STATE OF NEW YORK
PUBLIC SERVICE COMMISSION

Application of Galloo Island Wind Transmission Facility for a Certificate under Article VII of the Public Service Law

Case No. 18-T-0015

PRE-FILED TESTIMONY OF:

GIRISH BEHAL, PMP

DIRECTOR —STRATEGIC INITIATIVES

SNC-LAVALIN D/B/A SNC LTD

Q: Please state your name, employer, and business address.

A: Girish Behal, PMP, SNC-Lavalin, 150 State Street, Suite 102, Rochester, New York, 14614.

Q: What is your position at SNC-Lavalin?

A: Director—Strategic Initiatives and Development

Q: How long have you been employed with SNC-Lavalin?

A: I have been employed with SNC-Lavalin since June 2011.

Q: Please describe your educational background and professional experience.

A: I received a Diploma and Bachelor of Civil Engineering from Maharaja Sayajirao University, Baroda, Gujarat, India. I also received a Graduate Certificate in Power Systems and a Master of Science in Electrical and Computer Engineering (Power Systems) from Worchester Polytechnic Institute. In 2017, I received a Master of Business Administration from the Simon Business School, University of Rochester. I have more than 14 years of experience in onshore and offshore renewables, transmission and distribution projects for voltage levels from 11 kV to 345 kV, involving substation, overhead and underground transmission lines. My curriculum vitae is attached.

Q: Please describe your current responsibilities with SNC-Lavalin.

A: I am responsible for leading and managing project development in the area of onshore and off-shore renewables, portfolio management of key projects in the area of FERC 1000, interregional transmission planning, and strategic due diligence. I also provide project-specific oversight to the engineering teams that perform interconnection analysis, congestion analysis and additional studies and engineering to support projects in the power sector.

Q: Have you previously testified before the New York State Public Service Commission or Siting Board on Electric Generation?

A: No.

Q: Have you previously served as an expert witness before any other court, agency, or other body on the subject you plan to offer testimony on today?

A: I have testified in various local and state proceedings, as listed below, as it relates to the siting of Power Facilities:

2013 Station 251 Project, Town of Brighton Planning Board, Brighton, New York

2011 Station 124 Expansion Project, Town of Penfield, Planning and Zoning Commission, Penfield, New York

2010 New 115-kV Substation in Westport, CT, Connecticut Siting Council, Westport, Connecticut

2010 115-kV Circuit Separation Project, Massachusetts Department of Public Utilities, Boston, Massachusetts

2008 New 115-kV Substation in Waterford, CT, Connecticut Siting Council, Waterford, Connecticut

2008 New 115-kV/11.5-kV Substation, Connecticut Siting Council, New Britain, Connecticut

Q: What is the purpose and scope of your testimony in this proceeding?

A: To sponsor certain portions of the Galloo Island Wind Transmission Facility Application or the Exhibits thereto.

Q: What portion(s) of the Application is your testimony sponsoring?

A: Exhibit E-4.4: System Studies.

Q: Were these Exhibits, Application sections, or studies prepared by you or under your direction and supervision.

A: No. See response to the following question for additional information.

Q: In your testimony, will you refer to, or otherwise rely upon, any studies, publications, data or documents produced by persons other than yourself/your company? If so, please cite these sources. [These are independent studies, etc.]

A: Yes. The System Reliability Impact Study (SRIS) referenced in Exhibit E-4.4 was developed in accordance with procedures set forth in the Open Access Transmission Tariff (OATT). That process involves input from the developer, transmission owner, and New York Independent System Operator (NYISO). NYISO uses the information provided and other critical infrastructure information to run a standardized set of models and complete the SRIS. I have reviewed the SRIS and am familiar with the information/conclusions it contains.

Q: Does this conclude your testimony?

A: Yes.

GIRISH BEHAL, PMP

SNC·LAVALIN

Mr. Girish Behal, PMP, has more than 14 years of experience in a variety of onshore and offshore renewables, Transmission and Distribution projects for voltage levels from 11 kV to 345 kV, involving substation, overhead and underground transmission lines, Statcom, Static Var Compensator and Phase shifting transformers. Mr. Behal also has experience working on hydrocarbon refinery projects in an Engineering Procurement Construction (EPC) environment. His responsibilities have included Project Development, Project Management, Contract Management and Negotiation, Engineering Management, planning, coordination of various disciplines, construction supervision and outage management. Mr. Behal's current focus is to provide value-added project development solutions to the clients utilizing his engineering and business experience. Mr. Behal's current focus is to provide value-added development solutions for HVAC and HVDC transmission, onshore and offshore renewables and FERC 1000 project development in the United States. Prior to that, he has managed several transmission and distribution projects from project scope definition, including initial system planning studies, to commissioning and closeout, including managing a group of Project Managers and teams to support client needs. Mr. Behal has experience with siting and permitting of Transmission and Distribution facilities including representing the client in front of regulatory and public agencies. Mr. Behal is a creative problem solver with a keen ability to resolve project issues.

SECTORS OF EXPERTISE

Power	› Power Transmission and Distribution
Oil & Gas	› Petroleum Refining; Petrochemicals
Additional Expertise	› Due Dilligence; Building & Leading Multi-disciplined Teams; Contract Negotiation and Management

EDUCATION

2017	Master of Business Administration, Simon Business School , University of Rochester, Rochester, New York, United States
2011	Master of Science in Electrical and Computer Engineering (Power Systems), Worchester Polytechnic Institute, Worchester, Massachusetts, United States
2009	Graduate Certificate in Power Systems, Worchester Polytechnic Institute, Worchester, Massachusetts, United States
1999	Bachelor of Civil Engineering, Maharaja Sayajirao University, Baroda, Gujarat, India
1995	Diploma in Civil Engineering, Maharaja Sayajirao University, Baroda, Gujarat, India

Years of Experience

› 16 years

Years with SNC-Lavalin

› 6 years

Key Positions

› Project Manager
› Senior Project Manager

Languages

› English
› Hindi

GIRISH BEHAL, PMP

SNC·LAVALIN

EXPERIENCE

SINCE 2011

SNC-LAVALIN, ROCHESTER, NEW YORK, UNITED STATES

Power Transmission & Distribution - Montreal

Since 2015

Senior Project Manager – Strategic Initiatives

Lead and Manage Project Development in the area of onshore and offshore Renewables, portfolio management of key projects in the area of FERC 1000, Inter-regional transmission planning mandates and strategic due diligences
Lead, Mentor and Manage multi-location and multi-cultural project teams for Project Execution
Grow, maintain and manage client relationships
Create cross functional teams to address client needs
Support Organization's key strategic growth initiatives

Offshore Wind Development , Preliminary engineering, Confidential, New York, United States (07/2017 - present)

Project Manager, SPP-MISO Interregional Model Development , Strategic Planning, Confidential, United States (06/2016 - 02/2017)

The Client Mandated SNC-Lavalin to create an inter-regional system model and perform production cost analysis utilizing PROMOD to evaluate interregional transmission project opportunities for SPP and MISO.

