-groundwater leachate transport models and developed step-by-step instructional manual for use of SESOIL chemical transport model to derive alternative soil cleanup levels for groundwater protection.

Iowa RBCA Cost Study. Conducted detailed risk characterization and remedial action costing study for 120 remediation sites in Iowa to assess the cost impact of the newly proposed state Risk-Based Corrective Action (RBCA) regulatory program.

Wisconsin RBCA Implementability Study. Conducted a detailed regulatory analysis and case study evaluation to assess the performance of Wisconsin corrective action regulations with respect to key risk management objectives.

TNRCC Groundwater Compliance Plan Application Update, Texas Natural Resource Conservation Commission (TNRCC), State of Texas. Participated in the revision of the Groundwater Compliance Plan Application and Modification Procedures establishing groundwater protection requirements relating to compliance monitoring and corrective action program at permitted and solid waste management units. Summarized key regulatory requirements and the procedures for applying for a groundwater compliance plan in an easy-to-follow format. Presided in discussions with the TNRCC staff and regulated community to identify the minimum information required for application submittal.

GSI User's Guide to State of Texas Risk Reduction Rules, Groundwater Services, Inc., Houston, Texas. Authored publication outlining step-by-step procedures for compliance with the Texas Risk Reduction Rules.

Development of Remediation by Natural Attenuation (RNA) Training Materials, American Society of Testing Materials (ASTM). Assisted ASTM RNA Task Group in development of national professional training curriculum regarding collection and interpretation of field and laboratory data for evaluation of groundwater natural attenuation processes.

Development of Tier 2 Risk-Based Corrective Action (RBCA) Training Materials, American Society for Testing and Materials (ASTM). Developed guidance document and accompanying software system for assisting users with the ASTM Tier 2 RBCA process, including chemical fate-and-transport modeling for air, soil, and groundwater; exposure assessment and risk characterization, derivation of risk-based cleanup targets, and remedy selection. Interacted with ASTM committee members to ensure compatibility between Tier 1 and Tier 2 guidance manuals and software tools.

Development of Risk-Based Corrective Action (RBCA) Software Tools, Texas Natural Resource Conservation Commission (TNRCC), State of Texas. Developed software systems for assisting state environmental regulators in applying RBCA guidelines to evaluate the appropriate corrective measures for underground storage tank and hazardous waste releases. spreadsheet-based software systems meet risk evaluation requirements of TNRCC Industrial and Hazardous Waste and Petroleum Storage Tank Divisions and include comprehensive set of 12 fate-and-transport models for air, soil, and groundwater, as well as chemical/toxicological database and risk characterization tools.

Oil and Gas Facilities

Practical Guidelines for Roadspreading of E&P Wastes. Co-author of technical guidance document outlining appropriate procedures for waste minimization by roadspreading of non-hazardous E&P waste solids (drill cuttings, tank bottoms, etc.), addressing both environmental and geotechnical design criteria and construction specifications for earthen roads.

Brine Spill Remediation Guide, American Petroleum Institute. Co-author of peer-reviewed guidance document "Strategies for Addressing Salt Impacts of Produced Water Releases to Plants, Soils, and Groundwater," which outlines procedures for assessment and response to releases of produced water from oil and gas exploration and production operations.

Environmental Remediation Audit, La Cira Oilfield, Colombia. Environmental inspection of over 100 oilfield installations in La Cira oilfield to identify environmental liabilities, and develop probabilistic analysis of associated risks to human health, natural resources, and development plans, as well as appropriate remediation strategies and associated costs, for use in long-term oilfield privatization and redevelopment program.

Oil and Gas Facilities (continued)

Environmental Investigations, Oil Exploration and Production Properties, Oriente Region, Ecuador. Conducted environmental investigations regarding remedial actions and alleged human health and environmental impacts associated with former oil and gas operations at 122 oil exploration and production properties located in the Oriente Region of Ecuador.

Natural Gas Processing Plant Remediation Program, Risk-based evaluations of six natural gas processing facilities in Texas, Oklahoma, and New Mexico to evaluate chemical fate and transport, assess potential exposure concerns, identify appropriate response actions for affected soil and groundwater.

Oil and Gas Property Impact Assessments, Evaluation of two West Texas ranch properties to quantify alleged resource damages and remediation costs associated with oil and gas exploration and production activities.

Oil and Gas Property Remediation Study, South Texas. Site investigation, fate and transport analysis, and development of remedial measures to address historical impacts in coastal wetlands area.

Compliance Auditing, Multiple Oil and Gas Production and Distribution Facilities, Various U.S. States and Canada. Assisted major oil and gas production company with internal environmental, safety, and health compliance audit program. Participated in several one-week visits to facilities involved in mining and petroleum production, storage, and distribution, focusing on facility compliance in the areas of hazardous and solid waste management, underground storage tanks, water pollution, air pollution, spill control, and loss prevention.

Salt Water Impact Studies, Multiple Exploration and Production Facilities, Texas and Oklahoma. Evaluated brine impacts on groundwater and surface water resources in oil and gas production areas to define probable sources (salt water disposal pits, waterflooding, injection wells, etc.), based on historical trend analyses and fate-and-transport modeling, and evaluate appropriate corrective action strategies.

Regulatory Permitting and Compliance

Preparation of Hazardous Waste Permit and Groundwater Compliance Plan Applications, Manufacturing and Oil and Gas Facilities, Texas. Prepared RCRA Part B permit and groundwater compliance plan application modifications for the establishment of corrective action programs to be implemented at former surface impoundment units to address contamination detected in shallow groundwater. Revised the applicable sections of the facility's permits to incorporate compliance monitoring procedures. Supervised installation and activation of the groundwater remediation system.

RCRA Permit Renewal Applications. Directed preparation of RBCA permit renewal applications for two major petrochemical manufacturing facilities in Texas Gulf Coast region.

Radioactive Materials License, Chemical Manufacturer, Gulf Coast Texas. Prepared documentation for a Radioactive Materials License (RML) subject to state and federal regulations to authorize on-site management and disposal of low-level radioactive waste associated with petrochemical manufacturing process .

Delay of Closure Application, Chemical Manufacturer, Gulf Coast Texas. Prepared documentation for a Class 2 RCRA Part B permit modification for conversion of hazardous waste surface impoundments to nonhazardous waste storage and treatment.

Regulatory Compliance Audits, Oilfield Facilities, U.S. and Canada. Conducted regulatory compliance audits for various oil and gas facilities in Texas, Louisiana, Utah, and Canada to evaluate compliance with applicable waste management, air emission, brine disposal, fire protection, SPCC, spill reporting, drinking water, TSCA, and other applicable state, federal, or provincial safety, health, or environmental regulations.
