BECKY L. JOHNSON, P.G.

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CAREER SUMMARY

Ms. Johnson established an environmental training and consulting firm, *Environmental Trainers, Inc.*, in June of 2001 as a certified woman-owned business dedicated to providing quality environmental services. That firm was sold after 13 years to Breitling Consulting. Ms. Johnson has almost 30 years' experience in domestic and international environmental management and is an experienced consultant, trainer, and auditor. Ms. Johnson's expertise is in complex subsurface investigations, voluntary cleanup programs/innocent operator programs (VCP/IOP), multi-media compliance audits, hydrogeology and groundwater resources, storm water permitting and compliance, pollution prevention, Phase I Environmental Site Assessments, underground storage tanks, asbestos surveys, and subsurface remediation. Ms. Johnson is an organized, results-oriented professional with proven strengths in program and project management, contract management, training and curriculum development.

EXPERTISE

- Environmental training
- Compliance auditing
- Subsurface characterization (soil & GW)
- Underground storage tanks (USTs)
- Sustainability
- Groundwater and surface water resources
- Asbestos
- Program Management
  - NextEra Wind Energy Initiative totaling $5M
  - TRWD IPL Project totaling $200,000
  - USPS contracts totaling $5M

SPECIAL APPOINTMENTS

- Texas Board of Professional Geoscientists, originally appointed by Governor Perry. 2011-2017. Re-appointed by Governor Abbott. 2017-2023.
- Chair – Texas Board of Professional Geoscientists. 2019-2021
- Texas Environmental Excellence Awards, Blue Ribbon Committee, appointed by Governor Abbott, 2015-1016.

REGISTRATIONS	EDUCATION
Professional Geologist #TN3611 since 1994 Texas # 827 since 2003 ISO14001 Lead Auditor since 2002 CAPM TX #00579 since 1995 Asbestos Management Planner Tx #20-5327 since 1996 Inspector since 1992 HAZWOPER & Supervisor 1992/1995 Confined Space Entry/Rescue 1996	M.S. Environmental Science, Texas Christian University 1995 B.S. Geology University of Texas, Arlington 1985

RESEARCH

General Services Administration – Green Proving Ground:
Partnership between TCU Environmental Science and General Services Administration (GSA) Sustainability Group within their national Green Proving Ground Program. GSA is the leader in sustainable solutions for the built environment, managing the largest portfolio of buildings in the country. To date, three students have completed projects for GSA:

- MagLev chiller project: two students have researched the energy consumption and water consumption of a new type of HVAC system that uses a magnetic levitation chiller. Results indicated that these new chillers can save as much as 40% on energy costs and can create significant water savings (at the utility). GSA experienced energy reductions and savings from the first full year of MagLev Chiller conversions total 4,844,563 kWh and $400,267.46 and an estimated water savings of 460,233,485 L — 2016 - pres
- Sustainable Landscapes Project: one student researched data for 12 buildings within GSA's Greater Southwest Region (New Mexico, Texas, Oklahoma, Arkansas, and Louisiana) including total site size, building square footage, building occupancy and number of daily visitors, water usage, and climate and rainfall to better understand building performance/ water usage for properties with both high performance and low performance landscapes. The results indicate that building occupancy/number of visitors is the largest control on water usage due to the amount of HVAC required for climate control.

Tar Creek Superfund Site: Analysis of EPA's Mandated Soil Amendments
Masters thesis research (Chair) - The former Tri-State Mining District (TSMD) of Missouri, Kansas, and Oklahoma operated large subsurface mines for lead and zinc from 1914 until the mid-1950s. Ore processing left behind roughly 500 million tons of chat that remains in stockpiles up to 200 feet tall. The stockpiles have adversely impacted the area, resulting in high concentrations of lead (Pb), zinc (Zn), and cadmium (Cd) in the soil and water systems. EPA has developed a process whereby the chat piles are removed, and soil amendments are applied to contaminated soil to bind the metals and prevent uptake by plants. These amendments preserve topsoil, keep the land in productivity, and hopefully limit the potential for humans and livestock to ingest metals via the food chain. Results indicate successful sequestration of lead and cadmium, but additional research is needed. — 2016-2018

Tarrant Regional Water District – Dallas Water Utilities Project:
Faculty and student research on the socio-economic implications of constructing a new raw water pipeline for north central Texas. This 2-year, $175,000 research focused on the environmental and economic impacts of construction as well as the economic losses associated with not building the project and failing to secure additional water resources for the region. Completed a major white paper and two international presentations on research results. — 2013 - 2016

Texas Christian University – Oxford – NextEra Energy Initiative:
Faculty and student research on renewable (wind) energy, with a focus on environmental, social, economic and carbon implications of wind power development. Five-year, $3.2 million research initiative. Responsible for 6 years of socio-economic modeling of wind power development in Texas, Oklahoma, Iowa, and Kansas. Published 3 papers and gave 6 major conference presentations on research results. — 2008 - 2014

Groundwater Degradation and Sustainability of the Erbil Basin Erbil, Kurdistan Region, Iraq
Masters thesis research - Erbil Province is the fourth largest province, located in northern Iraq, covers an area of 15,074 km2 (3.5% of Iraq), and is one of the most important agricultural regions in Iraq. The area is dominated by intensive irrigated agriculture, and surface water sources are typically unusable for human consumption. Water tables have declined 6 to 10 meters in the last 10 years due to overpumping. Groundwater usage was determined to be unsustainable and should be reduced by 85% to reach stabilize the water table. These data were presented to the Iraqi government for implementation of new groundwater restrictions. — 2014

Texas Commission on Environmental Quality – Groundwater Supply in South Central Texas
TCEQ (Texas Commission on Environmental Quality) requested research assistance regarding a small municipality in south Texas that needed help with their groundwater supply. My groundwater — Fall 2011 - Summer 2012

hydrology class conducted a significant amount of research regarding the aquifers present, geology of the region, limitations for groundwater supply, and a cost evaluation for drilling new wells versus trucking in water. The students also completed aquifer modeling using Aqtesolve and Rockworks. TCEQ incorporated our work into a state guidance document for small water supply systems: "Management Guide for Small Utilities: Monitoring Your Source, Planning for Alternatives". *TCEQ* honored us with the *ENVIROMENTOR OF THE YEAR* award at the annual TCEQ Trade Fair in May 2012.

REPRESENTATIVE PROJECT AREAS

PROGRAM MANAGEMENT

- USPS contracts totaling $5M
- Unocal Truckstop program totaling $250,000
- MCI Telecommunications Phase I program totaling $112,000
- Starbucks expansion throughout Texas

RISK BASED SITE CLOSURES/SUBSURFACE INVESTIGATIONS

- USTs throughout US
- Sludge lagoon closure
- VCP/IOP site characterization and closure
- Pump and slug testing of wells
- Landfill permit applications

COMPLIANCE

- NEPA Environmental Assessments
- TWDB revolving loan and rural water systems grants
- Multimedia compliance audits
- Professor of Professional Practice at Texas Christian University for environmental compliance

EMERGENCY PLANNING

- Emergency response plans
- Program development and training
- Policy and procedures reviews
- SPCC and SWPPPs for chemical releases

ESAS

- Over 600 Phase I ESAs
- Portfolio ESAs
- Business risk ESAs including NEPA reviews
- Phase II ESAs including surface soil and water, subsurface soil, and groundwater characterization

STORM WATER

- Annual CSCE inspections
- Phase I & II permitting
- Construction permitting
- Storm water management plans

ASBESTOS

- Over 500 asbestos surveys

ASBESTOS

- Demolition/renovation surveys
- Abatement surveys
- Limited surveys
- Operations and maintenance programs
- AHERA protocol

LEAD

- Lead dust
- Lead paint
- Lead-in-water
- Wipe sampling
- Bulk sampling
- Drinking water sampling in accordance with EPA protocol

INDOOR AIR

- Surveys and sampling for complaint response
- Mercury spill/vapor response
- Mold sampling and remediation

TRAINING

- Environmental management systems
- HAZWOPER
- Confined space
- HazCom
- SPCC
- Asbestos
- Phase I and Phase II ESAs
- Water and wastewater treatment
- Environmental compliance

REPRESENTATIVE PROJECT DESCRIPTIONS

PROGRAM MANAGEMENT

Program Manager: Managed a series of property transaction **Phase I and Phase II ESAs** for the 2004–2006 Starbucks expansion program. Starbucks launched an aggressive expansion program, acquiring numerous sites throughout the state of Texas to build standalone facilities or small strip centers containing Starbucks "flagship" storefronts. Their program included the intentional purchase and remediation of former gasoline services stations. The program included fast-track review of existing Phase Is, completion of new Phase I ESAs, and Phase II ESAs for virtually every site to assess potential subsurface impacts of previous operations.

