

COMMONWEALTH OF KENTUCKY
BEFORE THE KENTUCKY STATE BOARD ON ELECTRIC
GENERATION AND TRANSMISSION SITING

In the Matter of:

Electronic Application of Golden Solar, LLC)
for Certificate of Construction for an)
Approximately 100 Megawatt Merchant)
Electric Solar Generating Facility in Golden)
County, Kentucky

Case No.
2020-00243

Notice of Filing

Please take notice that Golden Solar, LLC herewith supplements its prior witness list filing of January 4, 2023, with the CVs of witnesses Bruce Moreira, Yosef Shirazi, Brian Zoeller and Ben Taylor. These are attached hereto.

Respectfully submitted,

/s/ Kathryn A. Eckert

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*Counsel for Applicant,
Golden Solar, LLC*

Bruce Moreira PWS, GISP

Environmental Project Manager
19 years of experience · Portland, Oregon

Mr. Bruce Moreira has 19 years of experience managing environmental permits at the federal, state, and local levels. He has completed wetland delineations, natural resources surveys, vegetation mapping, wetland mitigation design, Phase I environmental site assessments (ESAs), site feasibility studies, federal/state wetland permitting, and local land use permitting across the central and western United States. He has extensive experience in geographic information system (GIS) mapping applications, photo interpretation, and habitat mapping in a range of industries, including transportation, pipelines, wind energy, solar energy, electrical transmission siting and construction, and aviation for state agencies and municipalities. He is a certified Professional Wetland Scientist (PWS) and a certified GIS Professional (GISP).

EDUCATION

MS, Forest Resources, University of Minnesota, Minneapolis, Minnesota, United States, 2001

BA, Biology, Reed College, Portland, Oregon, United States, 1997

REGISTRATIONS

Professional Wetland Scientist #1725, Society of Wetland Scientists Certification Program

Certified Geographic Information Systems Professional (GISP) #67149, GIS Certification Institute

PROJECT EXPERIENCE

PROJECT MANAGEMENT (ENVIRONMENTAL)

Palomino Solar Project | Highland and Clinton Counties, Ohio | Project Manager

Mr. Moreira served as project manager and lead biologist for a 200-megawatt (MW) solar energy project in Ohio for Innergex Renewables. The project included state siting board permitting, biological surveys, wetlands delineations, cultural resources surveys, historic structure inventories, Phase I ESAs, visual simulations, noise modeling, and baseline surveys. US Army Corps of Engineers (USACE) permits and US Fish and Wildlife Service (USFWS) coordination were also completed for the project.

Mountain Valley Pipeline Southgate EIS | North Carolina and Virginia | Biologist

Mr. Moreira served as a team biologist and lead writer for the Water Resources and Wetlands sections for a FERC third-party EIS for a multi-state gas pipeline in North Carolina and Virginia. The project included coordination with FERC and the applicant.

Unbridled Solar Project | Kentucky | Project Manager

Mr. Moreira served as project manager and lead biologist for a 160-MW solar energy project in Kentucky for National Grid Renewable Energy. The project included state siting board permitting, biological surveys, wetlands delineations, cultural resources surveys, historic structure inventories, Phase I ESAs, and noise modeling. USACE permits and USFWS coordination were also completed for the project.

Caldwell Solar Project | Kentucky | Project Manager

Mr. Moreira served as project manager and lead biologist for a 100-MW solar energy project in Kentucky for National Grid Renewable Energy. The project included state siting board permitting, biological surveys, wetlands delineations, cultural resources surveys, historic structure inventories, Phase I ESAs, and noise modeling. USACE permits and USFWS coordination were also completed for the project.

Golden Solar Project | Kentucky | Project Manager

Mr. Moreira served as project manager and lead biologist for a 100-MW solar energy project in Kentucky for National Grid Renewable Energy. The project included state siting board permitting, biological surveys, wetlands delineations, cultural resources surveys, historic structure inventories, Phase I ESAs, and noise modeling. USACE permits and USFWS coordination were also completed for the project.

Hillcrest Solar Project | Ohio | Project Manager

Mr. Moreira served as project manager and lead biologist for a 250-MW solar energy project in Kentucky for Innergex Renewables. The project included state siting board permitting, biological surveys, wetlands delineations, and construction stormwater monitoring. USACE permits and USFWS coordination were also completed for the project.

Four Utility-scale Solar Projects | Ohio | Project Manager

Mr. Moreira served as project manager for archaeology and historic structure inventory surveys for four utility-scale solar energy projects in Ohio for National Grid Renewable Energy. Efforts included archaeological field surveys and historic structure inventories to support state siting board permits for project development.

Commonwealth LNG Terminal Environmental Impact Statement (EIS) | Louisiana | Biologist

Mr. Moreira served as a task lead and team biologist for the Biological Resources sections for a Federal Energy Regulatory Commission (FERC) third-party EIS for a proposed liquefied natural gas (LNG) terminal and associated interconnection pipeline. The project included coordination with FERC and the applicant.

Svensen Island Restoration Project | Oregon | Permit Manager

Mr. Moreira led wetland permitting for a river restoration project on the Columbia River in Clatsop County, Oregon. Work included wetland permitting (Joint Permit Application) coordination with the USACE and Oregon Department of State Lands (DSL).

Longley Meadows Fish Habitat Enhancement Project | La Grande, Oregon | Permit Manager

Stantec was retained by the Bureau of Reclamation to work with the local sponsor, Confederated Tribes of the Umatilla Indian Reservation, to support and assist in obtaining project permits; mapping, identifying, and documenting cultural resources; providing engineering design for large woody material structures; and revegetation, construction phasing, and staging/access plan set development through final design. Mr. Moreira led wetland delineation and permitting for this river restoration project on the Grande Ronde River in Union County, Oregon. His work included wetland delineation update and wetland permitting (Joint Permit Application) coordination with the USACE and Oregon DSL.