Galloo Island Wind Project,, Planning, Apex, New York, United States (11/2016 - 02/2017)

SNC-Lavalin performed production cost analysis utilizing Promod for the New York State Department of State Article X filing to support the project.

Power Transmission & Distribution - Calgary

2012 - 2015

Senior Project Manager

- Lead, mentor and manage a group of project managers and project teams in the planning, execution and management of a portfolio of mid to large size brown field and green field substation and transmission line capital projects.
- Managed team to deliver CAPEX portfolio value of $58.9M, $51.3M and $67.4M for the years 2012, 2013 and 2014 to the client.
- Recruit and retain project team members including Project Managers, Construction and Commissioning Managers, Engineers and Project Support staff.
- Direct project leadership on specific projects.
- Maintain and manage client relationships for a portfolio of projects currently managed by SNC-Lavalin.
- Support marketing and business development efforts as needed.

Project Manager, Station 124 Phase Shifting Transformer, Project Management, Iberdrola USA, Penfield, New York, United States, CA $34 000 000 (03/2012 - 08/2014)

The project involved engineering, procurement and construction of two (2) 115 kV, + 20% Phase Shifting Transformers, 138/184/230 MVA at station 124 in RG&E territory

Site Experience

- India
- United States

Computer Applications

- Primavera
- Microsoft Project
- Microsoft office suite
- Lotus Notes
- SAP
- Autocad

to comply with FERC ruling. The project was required to support 20% increase in the power output from the interconnected Nuclear station facilities. This project involved major expansion of existing facilities. The substation (Station 124) also required significant Federal State and Local environmental permitting.

- Completed Project ahead of schedule and under budget.
- Completed complex outage during the nuclear unit outage and avoiding future outages that would require down powering of the unit.

Rochester Gas and Electric Program Portfolio, Project Management, Iberdrola USA, New York, United States (03/2012 - 12/2014)

Managed a group of Project Managers to deliver a portfolio of projects to the Client at various voltages and various stages of project lifecycle. The team delivered variety of projects from substation upgrades to major expansions of the transmission and distribution system.

Delivered CAPEX portfolio value of $58.9M, $51.3M and $67.4M for the years 2012, 2013 and 2014 to the client.

Station 124 Static Var Compensator , Project Management, Iberdrola USA, Penfield, New York, United States, CA $30 500 000 (04/2012 - 08/2013)

Engineer, procure and construct a -100/+200 MVAR Static Var Compensator (SVC) at Station 124 to provide reliability support in the area. The SVC is installed at 14kV and connected to the 115 kV system through two (2) 200 MVA transformers. This project involved significant expansion of existing Station 124 resulting in needs for Federal, State and local environmental permitting.

- Completed the project on schedule and on budget
- Negotiated savings to the tune of US$ 140K for the client on change orders for the contractors
- Resolved significant technical design issues to ensure the functionality of the system being installed.

2011 - 2012 | **Project Manager**

- Developed project scope, budget and schedule for electrical transmission capital improvement projects.
- Managed and delivered technically complex key projects to the client on schedule
- Built rapport with client's management and staff gaining their trust and confidence.
- Represented the client organization in public and regulatory forums.
- Collaborated with cross functional teams in developing, evaluating and recommending contracts and procurement of equipment and services.
- Assembled and directed a distributed project execution team in a Multi-Office Execution arrangement.

Project Manager, Substation Automation Project , Project Management, Iberdrola USA, Rochester, New York, United States, CA $36 000 000, Multiple (08/2011 - 04/2012)

The project mandate was to create the project scope of work documents, project estimates and project schedule for the client for various automation upgrades for 12 substations. The mandate included pre-conceptual engineering for the project.

- Project estimates and scopes delivered to the client on schedule and on budget.
- Exceeded client CAPEX goals for the project.

University of Rochester Substation Project , Project Management, Iberdrola USA, Rochester, New York, United States, CA $28 000 000, 115 kV/12 kV, 3000 Amp rated substation (08/2011 - 12/2012)

The University of Rochester (U of R) has requested additional supply to be provided by RG&E to serve its projected growth load and resolve reliability issues. The substation will be a new 115 kV/11.5 kV breaker and a half substation with two (2) 115 kV/11.5 kV 70 MVA transformers. Remote work is planned at stations 33, 82, and Mortimer/National Grid for

line protection. Fiber optics will be installed from station 251 to stations 33, 82, and Mortimer for communications.

› Project Option Evaluations completed on schedule and under budget.
› Lead the project team through successful project siting process.

Station 124 Phase Shifting Transformer, Project Management, Iberdrola USA, Penfield, New York, United States, CA $34 000 000 (12/2011 - 12/2012)

The project involved engineering, procurement and construction of two (2) 115 kV, + 20% Phase Shifting Transformers, 138/184/230 MVA at station 124 in RG&E territory to comply with FERC ruling. The project was required to support 20% increase in the power output from the interconnected Nuclear station facilities. This project involved major expansion of existing facilities. The substation (Station 124) also required significant Federal State and Local environmental permitting.

Completed Project ahead of schedule and under budget.
Completed complex outage during the nuclear unit outage and avoiding future outages that would require down powering of the unit.

Station 124 Static Var Compensator Project, Project Management, Iberdrola USA, Penfield, New York, United States, CA $30 500 000, -100/+200 MVAR SVC (12/2011 - 12/2012)

Engineer, procure and construct a -100/+200 MVAR Static Var Compensator (SVC) at Station 124 to provide reliability support in the area. The SVC is installed at 14kV and connected to the 115 kV system through two (2) 200 MVA transformers. This project involved significant expansion of existing Station 124 resulting in needs for Federal, State and local environmental permitting.