Program Manager: Responsible for adapting the company's U.S.-based **Environmental Management System (EMS)** to international (country-specific) areas of operation. Responsible for developing and conducting EMS classes for a major international oil drilling contractor. The classes include materials on hazardous waste identification and management; Hazard Communication, including DOT labeling and shipping requirements, and other environmental issues, such as asbestos, PCBs, and CFCs, as well as the company's country-specific environmental management systems. The project included obtaining

PROGRAM MANAGEMENT

regulations for each country of operation, researching the waste disposal and recycling options for each country, and adapting the EMS and course for each country of operation.

Program Manager: **U. S. Postal Service district contract**. Duties include client relations, business development, project management, billing and project execution. The range of projects for this client includes e**nvironmental compliance reviews, pollution prevention surveys, spill prevention (SPCC), storm water (NPDES) issues, underground storage tanks (USTs), asbestos and lead-based paint surveys, air emissions/permits**, and **program development** for USPS in accordance with applicable federal, state, and USPS guidelines.

Program Manager: Unocal Auto/Truckstop **underground storage tank program** for the southwest region of the country. Duties include investigation of all potential underground sources of hydrocarbons at truckstop facilities in accordance with state regulations, reporting/interface with state regulatory agencies, and oversight of remedial activities and storage tank removal. Facilities were located across the southwestern United States.

Program Manager: International telecommunications client. Duties include client interface, proposal writing, execution of projects across the nation, billing, and business development. Projects include **asbestos sampling, Phase I ESAs, preliminary environmental audit questionnaires, asbestos surveys, and subsurface investigations**.

RISK BASED SITE CLOSURES/SUBSURFACE INVESTIGATIONS

Project Manager: Completed **Municipal Setting Designation (MSD)** application within the City of Fort Worth for a former scrap metal reclamation facility. The application included a complex subsurface investigation, preparation of the documents required to obtain the MSD, preparation for public meetings and public hearings, and approval from the Fort Worth City Council for the project. Per the MSD, the site will be remediated to a commercial/industrial cleanup standard established by regulations but will not be required to comply with drinking water standards because the groundwater at the site is demonstrated to have no beneficial use. The MSD saves an estimated $1,000,000 in cleanup costs for site redevelopment.

Project Manager: Completed an **MSD** for a series of properties that include LaGrave Field (home of the Fort Worth Cats minor league baseball team), the former Technicoat facility, and the former Cytech (American Cyanamid) site. These properties are located in an area with documented historic contamination and with fuels and solvents present at low levels in shallow groundwater. The MSD was approved by the City of Fort Worth and TCEQ.

Project Manager: Subsurface investigation for former manufacturing facility located immediately north of downtown Fort Worth. The facility had subsurface impacts of solvents to shallow groundwater. The site was entered in the **TCEQ Voluntary Cleanup Program (VCP)** and long-term monitoring of shallow groundwater continues. TCEQ granted a certificate of completion for the site, and ETI received a letter of no further action in February 2009.

Project Manager: **Subsurface investigation** for an entire city block north of downtown Fort Worth. The block was previously developed with at least two gasoline service stations and various manufacturing operations. The investigation included installation of 10 borings/monitoring wells, with soils and groundwater sampling for various contaminants including TPH, VOCs, SVOCs, and total metals. The project indicated no subsurface impacts above the TCEQ cleanup standards at the time of the investigation.

Project Manager: Subsurface investigation for Unocal at a former chemical distribution facility. The previous consultant failed to identify an offsite plume migrating onto the site and commingling with the client's small release. The additional investigation revealed an offsite source for the offsite groundwater plume. Negotiations with adjacent property owners were required to determine the source of the second plume, eliminate the client's liability, and save the client millions of dollars in remedial expenses. The site was entered into the **TCEQ Voluntary Cleanup Program** for risk-based closure under RRS2.

Project and Field Manager: Subsurface investigation for a printed circuit board manufacturer for a real estate transaction. The investigation revealed substantial impacts to groundwater beneath the site and

RISK BASED SITE CLOSURES/SUBSURFACE INVESTIGATIONS

resulted in a negotiated lowering of the purchase price for the facility. The facility was subsequently entered into the **TCEQ Voluntary Cleanup Program (VCP)**, remediated and closed under RRS2.

Project and Field Manager: **Subsurface investigation** for Union Pacific Railroad consisted of soil borings and monitoring well installation at a railroad yard located along the Trinity River in Fort Worth, Texas. The investigation was designed to identify diesel and other hydrocarbon releases from a large railroad car refueling operation, closed sludge settling ponds, and storm water retention ponds which contained large quantities of fuels, oils, and sludges. Petroleum hydrocarbons were identified in soils and groundwater, including phase-separated hydrocarbons (PSH) on groundwater. The site was closed under RRS2.

Project Manager: **Brownfields investigation** for an approximately 35-acre former landfill located in Haltom City, Texas. The investigation included the installation of over 30 test pit excavations to determine the horizontal and vertical extent of the wastes, as well as 10 borings/monitoring wells to assess potential impacts to shallow groundwater. The City of Haltom City was preparing to purchase the property and identified the former landfill through a Phase I ESA. An **EPA brownfields grant** was obtained and used to finance the subsurface investigation for the facility. Based on the findings, the city estimated cleanup costs at over $3,000,000 and decided against purchasing the site.

Project Manager: **Brownfields investigation** for an approximately 15-acre former landfill located in Benbrook, Texas. The site is currently used as a city park and soccer fields and was identified when buried trash such as tires began to show through the soils cover at the site. A brownfields grant funded the investigation that included shallow borings with soil sampling, as well as surface water and sediment sampling for the adjacent creek. The investigation revealed impacts to soils, sediment, and surface water from the landfill, but impacts were below the TCEQ cleanup standards.

Project Manager: **Brownfields investigation** for an approximately 50-acre fill site in the City of Haltom City. The site was private property that had been excavated for sand and gravel during the 1970s. With a change in ownership in 1999, the excavated site had been backfilled with construction debris (according to the owner). The city was considering purchasing this property and conducted a subsurface investigation prior to the purchase that included 14 borings and soils sampling. The results confirmed the owner's assertion that backfilling was conducted with construction debris. However, significant amounts of road surfacing debris (such as asphalt) were identified within the fill, and the city decided not to purchase the site.

Project Manager: **Site characterization** for a manufacturing facility located on a major tributary of the Trinity River in Dallas, Texas. A subsurface investigation for suspected solvent releases near a former interior drum storage area revealed significant concentrations of solvents in shallow soils beneath the building foundation. Additional investigation delineated the horizontal and vertical extent of the solvent impacts to soils, with no impacted groundwater. The facility was entered into the **TCEQ Voluntary Cleanup Program (VCP)** and received a Certificate of Completion for Remedy Standard A approximately 45 days after submittal of the **Affected Property Assessment Report**.

Project Manager: **Site characterization** for a small industrial warehouse business park located in North Richland Hills, Texas involved in a real estate transaction. Both the subject site and the immediately adjacent site contained dry cleaners facilities with releases of percholorethene. The investigation included 20 soil borings with soil and groundwater sampling. Results indicated that a portion of the subject site was eligible for an Innocent Operator Program (IOP) Certificate for the groundwater impacted by the adjacent dry cleaners. The on-site dry cleaners site release was entered in the VCP and will likely achieve closure after additional groundwater monitoring.