National Environmental Policy Act (NEPA) Programmatic Environmental Review for Transportation Safety Improvement Projects, City of Portland Bureau of Transportation (PBOT) | Portland, Oregon | Lead Biologist

Mr. Moreira serves as lead biologist for on-call environmental review services with PBOT. He conducts environmental review of transportation safety improvement projects (e.g., bicycle and pedestrian intersection crossings and greenway trails) for a variety of natural and social resources in support of NEPA categorical exclusions (CEs) and Programmatic CEs and associated reports, including Section 106 archaeological resources and architectural history baseline reports, Endangered Species Act No-Effect Determinations, and Federal-Aid Highway Program Programmatic Notifications.

Palmquist Road Culvert Replacement | Oregon | Permit Manager

Mr. Moreira led wetland delineation and permitting for a culvert replacement project for the City of Gresham in Oregon. Work included wetland delineation, wetland permitting (Joint Permit Application), and Standard Local Operating Procedures for Endangered Species (SLOPES) V Endangered Species Act consultation.

Confidential Pipeline Project, Confidential Client | Multiple Counties, Illinois | Field Wetland Delineator Team Lead

Mr. Moreira led field teams and coordinated logistics for wetland delineations. Stantec completed environmental studies along 120 miles of an NGL pipeline in Illinois for a confidential client covering over 200 wetlands in five counties. Wetland and stream delineations were performed within the project area in addition to botanical inventories and wildlife assessments. Logistical support and organization were required to coordinate site access, complete daily targets, operate within all safety protocols, and coordinate with other team members. Multiple teams completed the wetland and stream delineations within a narrow, 3-week window. Reporting was completed quickly following fieldwork.

Oregon LNG Pipeline Project | Oregon/Washington | Biologist

Mr. Moreira served as the lead biologist on a third-party EIS under FERC review for a proposed 200-mile natural gas pipeline in Oregon and Washington. He led wetlands, soils, and water resources sections for the EIS and field review for biology and natural resources.

Jenkins Road Roadway Expansion Project | Oregon | Permit Manager

Mr. Moreira led state and federal wetland permitting for a road rebuild project in Washington County. He was responsible for the Joint Permit Application to the USACE and Oregon DSL with SLOPES V consultation.

Boones Ferry Road Roadway Expansion Project | Oregon | Permit Manager

Mr. Moreira completed state and federal wetland permitting through the Oregon Department of Transportation (DOT) for a roadway rebuild project in Lake Oswego. His responsibilities included state and federal jurisdictional waters determination, Federal-Aid Highway Program coordination, and Endangered Species Act consultation.

Nike Building 6 Commercial Permitting | Oregon | Permit Manager

Mr. Moreira supported wetland and county permitting for new building construction on the Nike World Headquarters Campus. His responsibilities included wetland mitigation, cultural resources monitoring management, and county permitting.

Crowell Woods Park Municipal Permitting | Oregon | Permit Manager

Mr. Moreira led wetland and county permitting for a new park facility in the Tualatin Hills Park and Recreation District. His responsibilities included wetland delineation and county permitting.

Aktigirquk Road and Mine Expansion, Red Dog Mine | Alaska | Biologist

Mr. Moreira managed wetlands and cultural resources field surveys for a 9-mile access road associated with mining exploration at the Red Dog Mine, Alaska. He managed field crews, supported data collection methods, and led reporting for both wetlands and cultural resources work.

Pebble Mine Project Baseline Surveys | Iliamna, Alaska | Biologist

Mr. Moreira served as a team member for habitat mapping and field surveys for baseline natural resources surveys for the proposed Pebble Mine project around Lake Iliamna, Alaska. He supported off-site habitat mapping based on remote sensing data and field observations points as well as conducting two field deployments to collected field data. Field deployments included habitat reference data collection and wetland delineation across a range of habitats.

Orcas Island Airport Permitting | Washington | Permit Manager

Mr. Moreira supported the Federal Aviation Administration (FAA) NEPA Environmental Assessment and local/state permitting for an airport runway safety project. Work included wetland mitigation design, wetland permit management, agency coordination, and public outreach. His responsibilities included state wetland consultation and preparation of the FAA Finding of No Significant Impact (FONSI).

Scappoose Airport Permitting | Oregon | Permit Manager

Mr. Moreira supported FAA NEPA Categorical Exclusion review for airport improvements. His responsibilities included wetlands/cultural/wildlife surveys, NEPA permitting, and FAA consultation.

Pacific Direct Current Intertie (PDCI) Transmission Upgrade Project | Oregon | Biologist

Mr. Moreira supported a large-scale natural resources survey effort and conducted follow-up surveys for wetland delineation in the field for a 265-mile transmission line rebuild project in central Oregon. He supported regulatory coordination, reporting, and wetland delineation review.

Bonneville Power Administration Spar Canyon Road Development | Idaho | Permit Manager

Mr. Moreira led preliminary site review for a 5-mile access road upgrade project in Custer County, Idaho. Road upgrades were required for access to existing overhead transmission lines.

Springbok 3 Solar Project, 8Minutenergy | California | Permit Coordinator

Mr. Moreira led efforts as the owner's engineer on final permitting and construction efforts on a 50-MW solar project in Kern County, California. He coordinated permitting, design, and contractor selection on behalf of the client.