› Completed the project on schedule and on budget
› Negotiated savings to the tune of US$ 140K for the client on change orders for the contractors
› Resolved significant technical design issues to ensure the functionality of the system being installed.

Project Manager, Station 124-42-204 Fiber , Project Management, Iberdrola USA, Rochester Area, New York, United States, CA $1 750 000 (12/2011 - 12/2012)

Design, permit, procure and install 24.2 miles of fiber for system protection communication between station 124, 42 and station 204.

Project completed under budget

2004 - 2011 | **NORTHEAST UTILITIES SERVICE COMPANY, BERLIN, CONNECTICUT, UNITED STATES**

Transmission Business Projects

2006 - 2011 | **Project Lead**

› Responsible for development of project scope, budget, schedule performance for assigned electrical transmission capital improvement projects.
› Responsible for representing the organization in public and regulatory forums.
› Responsible for assembling and leading a diverse, multifunctional project team consisting of internal company employees, contractors, consultants to effectively and efficiently deliver projects on time.
› Responsible for establishing outage dates and coordinating outages with system operators and the outage teams.
› Responsible for creating detailed project schedules, including identification of major milestones, for overseeing, controlling, communicating and managing all activities required to complete assigned transmission system capital improvement projects.
› Responsible for monitoring and controlling project costs through preparation of monthly cash flows, verification of actual or committed costs to estimated costs and identification of cost variances that require further action to ensure

completion within budget.
› Responsible for working with cross functional teams in developing, evaluating and recommending construction contracts and procurement of high value project specific equipment and services.

Project Manager, Hollow Core and Obsolete Equipment Replacement Program, Project Management, Northeast Utilities (CL&P and WMECO), Multiple, Connecticut, United States, CA $170 000 000, 115 kV/345-kV (10/2010 - 05/2011)

This program was a five year system wide equipment replacement program which involved replacment of obsolete equipment in both 115-kV and 345-kV systems across 80 plus substations in two operating companies owned by Northeast Utilities.

› Created an extensive program execution plan
› Managed and negotiated long term outage plan for multiple stations
› Managed and negotiated work agreements with union workforce

Project Manager, Sherwood Substation, Project Management, Northeast Utilites (CL&P), Westport, Connecticut, United States, CA $23 860 000 (03/2010 - 05/2011)

Build a new greenfield substation 115-13.8 kV to support local load growth. The project involved tapping into the existing 115-kV lines and adding two 115-13.8 kV auto-transformers and four switchgear units.

› Successfully lead the permitting of the new Substation
› Managed critical relationships with neighboring property owners

Project Manager, IEC 61850 Simulator Laboratory Program, Project Management, Northeast Utilities, Berlin, Connecticut, United States, CA $2 500 000 (04/2009 - 08/2010)

Design and implement a prototype IEC 61850 technology laboratory to create standards and implementation across the Northeast Utilities organization. This project involved a new technology for the organization, significant organization change and learning implementation in addition to establishment of the laboratory.

› Successfully tested and implemented a new technology

Project Manager, Waterford Substation, Project Management, Northeast Utilities, Waterford, Connecticut, United States, CA $25 000 000 (08/2007 - 05/2010)

Build a new greenfield substation 115-27.6 kV to support local load growth. The project involves tapping into the existing 115-kV lines and adding two 115-27.6 kV auto-transformers.

› Successfully led the project team through permitting process.
› Complex remote end work completed within the tight project schedule.

Project Manager, Critical Infrastructure Protection program, Project Management, Northeast Utilities, Connecticut, United States, CA $24 000 000 (02/2008 - 05/2009)

This project involves creating separate communication networks, modifications to existing systems and enhancing physical security for critical cyber assets across three states (Service Territories).

› Completed project under budget and on schedule
› Ensured compliance with regulatory requirements
› Managed multi-locational teams

Project Manager, Ludlow Auto Transformer Replacement , Project Management, Northeast Utilities, Ludlow, Massachusetts, United States, CA $10 250 000, 345 kV (09/2007 - 12/2009)

Design, procure and install three-single phase 200 MVA units at Ludlow in spare position for connections at a later date.

› Project Completed on schedule and budget.

Project Manager, Wilton Substation, Project Management, Northeast Utilities, Wilton, Connecticut, United States, CA $11 500 000 (11/2006 - 05/2008)

Build a new greenfield 115-27.6 kV Substation for local load growth. The project involves tapping into the existing 115-kV lines and adding two 115-27.6 kV auto-transformers. The most unique part of the project is extremely small construction site bordered by wetlands with species of special concern.

› Complex construction due to limited space.

Project Manager, Devon Substation Upgrade Project , Project Management, Northeast Utilities, Milford, Connecticut, United States, CA $8 520 000, 115-kV (04/2006 - 10/2008)

The project involves replacement of existing equipment and addition of new equipment for increase in thermal ratings and reliability of the station. The most unique part of the project is to enable reliable supply to the distribution system downstream with multiple
concurrent and overlapping equipment outages.

› Completed complex outage schedule (72+ outages) with Zero incidents
› Negotiated and awarded lumpsum construction contract for construction resulting in change orders less than 3% of the contract value.

Assistant Project Manager, Bethel to Norwalk Project , Project Management, Northeast Utilties , Connecticut, United States, CA $397 000 000 (01/2006 - 08/2006)

Build a new 345-kV overhead and underground Transmission line between Danbury, CT and Norwalk CT with two transition stations. Reconductor and upgrade existing 115 kV lines. Build new 115 kV line. Install two 400MVA shunt reactors to the system. Build extensive upgrades and expansions for Substations in Norwalk CT and Danbury CT including two new 345-kV GIS substations.

2005 - 2006 | *Transmission Business Projects*
Associate Engineer/Project Lead

› Responsible for development of project scope, budget, schedule performance for assigned electrical transmission capital improvement projects.
› Responsible for representing the organization in public and regulatory forums.
› Responsible for assembling and leading a diverse, multifunctional project team consisting of internal company employees, contractors, consultants to effectively and efficiently deliver projects on time.
› Responsible for establishing outage dates and coordinating outages with system operators and the outage teams.
› Responsible for creating detailed project schedules, including identification of major milestones, for overseeing, controlling, communicating and managing all activities required to complete assigned transmission system capital improvement projects.
› Responsible for monitoring and controlling project costs through preparation of monthly cash flows, verification of actual or committed costs to estimated costs and identification of cost variances that require further action to ensure completion within budget.
› Responsible for working with cross functional teams in developing, evaluating and recommending construction contracts and procurement of high value project specific equipment and services.