Project Manager: **Subsurface investigation** of a former landfill located along the banks of the Colorado River, overlying a sole-source drinking water aquifer in central Texas. The investigation determined the approximate limits of the waste, depth to competent bedrock, groundwater flow characteristics, and possible contaminants from either the buried waste or landfill gas generated at the site. The investigation required interface with multiple regulatory agencies including TCEQ, Edwards Aquifer Protection Group, and **Barton Springs/Edwards Aquifer Conservation District**.

RISK BASED SITE CLOSURES/SUBSURFACE INVESTIGATIONS

Project Manager: Closure of **sludge lagoons** and sludge disposal landfill at Red River Army Depot. Duties included a review of existing documentation, a subsurface investigation, coordination with state and federal agencies, review of waste streams currently and formerly contributing to the site, excavation, and backfill of the lagoons.

AQUIFER CHARACTERIZATION AND TESTING

Field Manager: **Regional groundwater study** in Coahuila, Mexico for sole drinking water supply for city of 500,000. The study included research of geological, hydrogeological, vegetation, and precipitation data; analysis of well field information; field mapping; and reconnaissance, research, and development of 12 new prospect areas for groundwater supply. To date, drilling indicates 11 successful wells yielding large amounts of high quality water in two areas.

Field Manager: A**quifer characterization** and geological reports for several municipal and private landfills in accordance with Subtitle D regulations. Characterization included geological and hydrogeological site research, drilling/sampling of soils and rock, geophysical surveys, well installation/development, aquifer testing, interface with state officials, and technical testimony for public hearings.

Project Manager: Independent refinery **groundwater extraction system**. The project site experienced an approximate 5,000-barrel release from a high-pressure underground pipeline. Duties involved operations and maintenance of the groundwater extraction and treatment system, coordination with state and local agencies, and repairs and system changes to increase operating efficiencies.

Field Manager: **Aquifer characterization**, including design and implementation of aquifer testing programs to determine hydraulic conductivity, permeability, and transmissivity of the subsurface. These programs have included slug testing, pump testing, and packer testing and have also included methodology to characterize multiple aquifers beneath a site.

COMPLIANCE AUDITING AND ENVIRONMENTAL ASSESSMENT (NEPA)

Principal: Project oversight and quality control on environmental services including specification preparation, field sampling activities, and **NEPA** documentation for the removal and replacement of underground petroleum storage tanks at the Veterans Affairs (VA) Dallas and Bonham facilities.

Project Manager: **EAs** for four water treatment plant and pipeline expansions/constructions. The EAs were completed for various water supply corporations to evaluate the environmental consequences of the proposed project to l**and use, floodplains, wetlands, cultural resources, biological resources, water quality, coastal resources, and socioeconomic/environmental justice** issues. For each concern, the affected environment, environmental consequences, and mitigation were evaluated and discussed. These projects were conducted using funding from the **Texas Water Development Board Rural Water Supply Loan Program**, which included specific requirements and reporting outside the scope of a typical NEPA investigation.

Project Manager: **EA** for City of Fort Worth water treatment facility expansion and update to the city's master plan for water resources. The EAs were conducted for each of the three existing water treatment facilities with regard to future expansions in accordance with NEPA and federal grant monies requirements. In addition, potential sites for a future fourth water treatment facility were reviewed for a variety of environmental issues. The project included review of U.S. Geological Survey 7.5-minute topographical maps, Natural Resource Conservation Service s**oil surveys, national wetland inventory maps, and Texas Parks and Wildlife Department and U. S. Fish and Wildlife Service** county lists of endangered and threatened species. Outcomes included recommendations for permitting that may be required for future expansions, including sludge handling, air permits, 404 permitting, and wetlands mitigation.

Project Manager: **EA** for the City of Palestine wastewater collection system rehabilitation project. The project will be conducted in phases and includes piping replacement (using in-situ technologies), piping repair, and manhole replacement and repair. The project was funded through the **Texas Water Development Board's revolving loan program**, which imposed specific environmental investigation requirements above and beyond the scope of NEPA review. Overall, the project identified three areas

COMPLIANCE AUDITING AND ENVIRONMENTAL ASSESSMENT (NEPA)

requiring wetlands delineation and permitting through the Fort Worth District Corps of Engineers nationwide permits.

Project Manager: **Environmental review** for the City of Fort Worth for a new 48-inch water supply line being installed adjacent to the Trinity River. The proposed route for the pipeline runs through heavily industrialized areas, creating the potential for the generation of hazardous waste during excavation and installation. After the evaluation was complete, funding for the **Trinity River Vision Project** was awarded, which altered the route for the 48-inch supply line. Re-investigation for the new routing was conducted and identified a hazardous waste impact in the pathway of the pipeline.

Project Manager: **Compliance audit and site closure** for a printed circuit board manufacturing facility in Colorado Springs, Colorado. The facility had produced printed circuit boards for approximately 20 years in the same location, and the process included etching, metals plating, stripping, soldering, assembly, and wastewater pretreatment. Significant pitting and staining of concrete throughout the facility was indicative of potential releases to the subsurface, especially in the plating areas. Soil borings, monitoring wells, and concrete and wipe sampling indicated significantly lower concentrations of contaminants than anticipated. Impacted areas of the facility were cleaned or removed, confirmation sampling was conducted, and pits/sumps were filled with concrete. Permits including air, wastewater discharge, and RCRA hazardous waste generation were closed, and **EPA conducted a final inspection** of the facility prior to final closure.

Project and Field Manager: **Multimedia compliance audit** of a power cogeneration facility in Paris, Texas. The audit included federal and state environmental regulations and health and safety regulations, records review (including environmental permits, regulatory agency correspondence, violations, and corrective actions), site inspection, personnel interviews, and report of findings. This facility also had a steam host, providing excess steam to an adjacent industrial facility and accepting their return wastewater.

Project and Field Manager: Numerous **compliance inspections and pollution prevention studies** for U. S. Postal Service facilities, including processing and distribution centers and vehicle maintenance facilities. Compliance inspections included review of applicable federal and state regulations, as well as USPS internal policies for environmental issues and waste disposal. Up to 23 individual waste streams were evaluated for pollution prevention opportunities.

Task Manager: **EA/EIS** for a large, constant elevation, flood control reservoir in the City of Fort Worth. Sediment buildup behind the dam caused substantial impacts to aquatic plants and animals. The EA addressed potential options for sediment removal, including dredging and excavation after lowering lake levels. The EA identified several potential impacts, which required an EIS.

Task Manager: **EA** for the U. S. Postal Service for an expansion of their existing main Fort Worth handling facility. The EA included traffic and noise studies in addition to potential endangered species and wetlands issues.

Task Manager: **Multimedia compliance audit** of a large municipal water department. The audit included federal and state environmental regulations for all water department facilities throughout the city of 250,000 residents. In addition, the project included development of a training program for in-house personnel, classroom and field instruction for appropriate city employees, and follow-up review of auditing conducted by in-house personnel.

SUSTAINABILITY

Lead Faculty: Researched and developed the **Sustainability Certificate Program for TCU**. The program consists of 10 hours of coursework including concepts in environmental sustainability, environmental issues, and socioeconomic sustainability. The certificate program incorporates both an undergraduate and a graduate "track" and is specifically intended for students from all majors and backgrounds. It provides a foundation of soild science accompained by the social and economic contraints for today's decision-makers.

Lead Faculty: Developed an upper-level/graduate-level course, **"Concepts in Environmental Sustainability,"** as the introductory course for the new Sustainability Certificate Program at TCU. The

SUSTAINABILITY

course addresses the scientific issues faced by the planet today including c**limate change, population growth, air quality/pollution, carbon emissions and trading, water supply, U.S. and global environmental regulations, environmental management systems, and ISO14001**.