Columbia River Vessel Traffic Safety Assessment | Washington | Biologist

Mr. Moreira led outreach efforts for the Columbia River Vessel Traffic Safety Assessment for potential oil shipping traffic increases on the Columbia River between the Port of Vancouver and the Pacific Ocean. He coordinated outreach efforts on behalf of Washington Department of Ecology Spills Division with a range of project stakeholders.

Wind Energy Projects, Apex Clean Energy | Oklahoma/Missouri | Permit Manager and Biologist

Mr. Moreira managed and conducted wetlands, cultural resources, and Phase I environmental site assessment surveys and permitting for six utility scale wind facilities totaling 1,800 MW in generation capacity in Missouri and Oklahoma. Project development and permitting on each project required preliminary turbine siting coordination, agency consultation, and final client site reviews to optimize project layouts.

Avangrid Wind Energy Projects | Colorado, Minnesota, North Dakota, and South Dakota | Permit Manager and Biologist

Mr. Moreira managed and conducted wetlands, cultural resources, and Phase I environmental site assessment surveys and permitting for nine utility scale wind facilities totaling 950 MW in generation capacity in Colorado, Minnesota, North Dakota, and South Dakota. Project development and permitting on each project required preliminary turbine siting coordination, agency consultation, and final client site reviews to optimize project layouts.

Sundance Wind Project, EDF Renewables | British Columbia, Canada | Biologist

Mr. Moreira was a section author and support staff on an environmental assessment for a proposed 250-MW wind energy project in British Columbia, Canada. Environmental review included a range of natural resources, including wildlife, wetlands, socioeconomics, visual impacts, and noise impacts.

Taylor Wind Project, EDF Renewables | British Columbia, Canada | Biologist

Mr. Moreira was a section author and support staff on an environmental assessment for a proposed 300-MW wind energy project in British Columbia, Canada. Environmental review included a range of natural resources, including wildlife, wetlands, socioeconomics, visual impacts, and noise impacts.

RES Americas Wind Energy Projects | Colorado/Michigan/Minnesota/North Dakota/South Dakota | Permit Manager and Biologist

Mr. Moreira managed and conducted wetlands, cultural resources, and Phase I environmental site assessment surveys and permitting for eight utility-scale wind facilities totaling 1,200 MW in generation capacity in Colorado, Michigan, Minnesota, North Dakota, and South Dakota. Project development and permitting on each project required preliminary turbine siting coordination, agency consultation, and final client site reviews to optimize project layouts.

Ellwood Battery Storage Project, RES Americas | Illinois | Permit Manager

Mr. Moreira was the permit manager for a sound analysis on a proposed 40-MW battery storage facility located in West Chicago, Illinois. Analysis included sound modeling of peak project output, design of sound mitigation structures to reduce sound emissions below regulated levels, and technical coordination on plant development with local regulatory staff.

Bison I Wind Project, Minnesota Power/Allete Clean Energy | North Dakota | Permit Manager and Biologist

Mr. Moreira led permitting and field surveys for an 82-MW wind energy project and 21-mile transmission line. He led the site permit application process for the wind project and the route permit application for the transmission line through the North Dakota Public Service Commission. He managed wetlands, cultural resources, and Phase I environmental site assessment surveys and permitting for the project. Project development and permitting on each project required preliminary turbine siting coordination, agency consultation, public meetings and coordination, and final client site reviews to optimize project layouts.

San Andres Island Renewable Energy Initiative, Carbon War Room | Colombia | Technical Outreach and Facilitation

Mr. Moreira led outreach and community engagement to educate the local community on the Caribbean Island of San Andres about renewable energy. The outreach effort was financed by Carbon War Room to help reduce fossil fuel consumption for the island. The outreach included coordination with the local electrical utility, public meetings, promotional interviews with TV, radio, and print media, and technical review of wind energy alternatives for the island.

Pho Cong Wind Project | Vietnam | Natural Resources Technical Lead

Mr. Moreira led natural resources review for a feasibility study of the proposed Pho Cong Wind Project on the coast of southern Vietnam for the U.S. Trade and Development Agency. The feasibility study included analysis of a range of project development components including sensitive species, marine impacts, socioeconomics, construction logistics, and visual assessments.

ON Line Transmission Project | Nevada | Biological Monitor

Mr. Moreira supported biological monitoring efforts during construction of a 235-mile, 500-kV electrical transmission project. The effort included construction monitoring for compliance with biological regulations established by the NEPA permit and wildlife/wetlands surveys for project realignment.

Yosef Shirazi, Ph.D.

Current Title
Senior Economist

- Discipline Areas**
- > Cost-Benefit Analysis
 - > Economic Impacts Assessment
 - > Renewable Energy Integration
 - > Vehicle Electrification

Years' Experience
13

Joined Cardno
2017

- Education**
- > PhD, Marine Studies, University of Delaware, 2019
 - > MS, Marine Science, University of North Carolina at Wilmington, 2011
 - > BS, Biology, University of Maryland, 2007
 - > BS, Environmental Science and Policy, University of Maryland, 2007

- Certifications**
- > OSHA 40-Hour Hazwoper Certification
 - > Delaware Valley Safety Council -Basic Orientation Plus Certification
 - > CPR/First Aid/Defibrillator Training Certification

Summary of Experience

Dr. Shirazi has over 13 years of experience in the fields of ecology and economics. He has performed extensive work valuing ecosystem services, conducting social cost-benefit analyses and assessing socioeconomic impacts. His areas of technical expertise include welfare economic accounting, economic impacts, modeling biophysical relationships, and electrical grid operations and markets. Dr. Shirazi excels in highly interdisciplinary teams where he can leverage his knowledge of biological, engineering and economic disciplines to harmonize analytical targets and methodologies. Several of these efforts are included in his doctoral thesis, entitled: Three Essays on Social Cost Elements of Electricity Generation and Storage in the Mid-Atlantic Region.