Assistant Project Manager, Bethel to Norwalk Project , Project Management, Northeast Utilities, Connecticut, United States, CA $397 000 000, 115-kV, 345-kV (09/2005 - 08/2006)

Build a new 345-kV overhead and underground Transmission line between Danbury, CT and Norwalk CT with two transition stations. Reconductor and upgrade existing 115 kV lines. Build new 115 kV line. Install two 400MVA shunt reactors to the system. Build extensive upgrades and expansions for Substations in Norwalk CT and Danbury CT including two new 345-kV GIS substations.

2004 - 2005 | *Transmission Business Projects*
Assistant Engineer

- Complete responsibilities for assigned portions of project management responsibilities.
- Assist Project Manager in developing and evaluating construction contracts and procurement of high value items like Shunt Reactors.
- Assist Project Managers in managing overall scope, budget and schedule of high profile electrical transmission projects including schedule adherence, project communications and projects engineering, design and construction services.
- Coordinate project team efforts with maintenance for project turnover to maintenance.
- Perform technical and commercial review and provide recommendation to the management for project changes.
- Performed first line technical and commercial approval of contractor invoices.
- Performed technical and commercial review of bids.

Assistant Project Manager, Bethel to Norwalk Project , Project Management, Northeast Utilities, Connecticut, United States, CA $397 000 000 (2004 - 09/2005)

Build a new 345-kV overhead and underground Transmission line between Danbury, CT and Norwalk CT with two transition stations. Reconductor and upgrade existing 115 kV lines. Build new 115 kV line. Install two 400MVA shunt reactors to the system. Build extensive upgrades and expansions for Substations in Norwalk CT and Danbury CT including two new 345-kV GIS substations.

2003 - 2004 | **CURTIS PARTITION CORP, NEW YORK, NEW YORK, UNITED STATES**
Project Engineer

- Assist project managers in daily field operations including manpower allocations, create and track RFI's submitted to GC, attend project meetings, prepare project catch-up plans.
- Evaluate general contractor schedule, prepare resource-loaded schedule for the company to assist in manpower optimization.
- Evaluate new project management softwares and recommend project management software for organization wide implementation.

1999 - 2001 | **LARSEN & TOUBRO LTD, BARODA, GUJARAT, INDIA**
Project Engineer

- Assisted project manager in preparation of project progress reports, scheduling, schedule updating, vendor follow up and contractor invoice processing.
- Assisted project manager in consolidating change order documentation.
- Coordinated with client/owner's engineers, detail engineering contractor, site engineering for design review and drawing submittal etc. at design/build refinery project site.
- Reviewed and processed site and contract related drawings and documentation (RFI's).
- Construction observation, inspection and issuance of rectification "punch lists".
- Assisted engineering manager in project engineering issues, including discussions and clarifications of contractual and technical issues with detail engineering subcontractor for shop drawings review.
- Provided field support for preparation of "As-Built" drawings.
- Technical discussions and clarifications with engineering and vendor as required.

Assistant Project Manager, Milk Powder Plant and Liquid Milk Plant expansion Project, Project Management, National Dairy Development Board (NDDB), Banaskantha, Gujarat, India, CA $29 540 000 (08/2000 - 07/2001)

This project was an Engineering Procurement and Construction contract for design, supply and construction Liquid Milk Plant (35MMTPA) and Milk Powder plant (20MMTPA). This was expansion project.

Assistant Project Manager, Hydrogen plant, De-Hydrogenisation De-sulphurisation plant, Offsite and Utilities Package, Project Management, Hindustan Petroleum Corporation Limited, Vishakhapatnam, Odisha, India, CA $261 000 000 (07/1999 - 09/2000)

: This project was an Engineering Procurement and Construction contract for design, supply and construction of Hydrogen plant, De-Hydrogenisation De-sulphurisation plant including all related offsite and Utilities as needed for Plant operation.

PROFESSIONAL ASSOCIATIONS

SINCE 2015	Institute of Electrical & Electronic Engineers, Membership no. 93512798
SINCE 2007	Project Management Institute (PMI), Membership no. 1021284

PROFESSIONAL DEVELOPMENT

2007	Certificate in Project Management, Boston University, Boston, Massachusetts, United States
2007	Project Management Professional, Project Management Institute, Newtown Square, Pennsylvania, United States

ADDITIONAL TRAINING

2013	Leadership Training, Knightsbridge, Toronto, Ontario, Canada

PUBLICATIONS AND PRESENTATIONS

HVDC - Powering the Future, Rochester, United States, 2017

Eroding Values and Emerging Ethical Issues in contemporary Indian Management, Baroda, Gujarat, India, 2000

Environmental Impact Assessment Methodologies: Critical Review, Jhansi, Uttar Pradesh, India, 1998

COMMITTEES

SINCE 2015	WG 15.05.08 HVDC and FACTS Economics and Operating Strategies, United States
SINCE 2015	WG 15.05.18 Studies for Planning of HVDC
SINCE 2015	WG 15.05.19 Practical Technologies for VSC HVDC Systems

DIRECTORSHIPS

SINCE 2017	Co- Vice Chair

AWARDS AND SCHOLARSHIPS

2015	The Simon School of Business Scholarship (25% tuition fees), University of Rochester, Rochester, New York, United States
2001	University Fellow, The Ohio State University, Columbus, Ohio, United States
2000	First place in Young Managers Competition, Baroda Management Association, Baroda, Gujarat, India
1999	Express Group Gold Medal, The Maharaja Sayajirao University, Baroda, Gujarat, India
1999	Shri K H Patel Gold Medal , The Maharaja Sayajirao University, Baroda, India
1999	Late Friend (Dr.) Piyush Parikh Gold Medal Fund, The Maharaja Sayajirao University of Baroda, Baroda, India

ACADEMIC POSTS

2002 - 2003	Graduate Research Assistant , The Ohio State University, Columbus, Ohio, United States

PUBLIC HEARINGS

2013	Station 251 Project, Town of Brighton Planning Board, Brighton, New York, United States
2011	Station 124 Expansion Project, Town of Penfield, Planning and Zoning Commission, Penfield, New York, United States
2010	New 115-kV substation in Westport,CT, Connecticut Siting Council, Westport, Connecticut, United States
2010	115-kV Circuit Separation Project, Massachusetts Department of Public Utilities, Boston, Massachusetts, United States
2008	New 115-KV Substation in Waterford, CT, Connecticut Siting Council, Waterford, Connecticut, United States
2006	New 115 kV/11.5 KV substation, Connecticut Siting Council, New Britain, Connecticut, United States

STATE OF NEW YORK
PUBLIC SERVICE COMMISSION

Application of Galloo Island Wind Transmission Facility for a Certificate under Article VII of the Public Service Law

Case No. 18-T-0015

PRE-FILED TESTIMONY OF:

CHRISTOPHER FERRELL

Q: Please state your name, employer, and business address.