Lead Faculty: Developed a unique approach to meeting the challenge of sustainability and climate change for the TCU campus through a course called **"Chasing Carbon."** This course is student-led and addresses the challenges ahead of TCU in achieving climate neutrality. Students explore **renewable energy technologies, carbon offset and sequestration programs, green building concepts and LEED certification**, and public outreach/education opportunities. This course is the first of its kind in the DFW metroplex and serves as a model for other universities to involve their students in addressing the realities of sustainability. **TCU was awarded the 2009 Clean Air Champion award by the North Texas Clean Air Coalition for this program**.

Lead Faculty: As a result of TCU's signing of the American College and University President's Climate Commitment, TCU was required to develop a baseline **greenhouse gas (GHG) emissions inventory**. Using student workers, completed the GHG inventory for the entire campus, including electricity and natural gas consumption, emissions from student and faculty commuting (to and from campus), emissions from all faculty and student travel (including sports teams), and refrigerant/chemical usage for building/landscape maintenance. This report was published for TCU, as required by the agreement, at the AASHE website (http://www.aashe.org/).

Lead Faculty: Also as a result of TCU's signing of the American College and University President's Climate Commitment, TCU was required to develop a **draft action plan for achieving climate neutrality**. Using the GHG emissions report and other student workers, completed the Draft Action Plan that created the benchmark report for TCU. The Draft Action Plan was designed as a dynamic, evolving report that is continually updated with new data and projects for the campus. Once finalized, the Draft Action Plan will include the path for implementation of the technologies and resources identified through our research and a timeline for achieving each of the 15 requirements of the agreement.

Lead Faculty: Led a two-week **study abroad** trip for 16 students at the **University of Oxford** to study climate change and sustainability from the European perspective. This immersion course included in-depth evaluations of emerging conservation technologies, renewable energy technologies, implementation strategies, social justice case studies, and the economics of sustainability and climate change. TCU's partnership with the University of Oxford brings a global perspective to these issues and provides a unique educational experience for both students and faculty.

Lead Faculty: With student workers, **addressed the D- rating** that The College Sustainability Report Card (greenreportcard.org) showed for TCU's sustainability efforts. As is common, paperwork and communication were part of the poor score, and TCU had not sufficiently promoted the efforts it had undertaken for the last 10 years. Additionally, addressed the sustainability and green building initiatives that will continue to improve TCU's ratings. Lobbied successfully to have sustainability incorporated into the update to TCU's campus master plan for the first time in 2009. Green report card score **improved to a B-**.

Faculty: As graduate faculty, supervised numerous **graduate student thesis projects**, including projects on sustainable ecotourism, carbon cap-and-trade, renewable energy credits, green roof design using native Texas plants, deforestation, soils, and water issues.

Sustainability Coordinator for TCU: Recently appointed as the **faculty sustainability coordinator** for TCU for two regional sustainability councils in North Texas: Texas Regional Alliance for Campus Sustainability and the newly-formed Campus Sustainability Exchange. The first of these groups is focused on campus initiatives and student-led projects. The second is focused on bringing research opportunities to campus and forming partnerships with municipalities to address community sustainability.

EMERGENCY PLANNING

Project Staff: Completed **emergency response plans** for two City of Fort Worth water treatment facilities. The emergency response plan included identification of sensitive receptors within one mile of each facility; evacuation plans and routes for city employees; evaluation of the chemical hazards present;

EMERGENCY PLANNING

coordination with LEPC, Fort Worth Fire Department, and the contracted emergency response firm; warning systems; and initial emergency response actions and training. Coordination with state and local roadway officials, railroad officials, and river authorities was required.

Project Staff: Completed a **multimedia compliance audit** for the City of Arlington Water Utilities Department that included a **review of the HazMat response team policies** and procedures, emergency preparedness, SPCC and SWPPP plans, and general environmental compliance for the entire department.

Senior Staff: Developed and implemented the **DFW Airport SPCC plan and SWPPP** for airport-owned facilities spread over 29.8 square miles and four municipalities. Each of the plans required evaluation of airport-owned operations and review of tenant operations for over 300 tenants on airport property. Each operation was reviewed for potential chemical hazards to employees and for potential threats to the environment, should unintentional releases of either hazardous or non-hazardous materials occur.

UNDERGROUND AND ABOVEGROUND STORAGE TANK INVESTIGATIONS

Project Manager: Completed a **UST compliance audit** for the Veterans Affairs (VA) Dallas facility. The review included tanks used for vehicle fueling as well as diesel fuel for backup generators that had been upgraded in 1998 to meet TCEQ standards. Reviewed installation drawings, as-built plans/specifications, and performed a site visit to review actual installations. Also reviewed the VA's UST files to determine if appropriate recordkeeping was conducted.

Project Manager: Conducted a **subsurface investigation** for an existing UST used to store diesel fuel for a backup generator. Based on construction data, the tank was a 500-gallon, single wall steel tank with cathodic protection that would no longer be used. The subsurface investigation included the tank pit and associated piping and did not reveal any subsurface impacts. Prepared the specifications for the UST removal, assisted with removal contractor bidding, observed the tank removal, and collected soil samples for laboratory analysis in accordance with TCEQ requirements.

Project Manager: Took over consulting responsibilities for a site where the owner had previously removed a UST using a licensed contract and consultant, but the consultant failed to file the site closure and reimbursement paperwork. The previous consultant had identified subsurface impacts and had filed the project with the TCEQ. Conducted an additional round of groundwater sampling, performed a vapor survey, walking receptor survey, and completed the required **Plan A paperwork** for submittal to TCEQ. The site was **successfully closed**, with reimbursement.

Program Manager: Unocal Auto/Truckstop **UST program** for the southwest region of the United States. Duties include investigation of all potential underground sources of hydrocarbons at truckstop facilities in Oklahoma, Texas, and Kansas in accordance with state regulations; reporting/interface with state regulatory agencies; and oversight of remedial activities and storage tank removal. To date, four sites have been closed through the **TCEQ Voluntary Cleanup Program (VCP)**, one site has been closed through the **Oklahoma Corporation Commission (OCC)**, and one site has been closed through the **Kansas Department of Environmental Quality (DEQ)**.

Project Manager: **UST release** from an emergency generator storage tank at a large commercial building. The site was in negotiations to be purchased and remediation required coordination between buyer, seller, their respective attorneys and consultants, and TCEQ. The site obtained reimbursement and closure through the TCEQ **risk-based closure program** after remediation of the significantly impacted areas. Corrective measures were also identified and implemented to prevent further releases.

Project Manager: **UST investigation** for a former auto/truck stop and restaurant. The site contained five 20,000-gallon USTs and three large dispenser islands. Coordination with TCEQ field inspector, the municipal pollution control officer, and fire marshal was required to complete the UST removal. Impacts were identified, primarily along pipe chases and at dispensers. Significant impacts were excavated and treated on site. The site was closed under the **TCEQ risk-based program** for USTs.

Project Manager: **UST investigation** for a former convenience store and auto service facility located in the hospital district of Fort Worth. The site was a retail gas station for approximately 50 years and included service bays, an in-ground hydraulic lift and oil/water separator. Impacts were identified, in-ground

UNDERGROUND AND ABOVEGROUND STORAGE TANK INVESTIGATIONS

equipment and contaminated soils were removed, and the **site was close**d through the TCEQ risk-based program for USTs.

Project Manager: **Municipal fleet service center** identified a potential release while pier drilling for construction of a building addition at the facility. **Vapor monitoring** was conducted during pier drilling such that construction could continue while the facility was characterized and entered into the **TCEQ PST program** for risk-based closure. Additional drilling and soil sampling indicated impacts from numerous USTs at the facility that had migrated approximately 500 feet from the original points of release. The site **obtained reimbursement** and closure through the TCEQ PST program while the new building was under construction.