Significant Projects

Clean Water Act 316(b) Compliance – Various Power Generating Facilities in the US (2017 – Present)

Dr. Shirazi evaluates social benefits and social costs from changes in the impingement and entrainment of aquatic organisms under different technological options for cooling water intakes at large electricity generating stations. Specific tasks include collaborating with engineers and biologists to ensure data harmonization and understanding of technological costs; developing models to monetize increased commercial and recreational harvests of aquatic organisms; estimating changes in non-use values associated with changes in ecosystem function; and drafting reports detailing methodology and findings.

ITC Deer Park NRDA Analysis – Coastal Texas (2019 – Present)

Dr. Shirazi investigates and quantifies damages to social welfare from a large petroleum product fire and petroleum product release into a coastal environment. Short- and long-term impacts to coastal recreational pursuits and visual disamenity of a large smoke plume were assessed. Extensive on-site field work, detailed reviews of academic literature, and Monte-Carlo analysis were conducted to reasonably estimate and bound damages.

Environmental Assessments for Economic Development – Socioeconomic and Visual Impacts Analyses, TVA Various Facilities (2018 - 2021)

Dr. Shirazi assessed the impacts to the socioeconomic environment and visual resources within the NEPA framework for numerous proposed economic development projects in the TVA service area. Analyses included comparisons of detailed demographic data for populations at different levels of political geography relative to the proposed location. Potential impacts of development activity to these populations were assessed, including any impacts to visual resources in the surrounding area.

Zero Emission Vehicles Analysis - American Fuel and Petrochemical Manufacturers (2018 - 2019)

Dr. Shirazi assessed the impacts to social welfare from regulation-induced increases in electric vehicle adoption and the distribution of these impacts over space and time. Particular areas of focus included changes in total emissions of greenhouse gases and criteria pollutants; impacts to congestion and safety; and required levels of subsidies to achieve target levels of electricity vehicle penetration.

Benefit Cost Analysis of Salton Sea 10-Year Management Plan – Salton Sea, CA (2021 – Present)

Dr. Shirazi is responsible for the development of a robust benefit-cost analysis accounting for all materially foreseeable benefits and costs of large public projects aimed at restoring habitat and suppressing dust in the Salton Sea watershed. Analysis incorporates uncertainty through extensive Monte-Carlo simulations. Activities also include development of robust benefit-cost documentation and frequent interfacing with federal and state funding agencies. Benefit analysis included the monetization of changes in agricultural yield and human health resulting from dust suppression, increases in recreational benefits, and potential increases in non-use values among other categories. Cost of construction and operations of proposed plan.

TVA Green Power Provider Program Modification Socioeconomic Analysis (2019)

Dr. Shirazi assessed the impacts of a proposed modification to the Tennessee Valley Authority's Green Power Plan on the projected generation source mix in the valley. This analysis modeled the impacts to residential and commercial adoption of distributed generation resources based on modified financial incentives provided to end users, and the anticipated change this causes to the quantity of distributed electricity generation on the grid. Dr. Shirazi also developed analysis to assess how different types of third-party certification programs of solar equipment and installers can influence solar adoption rates and reduce concerns of project risk.

TVA Wholesale Rate Change Socioeconomic Analysis (2018)

Dr. Shirazi assessed socioeconomic impacts of a proposed electricity rate change for Tennessee Valley Authority. Areas addressed include impacts to residential adoption of distributed generation resources and changes in electricity bills across income brackets and seasons. Dr. Shirazi also developed models to assess changes to rooftop solar return-on-investment metrics under different policy scenarios from both public and private perspectives.

Habitat Equivalency Analysis – Mid-Atlantic Calpine Facility (2018)

Dr. Shirazi estimated the discounted ecosystem service credits earned from restoration activities to a mid-Atlantic marsh over a distant and uncertain analysis horizon. Dr. Shirazi incorporated various sources of uncertainty to bound estimates, including the progression of sea level rise in future years and the response of marsh vegetation to sea level rise.

Selected Publications

- **Shirazi, Y. A.**, Carr, E. W., Parsons, G. R., Hoagland, P., Ralston, D. K., & Chen, J. (2019). Increased operational costs of electricity generation in the Delaware River and Estuary from salinity increases due to sea-level rise and a deepened channel. *Journal of environmental management*, 244, 228-234.
- Carr, E. W., **Shirazi, Y.**, Parsons, G. R., Hoagland, P., & Sommerfield, C. K. (2018). Modeling the economic value of blue carbon in Delaware estuary wetlands: historic estimates and future projections. *Journal of environmental management*, 206, 40-50.
- **Shirazi, Y.**, Carr, E., & Knapp, L. (2015). A cost-benefit analysis of alternatively fueled buses with special considerations for V2G technology. *Energy Policy*, 87, 591-603.
- **Shirazi, Y. A.**, & Sachs, D. L. (2018). Comments on “Measurement of power loss during electric vehicle charging and discharging”—Notable findings for V2G economics. *Energy*, 142, 1139-1141.

- Veron, D. E., Brodie, J. F., **Shirazi, Y. A.**, & Gilchrist, J. R. (2018). Modeling the electrical grid impact of wind ramp-up forecasting error offshore in the Mid-Atlantic region. *Journal of Renewable and Sustainable Energy*, 10(1), 013308.
- Hoagland, P., Beet, A., Ralston, D., Parsons, G., **Shirazi, Y.**, & Carr, E. (2020). Salinity intrusion in a modified river-Estuary system: An integrated modeling framework for source-to-Sea management. *Frontiers in Marine Science*, 7, 425.