A: Christopher Ferrell, Mott McDonald, 1435 W. Morehead Street, Suite 140, Charlotte, NC 28208.

Q: What is your position at Mott MacDonald?

A: I am a Vice President.

Q: How long have you been employed with Mott MacDonald?

A: I have been employed with Mott MacDonald since 2016.

Q: Please describe your educational background and professional experience.

A: Bachelor of Science in Electrical Engineering (1999) from North Carolina State University, Masters of Business Administration (2005) from Wake Forest University. I have worked in the electrical utility industry in various roles for approximately 12 years. These roles have varied from electrical engineer, project manager, project director, business line director, and vice president.

Q: Please describe your current responsibilities with Mott MacDonald.

A: As of January 1, 2018, my role as vice president within the energy group of Mott MacDonald, power delivery business line, is to ensure the successful execution of client projects and continued operations of the business line.

Q: **Have you previously testified before the New York State Public Service Commission or Siting Board on Electric Generation?**

A: No.

Q: Have you previously served as an expert witness before any other court, agency, or other body on the subject you plan to offer testimony on today?

A: No.

Q: What is the purpose and scope of your testimony in this proceeding?

A: To sponsor certain portions of the Galloo Island Wind Transmission Facility Application or the Exhibits thereto.

Q: What portion(s) of the Application is your testimony sponsoring?

A: Exhibit 5.

Q: Were these Exhibits, Application sections, or studies prepared by you or under your direction and supervision?

A: Yes.

Q: In your testimony, will you refer to, or otherwise rely upon, any studies, publications, data or documents produced by persons other than yourself/your company? If so, please cite these sources. [These are independent studies, etc.]

A: Yes, appendices referenced in the section of the Application that I am sponsoring as set forth above.

Q: Does this conclude your testimony?

A: Yes.

MOTT MACDONALD

Summary Resume

Christopher Ferrell
Vice President
Power Delivery

Personal summary

Education:

MBA Finance, Information Technology

BS Electrical Engineering

Registrations:

Professional Engineer: NC

Professional memberships:

Project Management Professional (PMP)

Member of Board of Directors of Advanced Energy

Mr. Ferrell has several years of project management, business and engineering experience working on transmission, modelling, distribution, and substation projects. These have included underground and overhead transmission and distribution, SCADA plant controllers, fiber optic communications systems, relay coordination, and overall project modelling efforts. He has been involved in project development, preliminary and full plant design, interconnection studies and filings, expert witness filings, and ongoing operations and maintenance support for projects across the country. With voltages ranging up to 500kV and experience in most states, Chris is recognized as having the ability to tackle complex projects and problems and pull together team-centered, value driven solutions. Throughout his career, his resourcefulness, diverse background and education, and creativity have enabled him to solve challenges he has faced with his projects.

Experience and skills

MOTT MACDONALD USA LLC (2017 – Present)	Vice President
MOTT MACDONALD USA LLC (2016 – 2017)	Business Line Director

Selected projects

Stillwater 2 Solar: Engineering support and review for a 20MW solar facility with a 69kV underground and overhead transmission line, 20MW collection station, overall site SCADA / RTU and communications systems, full site modelling, and 69kV POI station. Shared POI with an adjacent solar facility and a geothermal plant.

Mount Signal 3 Solar: Engineering support and review for the full electrical and civil substation design, project compliance modelling, SCADA / RTU / Communication design, overhead collection system, and overall site modelling for a 253 MW solar project.

Twin Buttes II Wind (75MW): Project Director and Engineering Support for OH and UG collection system design and review, dynamic & static project modelling for incorporating a new wind project into ~150MW of existing wind generation with a shared 55 mile, 230kV TL. Project included 7MVAR STATCOM for control of the entire 225MW facility.

El Cabo Wind (300MW): Project Director and Engineering Support for OH and UG collection system design and review, including dynamic & static project modelling for a total of 128 MVAR of static compensation and harmonic filters.

Iron Horse Solar and Storage (2MW/10MWhr): Project Director for hybrid solar and storage plant switchgear, protection and control, relay settings and physical design.

Blue Cloud I Wind (150MW): Project director for 230kV transmission line, electrical and civil substation design, Reactive Compliance Modelling, FERC Compliance, underground collection system, overall site modelling, project SCADA/RTU, Communications and HMI programming.

Canadian Breaks Wind (210MW): Project director for 345kV transmission line, electrical and civil substation design, ERCOT Reactive Compliance Modelling, FERC Compliance, underground collection system, SCADA / HMI / Communications system design, overall site modelling (dynamic and static).

Legacy Experience

Los Vientos I-V (910MW): 138kV and 345kV transmission lines, electrical and civil substation design, ERCOT Reactive Compliance Modelling, Sub synchronous Control Interaction Modelling, 3MW black start generator, FERC Compliance, Site Civil Access Road, WTG foundation design, collection system, overall site modelling.

Twin Ridges: 138kV, 10 mile OH / UG Transmission Line: Project Manager for full civil, electrical, thermal modelling, directional bore, and civil engineering efforts, CPCN/CCN Permitting, EMF Study, Townhall Presentations, and Expert Testimony.

Various Wind Project (3,500MW+): Experience as Project Manager and Senior Engineer for various, operating wind projects, including 66-345kV transmission line design, electrical and civil substation design, FERC Compliance, CPCN and Public Testimony, OH and UG Collection System Design, and Overall Site Modelling. ERCOT, SPP, PJM, MISO, & CALISO

STATE OF NEW YORK
PUBLIC SERVICE COMMISSION

Application of Galloo Island Wind Transmission Facility for a Certificate under Article VII of the Public Service Law

Case No. 18-T-0015

PRE-FILED TESTIMONY OF:

NEIL HABIG

SENIOR DIRECTOR PROJECT DEVELOPMENT—NORTHEAST

APEX CLEAN ENERGY

Q: Please state your name, employer, and business address.