PHASE I ENVIRONMENTAL SITE ASSESSMENTS

Project and Field Manager: over **600 Phase I ESAs** for federal facilities, office/warehouse facilities, and undeveloped properties throughout the state, documenting environmental deficiencies of the sites utilizing historical information, regulatory compliance, and field investigations. Performed multiple asbestos, lead paint, and radon surveys, as well as NEPA reviews, in conjunction with Phase I ESAs.

Task Manager: **Phase I and Phase II ESAs and asbestos surveys** for the **Federal Aviation Administration** (**FAA**). These investigations included various occupied and unoccupied sites across Texas, New Mexico, and Louisiana. The Texas sites included the former Southwest Regional Office, which was formerly the world's first helium plant.

Task Manager: **Phase I ESAs, due diligence**, and engineering analysis studies at **more than 500 landfills**, transfer centers, recycling centers, hauling companies, and fleet services maintenance shops in over 25 states for the **Allied Waste/Laidlaw merger**. Data collection was successfully completed within 90 days and included site visits, regulatory database reviews, and surrounding property environmental regulatory history check.

STORM WATER/SURFACE WATER

Project Manager: Managed staff charged with generating a **Phase I Comprehensive Site Compliance Evaluation (CSCE)** and annual **SWP3s** for six **DART** vehicle maintenance facilities. The work included planning and coordination with the prime contractor, Malcolm Pirnie, and DART management; on-site investigations; regulatory compliance; liaising with state regulatory agencies; report writing; and document revisions for DART CSCE and SWP3 process. Each location included bus storage and maintenance or light rail car/engine storage and maintenance. Inspections and compliance inspection reports were fast-tracked and completed within five business days of the site visit to comply with DART internal deadlines and budget constraints. Corresponding SWP3s were completed within 10 business days and submitted for DART's internal review.

Project Manager: **Storm water permitting assistance** for a stone fabricator located in Dallas, Texas. The facility's SIC requires them to obtain a storm water permit; however, the facility was unaware of the requirement. During a routine inspection by the City of Dallas, the omission was identified and **several notices of violation (NOVs)** were issued for the facility. ETI completed the permit application for the facility and assisted the facility in obtaining a no exposure exclusion, which allows them to operate without sampling storm water, since all operations are conducted indoors with no threat to storm water quality.

Project Manager: Completed a **storm water permit application** and **SWP3** for a stone quarry in Austin, Texas under the **TCEQ EnviroMentor program**. The facility had recently changed ownership and the previous owner had not obtained a storm water permit as required by their SIC. The new ownership was visited by TCEQ and the omission was identified. ETI conducted a site visit, completed the permit application, and developed the SWP3 for the facility to bring them into compliance.

Project Manager: Performed **monthly surface water sampling** for numerous potential pollutants for a small creek in central Fort Worth. Monitored surface water quality and variations for 12 months. Parameters included coliform bacteria, residual chlorine, oil and grease, pH, conductivity, and surfactants. Results were compared to **Texas surface water quality standards**.

STORM WATER/SURFACE WATER

Project Manager: Performed **surface water quality sampling** to determine the reason for a **fish kill** at a private pond. Parameters included dissolved oxygen, residual chlorine, oil and grease, pH, conductivity, and surfactants. Observations and field measurements indicated extremely low dissolved oxygen; therefore, further testing was conducted to identify the reason for the low dissolved oxygen. Subsequent to testing, the facility experienced a large fire, during which the pond caught the majority of firefighting water runoff. Additional testing was performed to determine whether the water from the pond could be released from the site.

Senior Staff: Developed and implemented the **DFW Airport storm water program**, including the Phase I **SWP3**, annual **comprehensive site compliance evaluations** (CSCEs), *illicit discharge detection*, **construction storm water permits**, **best management practices** (BMPs), and good housekeeping practices. In addition, the airport routinely conducted public education and outreach regarding storm water issues for their tenants and airport-owned facilities spread over 29.8 square miles and four municipalities. Each of the plans required evaluation of airport-owned operations and **review of tenant operations** for over **300 tenants** on airport property. Each operation was reviewed for potential chemical hazards to employees and for potential threats to the environment, should unintentional releases of either hazardous or non-hazardous materials occur.

Project Manager: Completed numerous **construction storm water permits**, including **notices of intent** and **notices of termination** for various construction projects throughout the DFW metroplex. Projects have ranged from small housing developments to large scale industrial facilities.

Project Manager: Completed Phase I storm water annual c**omprehensive site compliance evaluations (CSCE) inspections** for over 20 U. S. Postal Service processing and distribution centers and vehicle maintenance facilities throughout the southern United States (primarily in **Texas, Oklahoma, and Florida**). Updated SWP3s for each facility and edited the USPS master storm water program based on field inspections and data gathering. The master program was also updated with state-specific requirements as necessary. Reviews included applicable state regulations, USPS internal policies regarding the prevention of pollution to storm water, pollution prevention measures, good housekeeping practices, and best management practices for each facility. Staff at each facility were trained on storm water issues, their site-specific SWP3, and BMPs.

ASBESTOS/LEAD/INDOOR AIR QUALITY

Principal: Responsible for the overall quality control and review of **comprehensive asbestos surveys**, l**ead-based paint surveys**, **hazardous materials inventories**, and specification documentation with Cater & Burgess (Jacobs)/Huitt Zollars, a Joint Venture for an Indefinite Delivery/Indefinite Quantity Architect Engineering Contract for Multidiscipline Design and Related Services to Support BRAC and Military Construction within the Southwestern Division and on a Limited Nationwide Basis.

Project Manager: **Renovation asbestos survey** for all **campus housing** at Texas A&M University, Commerce. Sampling was performed prior to an upgrade to existing fire alarm systems. Destructive sampling indicated asbestos-containing materials in wall textures throughout campus housing.

Task Manager: **Renovation asbestos survey** for **33 campus buildings** at Texas Women's University in Denton, Texas. A campus-wide asbestos survey program was initiated prior to planned renovations at the university. Sampling was conducted for campus housing after students were released for summer break to minimize potential exposure to asbestos fibers.

Task Manager: **Asbestos survey** for Terminal A at **DFW International Airport**. Conducted asbestos sampling over a three-day period for suspect materials throughout Terminal A, including secure and non-secure passenger areas, roof areas, and employee areas on the lower levels. The survey included special procedures for security, badging, and passenger safety.

Project Manager: **Comprehensive asbestos surveys** for five buildings owned by the City of Mineral Wells. Some facilities were operational and some were slated for demolition. ETI provided all equipment, lighting, and power sources for the demolition asbestos survey of one of the facilities. In addition, ETI marked each sample location for the mechanical rooms of operational facilities such that future repairs and maintenance could be conducted without further asbestos sampling.

ASBESTOS/LEAD/INDOOR AIR QUALITY

Project and Field Manager: Performed over **500 renovation and demolition asbestos surveys** for properties ranging from industrial facilities to retail or commercial properties. Surveys have included destructive bulk sampling for suspect asbestos-containing materials, development of scaled floor plans showing asbestos locations, reporting, and development of operations and maintenance plans to prevent the release of fibers from asbestos-containing materials.

Project Manager: **Demolition asbestos survey** for abandoned property containing a former residence and multiple commercial buildings slated for redevelopment by a major Fort Worth hospital. Destructive bulk sampling indicated the presence of significant amounts of asbestos-containing material requiring abatement prior to building demolition and site redevelopment.

Program Manager: International cardboard manufacturer who acquired 22 facilities throughout the United States. The project included development of **operations and maintenance programs** for facilities in **11 different states**, incorporating federal and state-specific requirements and coordinating asbestos personnel with appropriate licensing for each state.

Project Manager: **Asbestos surveys and abatement** of 10 Payless Cashways stores in North Texas. Surveys were performed in response to a notice of violation that Payless Cashways received for renovation activities without appropriate asbestos analysis. Survey results indicated that licensed abatement personnel were required to conduct some renovation activities.