Testimonial Experience

Socioeconomic Impact Analyses for State Siting Boards - Various Midwestern States (2021 – Present)

Dr. Shirazi conducts analyses and provides expert testimony on behalf of renewable energy developers to state siting boards regarding job creation, economic impacts, and other metrics related to project development and operation. Dr. Shirazi presents and explains analytical findings and defends his methodologies under oath.



Brian D. Zoeller

Partner

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Industries

Consumable Goods

Energy

Health Care Innovation

Manufacturing

Oil, Gas & Minerals

Renewables

Practice Areas

Commercial Finance

Commercial Real Estate
Finance

Corporate Law

Land Use & Zoning

Real Estate

Bar Memberships

Kentucky

Brian leads the firm's Renewable Energy Industry Team and primarily focuses on advising clients on project development, including utility scale-solar projects, landfill gas to energy projects and anaerobic digester facilities. Additionally, he advises clients on traditional commercial real estate transactions, including developing, purchasing, selling, financing and leasing of multi-family developments, shopping centers and industrial buildings.

He is currently involved in the development of solar facilities with an aggregate capacity of over 2 GW. This work includes advising clients on all aspects of the development of utility-scale solar projects, including the following:

- Real property issues including lease drafting and negotiations, purchase and sale agreement drafting and negotiations, easements and right-of-way for tie-lines, surface and mineral rights, and title insurance
- Local and state tax incentives such as KEIA and Industrial Revenue Bonds
- Treatment of ad valorem property taxes
- Sales and use tax liability and related exemptions
- Filing and processing applications for construction certificates from the Electric Generation and Transmission Siting Board

In addition to his solar development practice, Brian has negotiated landfill gas rights agreements, gas purchase agreements on the NAESB form, interconnect agreements for injection of renewable natural gas, and marketing agreements for the sale of environmental attributes from renewable natural gas. He has advised clients on all phases of renewable energy project development, including site identification and acquisition, obtaining zoning approvals, financing, community engagement, tax credit and incentive procurement, and carbon accounting under the GHG protocol.

Other Info About Brian

Experience

Advising clients on the procurement of renewable natural gas for reduction of Scope 1 carbon emissions and monetization of related environmental attributes

Assisted a client with the refinancing of an 80-unit apartment complex in New Mexico and a 2,400-acre recreational farm in Arkansas

Represented a joint venture in its development, construction and financing of a 301-unit apartment complex

Counseling a developer on the debt and equity financing for the construction of a 117- unit assisted living facility in Texas

Advising a develop on the debt and equity financing for the construction of a 180-unit multi-family facility in New Mexico

Assisted M&M Cartage in the procurement of a \$1,000,000 tax incentive package under the KEIA and KBI programs for the relocation of its corporate headquarters and the procurement of a \$300,000 CMAQ grant for the purchase of five CNG-powered Class 8 trucks

Represented Kentuckiana Cleanfuel in the procurement of a \$2.32 million CMAQ grant for the development of three compressed natural gas fueling stations and the procurement of tax incentive packages of \$500,000 and \$400,000 under the Incentives for Energy Independence Act for two of those CNG fueling stations

Represented a client in its closing of a \$31.9 million loan for the construction of a long-term care facility in Wellington, Florida and a \$13.9 million loan for the construction of 120-bed skilled nursing facility in Lutz, Florida, both under the HUD's 232 Lean Program

Education

University of Louisville, Louis D. Brandeis School of Law, J.D., 2002

University of Louisville, M.B.A., 2002

Bellarmine University, B.S., Mathematics/Actuarial Sciences, 1996, *cum laude*

Recognition

The Best Lawyers in America®

Construction Law, 2013-2023; Louisville Construction Law “Lawyer of the

Year,” 2022

Real Estate Law, 2013-2023

Selected for inclusion in *Kentucky Super Lawyers*®, 2022-2023

Senior Articles Editor, *Brandeis Law Journal*

Honorable Mention All American – Golf, 1993

Professional Affiliations

Kentucky Bar Association

Louisville Bar Association

Civic Activities

Board Member, Louisville Sustainability Council

Member, Saint Agnes Worship Committee

Counsel to the Kentucky Clean Fuel Coalition

Frost Brown Todd Articles

[Industrial Revenue Bonds and the Impact on Local Communities and Solar Developers](#)

[Kentucky PSC Chairman Comments on Solar Development Siting Issues](#)

[Impacts of the Repeal of Ohio’s Renewable Portfolio Standards with HB 6](#)

Benjamin W. Taylor, P.E., P.G.

Principal | Regional Manager | Geotechnical Engineer

PROFESSIONAL EXPERIENCE

Mr. Taylor is Regional Manager for Terracon's Louisville and Lexington, Kentucky offices. His geotechnical engineering experience includes subsurface investigations utilizing geotechnical drilling, various in-situ testing (CPTu, DMT, pressure meter), interpretation of geophysics for site characterization, load testing of anchors and foundations, engineering analysis (shallow and deep foundations, slope stability), and recommendations for geotechnical design and construction. Project experience includes design-build, geohazard identification, assessment, and mitigation, methods consulting for characterization of challenging sites, including karst, landslide, mines, brownfields, ect.

PROJECT EXPERIENCE

GeoHazard Consulting

TransCanada and Columbia Pipeline Group (CPG)

Client National Account Manager (NAM) and project engineer for over 100 geotechnical and materials projects since 2012. Service in consulting on geohazards (i.e. erosion, sinkholes, slope failures, washouts, etc.) to support the pipeline integrity management program by managing a database for over 100 geohazard sites across the system and developing a 4-phase strategy for geohazard management.