A: Neil Habig, Apex Clean Energy, Court Square Building, 310 4th Street NE, Suite 200, Charlottesville, VA 22902.

Q: What is your position at Apex?

A: Senior Director of Project Development, Northeast.

Q: How long have you been employed with Apex?

A: I have been employed with Apex since 2015.

Q: Please describe your educational background and professional experience.

A: I have a Bachelor of Science in Mechanical Engineering from Villanova University and a Master of Science in Telecommunications Management from Stevens Institute of Technology. I also have a Masters Certificate in Project Management from George Washington University. I have approximately 15 years' experience in the wind energy industry, 13 of which have been spent overseeing development of wind energy projects in the Northeast. I also have an additional 16 years' experience in the telecommunications field. Please see attached for my curriculum vitae.

Q: Please describe your current responsibilities with Apex.

A: I am responsible for managing development of the Galloo Island Wind Energy Facility and leading the Northeast Development Team for Apex. In that capacity, I am responsible for overseeing environmental assessment and permitting activities in conjunction with wind energy project development.

Q: Have you previously testified before the New York State Public Service Commission or Siting Board on Electric Generation?

A: No.

Q: Have you previously served as an expert witness before any other court, agency, or other body on the subject you plan to offer testimony on today?

A: Yes. In 2009 I testified before the Vermont Public Service Board on similar topics in connection with a Section 248 proceedings for the Deerfield Wind Project.

Q: What is the purpose and scope of your testimony in this proceeding?

A: To sponsor certain portions of the Galloo Island Wind Transmission Facility Application or the Exhibits thereto.

Q: What portion(s) of the Application is your testimony sponsoring?

A: Exhibits 1, 2, 4.2, 9 and E-1, E-2, E-3, E-4.1 to E-4.3, E-5 (excluding second paragraph) and E-6.

Q: Were these Exhibits, Application sections, or studies prepared by you or under your direction and supervision?

A: Yes.

Q: In your testimony, will you refer to, or otherwise rely upon, any studies, publications, data or documents produced by persons other than yourself/your company? If so, please cite these sources. [These are independent studies, etc.]

A: References are provided in the corresponding Exhibits and Reports.

Q: Does this conclude your testimony?

A: Yes.

Neil Habig
330 Province Line Road
Skillman, NJ 08558

Email: neil.habig@apexcleanenergy.com
Mobile: (609) 933-4293

SUMMARY

Experienced Project Developer with track record for successfully developing and leading infrastructure projects against challenging schedule and budget constraints.

PROFESSIONAL EXPERIENCE

APEX CLEAN ENERGY **2015-PRESENT**

Senior Director Project Development – Northeast
Managing development of the Galloo Island Wind Farm and leading Northeast Development team

HUDSON ENERGY DEVELOPMENT **2014-2015**

VP Development
Principal of a development company responsible for developing Galloo Island Wind Farm in Jefferson Count NY. Leading all aspects of project development.

IBERDROLA RENEWABLES/PPM ENERGY/AREC, PORTLAND OR **2003-2014**

Lead/Senior Developer, New England Region
Lead project development and project management activities for early through late stage wind farm development opportunities in MA, VT, NY, and ME. Activities included all aspects of development focusing on team leadership, permitting, estimating, financial modeling, interconnection, site layout and optimization, real estate control, tax agreement negotiation, community outreach, vendor management and schedule management.

- Lead development of 74 MW facility from early land control stage through construction. In service December 2010.
- Completed development of 30 MW facility in Western MA – early permitting through construction. In service December 2012.
- Leading development activities in New England on early and late stage development projects.
- 2003/2004 - Lead an offshore wind energy feasibility study supported by state BPU grant. Negotiated grant agreement. Performed detailed financial modeling, siting assessment, jurisdictional and permitting assessment. Managed various subcontractor's efforts in conducting study.

CLIPPER WINDPOWER, Carpenteria, CA **2002-2003**

Project Manager/Developer

Worked on green field development, proposal development, Project Office development, planning, permitting, land control, public outreach, and contract management. Particular focus on offshore regulatory environment and opportunity development.

TYCO TELECOMMUNICATIONS, Morristown, NJ **1990 to 2002**

Director, Project Management, Tyco Global Network, Pacific Region (2000-2002)
Led project implementation for $2 billion undersea fiber system linking the US with Japan and South East Asia. Responsibilities included leading a cross functional implementation team; managing change control, budget and schedule; supplier management; optimization studies, network topology and regulatory issues.

- Applied best management practices and ensured project ran on schedule and under budget.
- Developed and implemented configuration optimizations resulting in more than $240 million of savings in system cost.
- Developed project reporting practices adopted organization wide for their enhanced readability, organization and efficiency.

Director, Project Management, Pacific Crossing Network (1998-2000)
Led project implementation for construction of $1.4 billion undersea fiber system linking Japan and the US. Tyco was lead contractor to Global Crossing Ltd. Responsibilities included principal customer interface; leading a cross functional implementation team; managing change control, budget and schedule; managing $750 million subcontract to Japanese subcontractor.

- Delivered project ahead of schedule and under budget.
- Developed and directed critical schedule mitigation strategies to ensure system was completed ahead of schedule qualifying Tyco for $48 million schedule bonus.

Senior Project Manager, Undersea Systems Division (1995-1997)
Led project implementation of multiple international undersea cable systems in the Caribbean, Middle East and Europe. Responsibilities included leading cross functional project team, oversight of schedule development and tracking using MS Project; budget management and reporting; reporting to senior management and external customers.

- Developed a scheduling practices guide for the organization which standardized schedule organization, logic conventions, report appearance and tracking and maintenance standards
- Selected to appear in promotional video for Microsoft Project software.
- Selected for corporation's Leadership Continuity Program, a fast track career development program for top 2% of management.

Project Manager, Undersea Systems Division (1992-1995)
Project manager supporting deployment efforts for several transoceanic fiber cable systems. Responsibilities included schedule development and tracking, budget development and tracking, preparation of in depth project reporting for management and external customers

Training Developer, Undersea Systems Division (1990-1991)

Developed a training curriculum for Division personnel. Developed and delivered an in depth course on undersea fiber optic cable systems technology.