Project and Field Manager: Sampling program for **lead dust contamination** at a printed circuit board assembly facility. The sample collection included wipe sampling of elevated surfaces throughout both the manufacturing and office/administration areas, using ladders and hydraulic lifts for access. Micro-vacuum samples of carpeted areas, as well as bulk samples of air handling equipment were included in the sampling event. The remedial phase of the project is expected to begin in the immediate future and will consist of lead dust abatement, asbestos abatement, and carpet removal to restore the facility to pre-occupation conditions.

Project Manager: **Lead-based paint** and **asbestos survey** for a commercial rubber manufacturing facility. The lead survey was performed using both **XRF** and bulk sampling techniques. The asbestos survey was performed in general accordance with AHERA protocols using destructive sampling. Results indicated that lead was present in some coatings, but at levels below published guidance and unlikely to cause **exposure above the PEL** for facility workers. Asbestos was present in pipe insulation, flooring, and some wall insulation materials.

Project and Field Manager: Performed **asbestos and lead paint surveys** for **25 houses** prior to demolition. The Fort Worth **Corps of Engineers** claimed an entire neighborhood that was subject to frequent flooding and relocated the entire neighborhood. The property was then converted to a municipal park that allowed excess flood storage capacity. Prior to demolition of the housing addition, all suspect materials in each house were sampled for asbestos content, paint on exterior and interior surfaces was bulk sampled for lead content, and **soils** immediately surrounding each house were sampled for **total lead** (suspected source was painting and renovation of house exteriors).

Project and Field Manager: **Indoor air quality surveys for mercury** exposure at two Arlington, Texas **public schools**. Both incidents involved accidental release of elemental mercury during school hours in classrooms with students present. Response included notification of appropriate state and local officials, confinement/containment of release, inspection of students and personal belongings for traces of mercury, spill cleanup, and final clearance.

Senior Staff: **Indoor air quality management plan** for the **University of Texas at Arlington**. Project included identification of functional areas, interviews with university personnel for each functional area, review of complaint histories, product usage, and development of a management plan to minimize or eliminate IAQ complaints, problems, and issues. The project also included a system to receive, track, and document IAQ complaints.

Project Manager: **Indoor air quality** problem resulting in **significant employee illness** at a refrigeration unit manufacturer, Traulsen, located in Fort Worth, Texas. Employees in the same general office area became seriously ill with no apparent cause. Employee symptoms were consistent with pesticide exposure. Investigation revealed that the contracted pest management firm had treated landscaping

ASBESTOS/LEAD/INDOOR AIR QUALITY

on the day illness began. Further, a missing gasket on a window in the office area resulted in the pesticide treatment entering the office area and causing the employee illness.

Project Manager: **Indoor air quality complaint** from a tenant regarding visible black mold growth in a Dallas office building. The project included sampling of **visible black mold** and laboratory analysis to identify the genus and species. Results indicated **dormant Stachybotrys** which had developed due to a substantial roof leak in the building. The roof leak was repaired, contaminated building materials were removed, underlying structure was treated with anti-fungal agents, and building finishes were restored without further complaint.

TRAINING/TEACHING/SPEAKING

Instructor/Curriculum Development: **HAZWOPER** (Hazardous Waste Operations and Emergency Response). Specialized training for **Trinity River Authority**. Standard HAZWOPER training was modified and adapted for functions associated with water and wastewater treatment specifically for TRA operations throughout Texas. Training included **8-hour** emergency response (operations level), 24-hour emergency response (technician level) and **40-hour** hazardous waste operations.

Instructor/Curriculum Development: **HAZWOPER** (Hazardous Waste Operations and Emergency Response). Specialized training for **North Texas Tollway Authority**. Standard HAZWOPER training was modified and adapted for functions associated with highway incidents and vehicle maintenance operations specifically for NTTA operations. Training included **8-hour emergency response** (operations level), and **24-hour emergency response** (technician level).

Instructor/Curriculum Development: **Pesticide Management.** Specialized training for **North Texas Tollway Authority** staff who handle and apply pesticides. Topics included the physical and chemical hazards of pesticides being applied, personal protective equipment, and the fate and transport of specific pesticides. Training included handling, application, disposal, and emergency procedures in the event of exposure.

Instructor/Curriculum Development: **Confined Space Entry** Annual Practice Exercise, **Bell Helicopter** (Fort Worth). Responsible for development and instruction of a 4-hour confined space practice entry and rescue course in accordance with **29 CFR 1910.146**. This course is a 4-hour practice drill developed specifically for the in-house fire rescue squad that performs confined space entry rescues at Bell's Fort Worth facilities. The course includes a different scenario, rescue equipment, and chemical exposure and is performed each year in a different facility such that all members of the fire rescue quad are adequately trained for entry and rescue at any of the metroplex facilities.

Instructor/Curriculum Development: **Storm Water Pollution Prevention for Municipalities.** Developed MS4-specific curriculum regarding adult learning techniques for a storm water "train the trainer" symposium conducted by the **North Central Texas Council of Governments (COG)**. The symposium was targeted at Phase II MS4s who must be permitted under NPDES/TPDES. The training consisted of six storm water modules with additional emphasis on train-the-trainer and adult learning issues. In addition, created two interactive games to be used while training entitled "What's Wrong with This Picture" and "Storm Survivor". These games were incorporated into the curriculum available from the COG website for storm water compliance. Attended by over 40 municipal representatives from 30 cities.

Instructor/Curriculum Development: **Storm Water MS4 Inspectors Workshop**. Developed curriculum regarding MS4 inspections for a symposium conducted by the **North Central Texas Council of Governments (COG)** at Dallas Love Field. The training consisted of an overview of MS4 regulations, general inspection practices, how to work with industries, and how to evaluate the effectiveness of an MS4 inspection program. Attended by over 60 municipality and industry representatives.

Instructor/Curriculum Development: **Environmental Management Systems, Worldwide**. Responsible for developing and conducting classes for a major international oil drilling contractor. The classes include materials on hazardous waste identification and management; hazard communication, including DOT labeling and shipping requirements; and other environmental issues such as asbestos, PCBs, and CFCs. Classes have been taught in **Houston (Texas), Venezuela, Azerbaijan, and Nova Scotia**. One class taught in Houston was specific to the rules and regulations for **Australia**.

TRAINING/TEACHING/SPEAKING

Instructor/Curriculum Development: **Confined Space Entry Training**, **United States Marine Corps, Barstow, California**. Responsible for development and instruction of a 16-hour confined space entry course in accordance with **29 CFR 1910.146**. This course includes a 4-hour, practical application exercise where each participant had the opportunity to practice the skills learned in the classroom through an actual permit-required confined space entry.

Instructor/Curriculum Development: **Hazard Communication (29CFR1910.1200)** for a major pressure vessel manufacturer. The course included a one-hour HazCom refresher for over 60 factory workers (conducted in three separate sessions of 20 workers each) and an expanded course with spill response training for supervisors.

Instructor/Curriculum Development: **Spill Prevention, Control, and Countermeasures (SPCC)** training for Tarrant County College maintenance and engineering staff. The course was developed using the existing SPCC plans for each of four campuses to generate a campus-specific training program. Included in the project was a "train the trainer" component that allows TCC staff to train newly hired employees regarding SPCC. This 1.5-hour course included over 50 workers, supervisors, and managers at four campuses.

Instructor/Curriculum Development: **HAZWOPER** (Hazardous Waste Operations and Emergency Response), University of Texas at Arlington Southwest Environmental Education and Training Center. HAZWOPER training program under 29 CFR 1910.120. Responsible for developing and delivering effective hazardous waste operations and emergency response training for the UTA training program, including regulations from USEPA, DOT, and OSHA regarding hazardous materials and hazardous wastes.

Instructor/Curriculum Development: **Asbestos Courses**, University of Texas at Arlington Southwest Environmental Education and Training Center. Asbestos awareness, asbestos inspector, asbestos inspector refresher, asbestos management planner, and asbestos management planner refresher courses.