Confidential Pipeline Project - Pennsylvania, West Virginia, and Ohio

Project engineer for the proposed 600+ mile pipeline project. Terracon began by identifying areas of potential slope instability, along or in the vicinity of the proposed pipeline alignment by GIS-Modeling, helicopter survey, and individual site visits to assess site conditions. Terracon's site reconnaissance allowed observation of the potential or ongoing landslide affected areas from a geotechnical perspective and was used to finalize the project's actual scope of work. The project spans 713 miles, Terracon has completed over 100 HDD borings to depths of 60 to 590 feet, totaling nearly 20,000 lineal feet of drilling through soil and coring bedrock, The borings are in open land, forest and vegetation parcels, at varying elevations, for the pipeline's Supply, Mainline and Marketing segments.

Charleston Area Slip Assessments – Kanawha County, WV

Project manager conducted or coordinated field investigation for multiple site landslide assessments. The project consisted of GIS study, and field assessment leading to proposals for geohazard exploration for mitigation recommendations.

High Strain Site Assessments– MS, TN, KY, WV, OH and PA

Project manager conducted or coordinated field investigation for multiple site geohazard assessments. The project consisted of field and hazard assessment review leading to proposals for geohazard exploration for mitigation / remediation recommendations.



EDUCATION

Bachelor of Science, Master of Engineering, Bachelor of Science, and Environmental Certificate

Civil & Environmental Engineering, University of Louisville, J.B. Speed Scientific School of Engineering, Louisville, KY May 2006

REGISTRATIONS/ CERTIFICATIONS

Registered Professional Engineer:
Kentucky, No. 27823
Indiana, No. PE11200425
Illinois, No. 062071946
West Virginia No. 20172
South Carolina No. 28697

AFFILIATIONS

Society of American Military Engineers Board Member

American Society of Civil Engineers (ASCE) – member

Kentucky Society of Professional Engineers (KSPE)

American Council of Engineering Companies (ACEC)- Kentucky

Kentucky Geotechnical Engineering Group (KGEG) – member

Rotary Club of Louisville – member and committee chair

AEP Landslide Characterization - Prestonsburg and Martin, KY

Geotechnical exploration, laboratory testing, and slope inclinometer monitoring. The purpose was to remediate a slope that failed following heavy rains and tornados in the area. This project consisted of drilling at two landslides, installing and monitoring of slope inclinometers. A dozer was required to build temporary access for exploration.

Industrial

Brown-Forman Distillery Expansion – Louisville, KY

Project Geotechnical Engineer for distillery expansion to include new office, security building, granary, fermentation tanks, and loadout for barrels. Geotechnical exploration includes soil borings to depths of 40 to 100 feet, CPTu soundings, ReMi shear wave velocity testing, as well as test-pits for infiltration testing and delineation of existing fill. Recommendations were provided for support of shallow spread footings, mat foundations, and ground improvement for areas of existing fill and to limit settlement of mat foundations supporting large area loading.

Angels Envy New Distillery - Henry County, KY

Project Geotechnical Engineer for new distillery. Shallow bedrock and karst conditions at the site provided challenges for foundation support and site preparation. Our exploration services included geophysical electrical resistivity imaging (ERI), soil borings, and test pits. Recommendations were provided for placement of shot rock fill from onsite blasting during grading and support of barrel warehouses on shallow spread footings.

Wild Turkey New Distillery, Bottling Plant, Barrel Dump, and Visitor Center – Lawrenceburg, KY

Served as Project Geotechnical Engineer for the distillery improvements. Geotechnical engineering consisted of solutions to challenges at the site, including karst topography, rock slope stability, bedrock excavation, and building foundations that would transition from soil to rock bearing across the footprint of the facility. Wild Turkey sells about a million 9-liter cases annually, according to a state news release. The facility has the capability of producing more than 4 million cases annually.

Autoneum (Project Mohawk) Tract 15 River Ridge Commerce Center - Jeffersonville, IN

Project manager for geotechnical investigation of 500,000 sqft industrial and warehouse facility. Project challenges included fast-paced schedule, winter construction, and remediation of sinkholes formed in the karst bedrock which was overlain by potentially expansive pyritic shale. Project included test pits, geophysical testing, soil borings, rock soundings, laboratory testing, observation of sinkhole remediation.

PRESENTATIONS/ PUBLISHED ARTICLES

"Informing of Expected Geotechnical Conditions Before We Get on Site", presented at the 17th Annual Geohazards in Transportation in Appalachia Technical Forum, Virginia Tech, Blacksburg, VA, August 2017

"Reinforcement of a Pipeline Right-of-Way in Eastern Kentucky: A Case Study" Geo-Congress 2020 GSP 316

"INGAA Steep Slope Workshop" Panelist, Houston, TX

"Geohazard Identification, Assessment, and Mitigation", presented at the American Petroleum Institute Pipeline Conference and Control Room Forum, Phoenix, AZ

"Pipeline Geohazard Management", presented on behalf of TC Energy at the Southern Gas Association (SGA) 2017 Operating Conference, Atlanta, GA, July 2017

"Informing of Expected Geotechnical Conditions Before We Get on Site", presented at the 17th Annual Geohazards in Transportation in Appalachia Technical Forum, Virginia Tech, Blacksburg, VA, August 2017

"Geohazard Identification Training - Landslides", presented at Columbia Pipeline Group (CPG) Pipeline Integrity Summit, Charleston, WV, May 2016

"Pipeline Geohazards and Management Strategy", presented at NiSource Pipeline Engineers Meeting, Charleston, WV, September 2013

Healthcare

Ft Knox Medical Replacement Clinic (USACE Louisville District) - Ft Knox, KY

Design-build project for a new medical clinic to replace some of the functions of the current, aging Ireland Army Community Hospital, which was built in the mid-1950's. Foundation recommendations included both deep and shallow support options taking into consideration variable subsurface conditions from existing undocumented fill of previous development/demolition and karst topography. Geotechnical models were developed from soil borings, test pits, geophysical test results, and historic exploration data using gINT Civil Tools for subsurface interpretation and BIM workflows.