AT&T CORP., Hopewell, NJ **1986 to 1990**

Program Manager, AT&T Engineering Research Center (1989-1990)
Led development team in development of pioneering 3D machine vision system for use in circuit board manufacturing. Responsibilities included writing product requirements and design specifications, research and development of vision algorithms, software development,

Design Engineer, AT&T Manufacturing Development Center (1986-1988)
Mechanical designer of robotic manufacturing systems. Work focused on machine vision systems for use in AT&T factories. Responsibilities included machine design, product development, and product management, customer interface, manufacturing engineering, project management and technical writing.

EDUCATION

Master of Science in Telecommunications Management
Stevens Institute of Technology, Hoboken NJ
Graduated with distinction.

Bachelor of Science in Mechanical Engineering
Villanova University, Villanova PA

Masters Certificate in Project Management
George Washington University, Washington DC

EXTRA CURICULAR

President – Princeton Youth Hockey Association Board of Directors

STATE OF NEW YORK
PUBLIC SERVICE COMMISSION

Application of Galloo Island Wind Transmission Facility for a Certificate under Article VII of the Public Service Law

Case No. 18-T-0015

PRE-FILED TESTIMONY OF:

PATRICK J. HEATON

ENVIRONMENTAL DESIGN & RESEARCH,

LANDSCAPE ARCHITECTURE, ENGINEERING & ENVIRONMENTAL SERVICES, D.P.C.

Q: Please state your name, employer, and business address.

A: Patrick J. Heaton, Environmental Design & Research, Landscape Architecture, Engineering & Environmental Services, D.P.C. (EDR), 217 Montgomery Street, Suite 1000, Syracuse, New York 13202.

Q: What is your position at EDR?

A: I am a Principal and Director of Cultural Resources Services.

Q: How long have you been employed with EDR?

A: I have been employed with EDR since 2010.

Q: Please describe your educational background and professional experience.

A: I hold a Master of Arts in Anthropology from New York University and Bachelor of Arts in Anthropology from Hartwick College. I am a Registered Professional Archaeologist and satisfy the Professional Qualifications for Archaeology and Historic Preservation per the U.S. Secretary of Interior's Standards for Historic Preservation Projects (36 CFR Part 61). I have over 17 years of experience conducting cultural resources investigations and visual impact assessments for a variety of energy generation and transmission projects. Additional information on my experience is presented in my curriculum vitae, a copy of which is attached.

Q: Please describe your current responsibilities with EDR.

A: As a Principal within EDR's Environmental Division, I oversee all aspects of the firm's projects related to cultural (i.e., archaeological and historic) resources, as well as managing environmental permitting projects. I am responsible for managing cultural resources surveys and visual impact analyses on behalf of EDR's clients. I have over 17 years of experience performing and/or supervising projects involving cultural resources, environmental impact assessments, visual impact assessments, natural resource management plans and recreation planning.

Q: **Have you previously testified before the New York State Public Service Commission or Siting Board on Electric Generation?**

A: Yes. I provided testimony to the New York State Public Service Commission (PSC) regarding the cultural resources investigations conducted for the Central Hudson A and C Line Rebuild Project. More recently, I provided testimony before the PSC in conjunction with the pending Cassadaga Wind Project application.

Q: Have you previously served as an expert witness before any other court, agency, or other body on the subject you plan to offer testimony on today?

A: Yes, I have provided testimony to the New York State Public Service Commission (PSC) regarding the cultural resources investigations conducted for the Central Hudson A and C Line Rebuild Project. More recently, I provided testimony before the PSC in conjunction with the pending Cassadaga Wind Project application. In addition, I provided testimony before the Public Service Commission of Maryland regarding the review of environmental impacts (including cultural resources and visual impacts) for the Great Bay Solar I Project.

Q: What is the purpose and scope of your testimony in this proceeding?

A: To sponsor certain portions of the Galloo Island Wind Transmission Facility Application or the Exhibits thereto.

Q: What portion(s) of the Application is your testimony sponsoring?

A: Exhibit 4.10.

Q: Were these Exhibits, Application sections, or studies prepared by you or under your direction and supervision?

A: Yes.

Q: In your testimony, will you refer to, or otherwise rely upon, any studies, publications, data or documents produced by persons other than yourself/your company? If so, please cite these sources. [These are independent studies, etc.]

A: Yes, appendices referenced in the section of the Application that I am sponsoring as set forth above.

Q: Does this conclude your testimony?

A: Yes.

Patrick J. Heaton, RPA
Principal, Director of Cultural Resources

education

New York University, New York, New York, *Master of Arts in Anthropology*, 1999.

Hartwick College, Oneonta, New York, *Bachelor of Arts in Anthropology*, 1994.

professional affiliations

Registered Professional Archaeologist (RPA), 2000

Meets the Secretary of Interior's Standards for Historic Preservation Projects (36 CFR Part 61)

Vice-President, Board of Directors, Preservation Association of Central New York (PACNY)

Member, Council for Northeast Historical Archaeology

Member, New York Archaeological Council

Member, New York State Archaeological Association (NYSAA), William M. Beauchamp Chapter

Executive Board (2006-2007), Professional Archaeologists of New York City (PANYC)

employment history

Principal and Director of Cultural Resources Services, Environmental Design & Research, Landscape Architecture, Engineering and Environmental Services, D.P.C., 2013 to Present.

Project Manager, Environmental Design & Research, Landscape Architecture, Engineering and Environmental Services, D.P.C., 2010 to 2013.

Associate, Principal Archaeologist, and Project Manager, John Milner Associates, Inc., Croton-on-Hudson, NY, 2004 to 2010.

Project Archaeologist, John Milner Associates, Inc., Croton-on-Hudson, New York, 2000 to 2004.

Graduate Teaching Assistant, Anthropology Department, New York University, 1997 to 2000.

Research Consultant, Sass Conservation, Inc., Yonkers, New York, 1998 to 2000.

Archaeological Field Technician, Various Firms, New York, Rhode Island, Massachusetts, Pennsylvania, Connecticut, 1995 to 1997.

publications/presentations

Presenter. It's a Brave New World: Online Consultation with the New York State Historic Preservation Office (SHPO). 2015 New York State Wetlands Forum Conference, Syracuse, NY. April, 2015.