Instructor/Curriculum Development: **HAZWOPER**. Clients include: Bell Helicopter/Textron, Baylor Health Care, DFW International Airport, and numerous large consulting firms. ETI has been conducting 40-hour Hazardous Waste Operations and Emergency Response (HAZWOPER) training in accordance with **29 CFR 1910.120** since 2001. In addition, ETI conducts annual 8-hour HAZWOPER refresher training. Both of these courses are conducted in accordance with the Occupational Safety and Health Administration (OSHA) requirements under 29 CFR 1910.120. The course content includes an overview of the 29 CFR 1910.120 regulations, placarding and labeling systems, chemical hazards, and personal protective equipment. In addition, the course covers related regulations such as HazCom (**29 CFR 1910.1200**), respiratory protection (**29 CFR 1910.134**), and an overview of confined spaces (**29 CFR 1910.146**).

Instructor/Curriculum Development: **Water Well Drillers Continuing Education Courses**. Conducted 2-hour and 4-hour continuing education courses for licensed water well drillers in the state of Texas. Drillers are required to complete four hours of continuing education each year to maintain their licensing.

Instructor/Curriculum Development: **Confined Space Entry**, **DFW International Airport**. Conducted confined space courses in accordance with 29 CFR 1910.146 that are specially tailored to the DFW Airport requirements since 2003. The course includes a 4-hour "hands-on" entry using DFW's permit system.

Instructor/Curriculum Development: **New Asbestos Rules and Their Impact on Municipalities**, **North Central Texas Council of Government Regional Training Center**. Significant changes in the Texas asbestos rules occurred on January 1, 2002 that impacted all municipalities in the state. This 4-hour course was specially designed to make municipalities aware of their new responsibilities under the updated regulations and was attended by more than 40 individuals from over 30 municipalities in the north central Texas area.

Curriculum Development: Developed an **environmental experiment curriculum** for use **in elementary schools** throughout the Fort Worth Independent School District (FWISD) in conjunction with a local non-profit organization. The curriculum, which covers air, water, waste, and recycling, is intended to give teachers hands-on experiments and activities for their fifth grade students that will teach them the value

TRAINING/TEACHING/SPEAKING

of preserving our environment. In addition, the curriculum has been purchased by some surrounding municipalities for use in their respective school districts.

Professor: Texas Christian University, **Environmental Compliance**. Teaches the basics of environmental compliance, including the U.S. environmental regulatory framework, federal versus state or local regulatory agency authority, basic permitting processes, and the fundamentals of compliance auditing. Students have the opportunity to apply the knowledge they gain to real-life situations throughout the class and conduct a mock compliance audit for an actual facility at the close of the class.

Professor: Texas Christian University, **Phase I and II Environmental Site Assessment**. Teaches the basics of Phase I and Phase II Environmental Site Assessments including performing environmental site assessments, the environmental regulatory framework, and the fundamentals of site investigation. Students conduct a mock Phase I ESA as a part of the course.

Professor: Texas Christian University, **Water and Wastewater Treatment Technology**. Teaches the basics of water and wastewater treatment technology, including the regulations affecting water and wastewater treatment, storm water and its relationship to water and wastewater, and industrial pretreatment programs. Students tour water, wastewater, and industrial pretreatment facilities as a part of the course.

Professor: Texas Christian University, **Environmental Impact Statements**. Teaches the basics of Environmental Impact Statements and the NEPA process, including evaluating federally-funded development projects for impacts to the environment, categorical exclusions, environmental assessments (EA), and environmental impact statements (EIS).

Professor: Texas Christian University, **Environmental Management Systems**. Provides an overview of environmental management systems (EMS), how EMS can support environmental improvements at facilities that are subject to environmental regulations, and how an EMS allows an organization to systematically manage its environmental and health safety matters. Students will also understand the state and federal requirements for an EMS and how an EMS compares with ISO14001 certification.

Professor: Texas Christian University, **Groundwater Hydrogeology**. Teaches the basics of groundwater hydrogeology including the hydrologic cycle, aquifers, groundwater flow, groundwater recharge, water chemistry, and groundwater contamination. Provides an understanding of the relationship between surface water and groundwater, groundwater protection, field methods, and groundwater development.

Professor: Texas Christian University, **Environmental Sustainability**. Provides an overview of the issues facing a rapidly expanding global population, including, resource consumption, (water, waste, energy, food, & pollution). Provides students an opportunity to conduct research, completing a consumptive life cycle in a 3000-word paper, and presenting the life cycle analysis to their peers. This course also introduces the concepts of return on investment (ROI) and building a financial case for sustainability.

Professor: Texas Christian University, **Chasing Carbon**. TCU's first efforts to comply with the American College & University Presidents Climate Change Commitment agreement striving to make TCU carbon neutral. Projects in the first semester included: carbon offset program evaluations, baseline greenhouse gas emissions inventory, plan to incorporate sustainability into the curriculum for all TCU students, and develop the Draft Action Plan for meeting future requirements.

Professor: Texas Christian University, **Applied Projects Partnership Program** is new concept in academia - bringing "real-world" projects from industry to our students prior to graduation. Hands-on practical application of the classroom principles significantly enhances the student's learning and retention, creating graduates that are more prepared to enter the workforce. Projects include 1) Stormwater management plan for the City of Bedford, 2) GHG Emissions Inventory for TCU, 3) Draft Action Plan for TCU, and Green Roof research for BRIT.

Speaker: "Comparison of Socioeconomic Implications of the Wind Industry in Texas, Iowa and Kansas", American Association of University Women (AAUW) meeting, Texas, 2014

Speaker: "Comparison of Socioeconomic Implications of the Wind Industry in Texas and Iowa", Association of American Geographers Annual Meeting, Washington D.C., 2011

Speaker: "Socioeconomic Implications of the Wind Industry in Texas: A Case Study of Nolan and Taylor Counties", Association of American Geographers Annual Meeting, Washington, 2010

TRAINING/TEACHING/SPEAKING

Host: City of Fort Worth Environmental Excellence awards ceremony in Nov 2018. This was the 20th annual event where Tarrant County companies' environmental excellence is recognized and rewarded.

Speaker: Ethics in Geoscience Presentation for Association of Engineering Geologists - created a face-to-face ethics training class for the DFW chapter of AEG and gave the presentation in Feb 2018. This course serves as 1 hour of continuing education in ethics as required by the Texas Board of Professional Geoscientists each year.

Speaker: Ethics in Geoscience, Texas Board of Professional Geoscientists - created a 1-hour ethics course for TBPG and turned it into a video (.mp4 file) that has been posted to the TBPG website. This video serves as the required 1 hour of annual ethics training for over 5000 P.G.s in the state of Texas.

Speaker: Is North Texas Water Really Safe? Given at three different meetings: STEP - Dallas chapter, STEP Fort Worth chapter, and SESHA - Dallas (an ESH organization for semiconductor and high tech). After a firestorm of controversy about the safety of drinking water in north Texas, I took on Erin Brockovich and her deceptive public commentary about the use of chlorine and ammonia in our drinking water systems.

Speaker: "Socio-economic Impact of Wind Farms in Sterling and Coke Counties, Texas", Association of American Geographers Annual Meeting, Nevada, 2009

Keynote speaker: Golden Kiwanis and PEO clubs in FW on sustainability, 2009.

Keynote speaker: CPCU continuing education conference for insurance industry, 2009.

Keynote speaker: Harris Method hospital's Going Green conference in Fort Worth Texas during May, 2009. Over 100 attendees present for this convention.

Keynote speaker: League of Women Voters 11th Annual Environmental Awareness Awards ceremony at the state-wide convention held in Fort Worth Texas during April, 2008. Over 200 attendees present for this convention.

Speaker: **Continuous Improvement Process** training instructor. Emcon, Inc.

Speaker: **Catastrophic Recharge Events Affecting a Karstic Aquifer**. Sierra Madre Oriental Saltillo, Coahuila, Mexico. Geological Society of America, south-Central Section Meeting, Austin* (*Monetary award for best presentation.)