VA Master Plan Leestown Campus Pavement Evaluation (Veterans Affairs) - Lexington, KY

Project included evaluation of existing pavements and subsurface exploration for proposed campus expansion at a functioning hospital. Mr. Taylor conducted geotechnical engineering analysis and prepared recommendations as the Senior Geotechnical Engineer on the project.

Federal

NSA Building 3032 New Kennel (USACE Louisville District) - Crane, IN

Design of a new kennel building, renovations to the existing kennel, expansion of training course, and addition of ADA compliant pavement. Test borings revealed on-site fill, and shallow bedrock. Design recommendations were provided for the shallow foundation support, slab on-grade, and Portland cement concrete pavement.

Commercial / Multi-Family

The Grove at Louisville – Louisville, KY

Brownfield redevelopment project for University of Louisville-affiliated student housing complex of former industrial property. Conducted geotechnical exploration for the four-story, 254 unit, 618,520 SF residential structure, 7,290 SF retail space, and 140,000 SF 4-story parking garage. Services included: foundation types (shallow and deep) and design parameters, subgrade improvement recommendations (rammed aggregate piers) site preparation and construction of controlled fills, slabs-on-grade, seismic site classification, recommendations, and section thickness for flexible and rigid pavement sections. Compressible soils and undocumented fills were unsuitable for direct support of foundations for the proposed development. Ground improvement methods were chosen to facilitate support of shallow foundations on the improved soils while minimizing excavation of materials for haul-off.

Retreat at Louisville (Student Housing Facility) – Louisville, KY

Conducted geotechnical exploration for 66 duplex and quadplex residential structures and approximately 10,000 SF clubhouse. Services included: foundation types (shallow and deep) and design parameters, subgrade improvement recommendations (rammed aggregate piers and deep dynamic compaction) site preparation and construction of controlled fills, slabs-on-grade, seismic site classification, and recommendations.

Education

Kingsolver-Pierce Elementary School, USACE Norfolk District, DoDEA – Fort Knox, KY

New, updated elementary school for Ft. Knox. Terracon provided geotechnical engineering, construction quality assurance testing, and inspection services. Test borings revealed on-site fill, compressible soils, and karst conditions. Design recommendations were provided for the shallow foundation support, slab-on-grade, and Portland cement concrete pavement. Mr. Taylor conducted a geotechnical engineering analysis and prepared recommendations for the Senior Geotechnical Engineer on the project. Size: 115,289 SF

Additions to Stuart Pepper Middle School – Brandenburg, KY

Geotechnical consultant for facility additions of approximately 25,000 SF including a gymnasium, locker rooms, offices, and labs. Geotechnical services included both a preliminary and final subsurface exploration, pavement condition survey, and geophysical survey to identify depth to bedrock and help assess the site for karst potential. Conditions reflected both the presence of uncontrolled fill, rock pinnacles, and soil softening associated with sinkhole formation. Recommendations were provided for the remediation of karst features by compaction grouting to enable the use of shallow foundations were provided.

Baxter I Basement Exhaust Return University of Louisville - Louisville, KY

Conducted geotechnical exploration for proposed infrastructure upgrades to the existing Baxter I Biomedical Research building located at the University of Louisville Health Sciences Campus. The improvements included the construction of a new areaway consisting of a below-grade earth retaining structure to facilitate ventilation of exhaust from the basement level. Terracon explored the subsurface conditions adjacent to the existing structure and provided recommendations for design of mat foundation support.

Oil and Gas Transmission Pipelines

Opinion of Probable Cost Feasibility Study - Confidential LG&E Project

Project manager for geotechnical and environmental engineering support to a local pipeline design firm in their feasibility evaluation to LG&E for a confidential 10-mile lateral pipeline in Kentucky. A key component was the development of an Opinion of Probable Cost (OPC). In our role, Terracon provided professional judgement for the geotechnical and environmental related functions and anticipated cost for future feasibility study.

Bardstown Road M&R Facility Design for LG&E – Louisville, KY

Terracon provided geotechnical engineering services to support the Project Associates, LLC design of improvements to an existing metering and regulator facility. Our services included subsurface exploration, laboratory testing, development of geotechnical engineering parameters, and recommendations for site preparation, excavation, and foundation support.

Power Generation

LG&E Mill Creek Pozotec Landfill for AECOM – Louisville, KY

Project manager for geotechnical field exploration and laboratory testing to support design by AECOM for the proposed landfill at the LG&E Mill Creek generating station. Services included 200 linear feet of drilling, laboratory index classifications, consolidation, and compressive strength testing.

LG&E Mill Creek Clearwell / Dead Storage Pond Divider Dike for AECOM – Louisville, KY

Project manager for geotechnical field exploration and laboratory testing to support design by AECOM for the proposed landfill at the LG&E Mill Creek generating station. Services included 80 linear feet of drilling, laboratory index classifications, consolidated-undrained triaxial, unconsolidated-undrained triaxial, constant head permeability, direct simple shear, and compressive strength testing.

LG&E Mill Creek Ash Treatment Basin (ATB) Closure for AECOM – Louisville, KY

Project manager for geotechnical field exploration and laboratory testing to support design by AECOM for the proposed landfill at the LG&E Mill Creek generating station. Services included 495 linear feet of drilling, laboratory index classifications, consolidation, and constant head permeability testing.