Speaker: **Water Infrastructure Study**, Saltillo, Coahuila, Mexico. ASCE Conference, San Antonio, Texas.

Instructor/Curriculum Development: **Compliance Audit Training**. Segments on USTs, hazardous waste, spill prevention (SPCC), polychlorinated bi-phenyls, and confined space. City of Arlington.

Instructor/Curriculum Development: **Field Sampling Technician** Course. Applicable regulations, sampling plans, site safety plans, chemical analyses, sample collection, and field documentation.

Instructor/Curriculum Development: **Environmental Regulations** Conference. Underground Storage Tanks for Executive Enterprises.

MINING FACILITIES EXPERIENCE

Project manager: Multiple subsurface investigations for surface aggregate mining operations. Studies included assessment of potential adverse impacts from petroleum storage tanks, vehicle wash-out facilities, and vehicle maintenance facilities.

Project manager: Environmental compliance gap analysis for Chemical Lime facilities across the United States. The project included review of existing environmental permits and notices of violation and application of OSHA, EPA, MSHA, and state regulations to determine the compliance framework for each facility.

CONTINUING EDUCATION

Intentional Dialogue workshop	2018
Strengths Deployment workshop	2018
Stratfor Workshop on geopolitics	2018

Learning to Teach Online course	2018-2019
Diversity in the Classroom workshop	2018
Safe Zone Training	2017
Gordon Cook Conversations	2012
Crucial Conversations workshop	2012
Contaminant Forensics (Northwest Environmental Training Center)	September 2008
Coaching and Leadership Workshop	2006
Environmental Management Systems (U.S. E.P.A.)	November 2003
Hydrogeology (Texas A&M University Education Extension Service)	January 2003
Confined Space Competent Person - Shipping (Marine) Industry Standard	December 2002
ISO14001 Lead Auditor Certification (AQS Management Systems)	October 2002
Texas Risk Reduction Program (TRRP) by TCEQ	February 2000
Confined Space Entry and Rescue (Eagle) - General Industry Standard	March 1999
Pollution Prevention Workshop (TCEQ)	November 1998
Continuous Improvement – Train The Trainer (Richard Rogers Group)	January 1998
Continuous Improvement Process	April 1997
Risk Assessment (API)	March 1997
Site Safety Supervisor (UTA)	November 1995
IBM PC Applications In Groundwater Pollution And Hydrology (NGWA)	August 1994
Migration, Assessment & Remediation Of Non-Aqueous Phase Liquids (NGWA)	June 1994
Achieving Compliance With OSHA's Lead Standard (IHST)	March 1994
Asbestos Management Planner Certification (UTA)	August 1994
Characterization Of A Multiaquifer System (Env. Edu. Enterprises)	June 1993
Hazardous Waste Operations Training (HAZWOPER)	August 1992
Hazardous Waste Seminar (TWC)	March 1991
Asbestos Inspector Certification	June 1991
Dispersion Modeling (Trinity Consultants)	Fall 1990

PUBLICATIONS AND PRESENTATIONS

Energy and Renewables, Humanists of Fort Worth	June 2017
Evaluating the Impacts to Lake Palestine from the IPL Project, City of Dallas	April 2017
"Resourcing Future Generations: Economic Impacts from Construction of a Raw Water Pipeline", 35th International Geological Congress.	August 2016
"Using GIS to Evaluate Lake Palestine and Potential Impacts of Raw Water Withdrawal for an Expanding Population", 35th International Geological Congress.	August 2016
"Comparison of Socioeconomic Implications of the Wind Industry in Texas, Iowa and Kansas", American Association of University Women (AAUW) meeting.	January 2014
Johnson, B. and Slattery, M. "The Socio-economic Impact of the Minco Wind Energy Center in Canadian, Caddo, and Grady Counties, Oklahoma" NextEra Energy Resources,	December 2012.
"PUBLIC PERCEPTIONS OF LARGE WIND FARMS IN TEXAS AND IOWA." Michael Slattery, Becky Johnson, Jeffery Swofford, Martin Pasqualetti. Published in print: Journal of Renewable and Sustainable Energy Volume 16, Issue 6.	August 2012
Johnson, B. and Slattery, M. "The Socio-economic Impact of Wind Farms - a Comparison of Texas and Iowa" NextEra Energy Resources,	February 2012
"STATE AND LOCAL ECONOMIC IMPACTS FROM WIND ENERGY PROJECTS IN TEXAS: Texas Case Study." Michael Slattery, Becky Johnson, Eric Lantz (NREL) Published in print: Energy Policy Volume 39, Issue 12.	December 2011

Johnson, B. "Comparison of Socioeconomic Implications of the Wind Industry in Texas and Iowa", Association of American Geographers Annual Meeting, Washington D.C.	2011
Lantz, E., Johnson, B. and Slattery, M. "Economic impacts of large-scale wind farm development at the County and State Level: A Texas Case Study, Association of American Geographers Annual Meeting, Seattle, April 2011.	2011
Lantz, E., Johnson, B. and Slattery, M. "Economic impacts of large-scale wind farm development at the County and State Level: A Texas Case Study <http://meridian.aag.org/callforpapers/program/AbstractDetail.cfm?AbstractID=38756> ",	2011
Johnson, B., Slattery, M.C. and Llado, L. "Comparison of Socioeconomic Implications of the Wind Industry in Texas and Iowa: A Case Study, Association of American Geographers Annual Meeting, Seattle.	April 2011
Johnson, B., Slattery, M.C. and Llado, L. "Comparison of Socioeconomic Implications of the Wind Industry in Texas and Iowa: A Case Study <http://meridian.aag.org/callforpapers/program/AbstractDetail.cfm?AbstractID=39134> ",	2011
Johnson, B. "Socioeconomic Implications of the Wind Industry in Texas: A Case Study of Nolan and Taylor Counties", Association of American Geographers Annual Meeting.	2010
Johnson, B. 2009 "Socio-economic Impact of Wind Farms in Sterling and Coke Counties, Texas", Association of American Geographers Annual Meeting, Nevada, 2009.	2009
Environmental Issues in Oil Exploration - Desk and Derrick Club	August 2002
Confined Space Entry and Rescue, 16 hours	2002-Present
Water Well Driller Refresher Course , 8 hours	2002-Present
"What New Asbestos Rules?" , article in BOMA Fort Worth Magazine	August 2002
Hazardous Waste and Emergency Response Operations (HAZWOPER) 8-hr Refresher Course	2001-Present
Continuous Improvement Process Training Instructor	April 1998
Catastrophic Recharge Events Affecting a Karstic Aquifer: Sierra Madre Oriental, Saltillo, Coahuila, Mexico	March 1996
Water Infrastructure Study, Saltillo, Coahuila, Mexico	August 1995
Compliance Audit Training Instructor	February 1995
Field Sampling Technician Course Instructor	Oct-Nov 1994
Environmental Regulations Conference Instructor	March 1993

EMPLOYMENT HISTORY

TEXAS CHRISTIAN UNIVERSITY, Professor of Professional Practice	2004-Pres.
ENVIRONMENTAL TRAINERS, INC., President	2001-Nov 2013
LAW ENGINEERING AND ENVIRONMENTAL SERVICES, INC., Principal & Office Manager	1999-2001
DFW AIRPORT BOARD, Senior Environmental Affairs Analyst	1998-1999
EMCON, Senior Geologist, Fort Worth	1996-1998
CRC ENVIRONMENTAL RISK MANAGEMENT, Director of Fort Worth Operations	1996
FREESE AND NICHOLS, INC., Hydrogeologist, Environmental Science Department	1992-1996
ALBERT H. HALFF ASSOCIATES, INC., Environmental Geologist	1991-1992
GENERAL DYNAMICS, Fort Worth Division, Texas , Engineer	1986-1991
OVERLAND EXPLORATION, Geologic Technician	1985-1986