Power Transmission

Duff-Coleman 345kV Transmission Line – Duff, IN to Lewisport, KY

This project consisted of about 30-miles of proposed transmission line to connect an existing substation in Duff, IN to an existing substation in Lewisport, KY. Served as geotechnical project manager and local technical lead for multiple confidential clients. Services involved preparing a Report of Expected Geotechnical Conditions (REGC) for the proposed route alignment(s) to support the design team in their preliminary budgeting of foundations for the project.

Hoosier Energy Solar Ireland Transmission Line Reroute - Ireland, IN

Geotechnical exploration, laboratory testing, and geotechnical analysis to provide recommendations for soil and rock parameters for design of direct embed wood pole structures (by others). Project consisted of re-locating a transmission line through an area of active coal mining.

Pee Dee Generating Station – Georgetown, SC

Field management of geotechnical exploration for Phases II and III of the proposed Santee Cooper Pee Dee Generating Station. The purpose was site characterization and recommendations for development of the proposed power plant. The field exploration included soil test boring, piezocone penetration test soundings, flat blade dilatometer test soundings, the excavation of several test pits and hand auger borings.

Transportation

Morgan County KY 172 Widening and Straightening - West Liberty, KY

Project Manager for Geotechnical investigation of 3.0 miles of roadway on KY 172 in Morgan County. The purpose of the project was to widen and straighten areas of the 3-mile section of KY 172 to increase safety and serviceability of the corridor. Structures included 1 bridge 2 retaining walls and the extension of 7 culverts. Project included drilling, laboratory testing, analyses, and recommendations for culvert extensions and the design of two retaining walls, a bridge and the roadway.

KYTC Contract Drilling Management – Various Projects and Locations in KY

Project manager for several KYTC Contract Drilling Projects in Northern and Central Kentucky. Responsible for access evaluation, coordination of site clearing (if needed), property owner contact and utility clearance, field exploration management, sample review, gINT logs, pay estimate preparation and invoicing.

Glenns Bay Road Widening and Highway 17 Overpass - Myrtle Beach, SC

Served as Staff Geotechnical Engineer on this roadway widening and grade separated intersection project. Coordinated drilling, sampling, and laboratory testing and provided geotechnical support to design team. Field exploration included hand auger borings with dynamic cone penetrometer testing, pavement coring, falling weight deflectometer, soil test borings with rock coring, piezocone penetration test soundings, and flat blade dilatometer test soundings.

Charlotte Area Transit System (CATS) Light Rail Extension - Charlotte, NC

Served as Staff Geotechnical Engineer for the 30% design phase for the proposed extension of the LYNX Blue Line Light Rail for the Charlotte Area Transit System (CATS). Performed analyses and provided geotechnical recommendations for drilled shafts, driven piles, and shallow foundations for several bridges.

Interstate 73 – Dillon and Marion Counties, SC

Field engineer on the 43.5-mile South Carolina Department of Transportation (SCDOT) proposed Interstate 73 Southern Section, which is located in the northeastern corner of South Carolina. Coordinated drilling, sampling and provided geotechnical support to design team. Field exploration included soil borings, CPTu soundings, and DMT soundings at the proposed bridge sites.

Water / Wastewater

Southwestern Park Way CSO Basin - Louisville, KY

The Southwestern Parkway Combined Sewer Overflow (CSO) Basin project was a component of Louisville and Jefferson County Metropolitan Sewer District's Federal Consent Decree to mitigate CSO's that discharge into local waterways. This design-build project consisted of a 20 million gallon concrete storage tank and associated washdown systems, odor control provision and a 30 MGD effluent pump station. Located in Shawnee Park, which is part of the Olmsted park system in Louisville and is listed on the National Register of Historic Places. The basin was constructed below the surface of the Great Lawn in Shawnee Park with a walk-out operational access point concealed by park topography. During construction, challenges with the dewatering system required the installation of piezometers to help determine excavation sequencing. Terracon installed piezometers within the excavation, in-progress.

Gateway Area Sanitary Sewer Extension - Jeffersonville, IN

Senior engineer for geotechnical exploration of extension to existing sanitary sewer line replacements and repairs along steeply sloping terrain. Geotechnical engineering services included traditional geotechnical borings in addition to soil probe tests to develop a soil-rock profile.

Black River Water Treatment Plant - Georgetown, SC

Project manager for preliminary and final geotechnical exploration for the proposed Black River Water Treatment Facility. Preliminary geotechnical services consisted of a feasibility study of 5 sites. Upon selection of the project site a final geotechnical exploration was performed to provide recommendations for design and construction, including foundation support, uplift resistance, construction dewatering and excavation procedures, and liquefaction mitigation (of loose saturated sands) through the installation of earthquake drains.

West Georgetown County Water Improvements Phase II, Georgetown County Water & Sewer Improvements - Georgetown, SC

Project manager for geotechnical exploration of directional drill site along the proposed water transmission line. The several thousand linear feet of water line will be constructed as Phase II of the of the West Georgetown County Water Improvements crossing under the Black River and connecting to the Black River Water Treatment Facility.

Ocean Outfall Projects - Myrtle Beach, SC

Project manager for geotechnical exploration(s) at the sites of three proposed ocean outfall projects. Exploration consisted of near-shore drilling/insitu testing and offshore drilling utilizing a lift boat. Borings were located by directing lift-boat captain utilizing a hand-held GPS. Deep water ocean outfalls will help to reduce near-shore water pollution and prevent high bacteria levels near the shore by better managing storm water. The ocean outfall projects will discharge 1,200 feet offshore. Similar construction is on hold indefinitely due to funding. Construction of previous similar projects were completed in 2003 and 2006. Approximately \$40 million will be spent to replace beach discharge pipes with deep water ocean outfalls.