Poster Presentation. The Effect of Larger Rotor Diameters and Taller Hub Heights on Shadow Flicker Impacts. 2013 American Wind Energy Association (AWEA) Wind Conference, Chicago, IL. May, 2013.

Presenter. Cultural Heritage Planning: History as a Marketable Asset. Annual Conference of the New York Upstate Chapter of the American Planning Association, Corning, NY. September, 2012.

Presenter. Use of Visualization Techniques and Computer Graphics to Address the Visibility and Appearance of Off-shore Wind Projects. 2011 AWEA Offshore Wind Conference, Baltimore, MD. October, 2011.

Heaton, Patrick J., J. Sanderson Stevens, L.E. Branch-Raymer, & J. Wettstaed. 2010. Archaeological Investigations of an Early Farmstead Site in Shelby County, Indiana. Indiana Archaeology 5(2):74-95.

Heaton, Patrick J. 2003. The Rural Settlement History of the Hector Backbone. Northeast Historical Archaeology 32:19–28.

Heaton, Patrick J. 2003. Farmsteads and Finances in the Finger Lakes: Using Archival Sources in a GIS Database. Northeast Historical Archaeology 32:29–44.

Six, Janet, Patrick J. Heaton, Susan Malin-Boyce, & James A. Delle. 2003. The Artifact Assemblage from the Finger Lakes National Forest Archaeology Project. Northeast Historical Archaeology 32:79–94.

Delle, James A., & Patrick J. Heaton. 2003. The Hector Backbone: A Quiescent Landscape of Conflict. Historical Archaeology 37(3):93-110.

Heaton, Patrick J. 2000. Book review of Nineteenth- and Early Twentieth-Century Domestic Site Archaeology in New York State, edited by John P. Hart and Charles L. Fisher, New York State Museum Bulletin No. 495, Albany, NY, 2000. Published in Northeast Anthropology 60:93-94.

project experience

Interstate 81 (I-81) Viaduct Project – Archaeological Assessment – Project Manager for Phase 1A Archaeological Sensitivity Assessment and Section 106 of the National Historic Preservation Act consultation and National Environmental Policy Act (NEPA) review as part of a consultant team with Parsons and AKRF, Inc. on behalf of the New York State Department of Transportation (NYSDOT) for the replacement of approximately 5 miles of elevated highways through the City of Syracuse, Onondaga County, NY (NYSDOT PIN 3501.60, D031085). Coordinated State Historic Preservation Office (SHPO) consultation and assisted with public outreach events/meetings and preparation.

Interstate 81 (I-81) Viaduct Project – Visual Impact Assessment – Project Manager for Visual Impact Assessment conducted in accordance with Federal Highway Administration (FHWA) Visual Impact Assessment protocol as part of NEPA review as part of a consultant team with Parsons, AKRF, Inc., and TWMLA for the replacement of approximately 5 miles of elevated highways through the City of Syracuse, Onondaga County, NY (NYSDOT PIN 3501.60, D031085).

Great Bay Solar I – Principal-in-Charge and Project Manager for environmental permitting studies in support of Maryland Public Service Commission review for a Certificate of Public Convenience and Necessity (CPCN), including preparation of an Environmental Review Document (ERD), wetland delineations, Visual Assessment, Phase 1 Archaeological Survey, Historic Resources Assessment, rare plant survey, wetland permitting, and local permitting for a proposed 100 MW solar energy project located on 800 acres in Somerset County, MD.

Arkwright Summit Wind Farm – Project Manager for environmental permitting for a proposed 36-turbine, 78-megawatt (MW) wind energy facility and associated 3-mile generator lead line in Chautauqua County, NY. Services include managing review under New York State Environmental Quality Review Act (SEQRA), including Lead Agency coordination, preparation of Supplemental Environmental Impact Statement (SEIS), Final Environmental Impact Statement (FEIS), Visual Impact Assessment, shadow flicker analysis, supplemental Phase 1B Archaeological Survey, Historic Resources Assessment, and preparation of Joint Application for Permit for wetland permitting for submission to the U.S. Army Corps of Engineers and New York State Department of Environmental Conservation (NYSDEC).

Solar Development Project (Private Client) – Principal-in-Charge for environmental Critical Issues Analysis and comprehensive Permitting Matrix for utility-scale solar energy project in Worcester County, MD.

Cassadaga Wind Farm – Technical Director for Phase 1 Archaeological Survey, Historic Resources Survey, State Historic Preservation Office (SHPO) consultation, and Visual Impact Assessment in support of Article 10 Application to the New York State Board on Electrical Generating Siting and the Environment for a proposed 70 wind turbine, 126 MW wind energy facility in Chautauqua County, NY.

University at Albany Emerging Technology and Entrepreneurship Complex (ETEC) – Principal-in-Charge and Project Manager for SEQRA review, including preparation of a Scoping Document, Supplement Environmental Impact Statement (SEIS, Phase 1B Archaeological Survey, Visual Assessment, and coordination of traffic study (by sub-consultant) on behalf of the State University Construction Fund (SUCF) for a 12-acre site proposed for new academic building on the New York State Office of General Services (OGS) Harriman Campus in Albany County, NY.

New York State Thruway Authority (NYSTA) Term Contract for Bridge Rehabilitation in Western New York – Principal-in-charge for environmental and cultural resources services to support environmental permitting as part of consultant team with Stantec for NYSTA bridge rehabilitation projects. Services include: preparation of Section 106 Project Submittal Packages; Phase 1A Archaeological Assessments and/or Phase 1 Archaeological Surveys; wetland reconnaissance and/or delineations; rare, threatened, and endangered (RTE) species assessments; Section 4(f) Consultation correspondence; and, the environmental portions of Design Approval Documents.

Onondaga Lake Parkway/NY Route 370 – Principal-in-Charge for environmental permitting studies as part of coordinated SEQRA/NEPA review as part of a consultant team with Lochner for the reconstruction and safety improvements of 2-mile parkway in the City of Syracuse, Onondaga County, NY (NYSDOT PIN 3287.17). Services include wetland delineation and permitting, rare, threatened, and endangered (RTE) species assessments, groundwater modeling, historic landscape inventory, and visual impact assessment.

Onondaga Creekwalk Phase II – Principal-in-Charge for environmental permitting services as part of a consultant team with C&S Engineers for the a 2.2-mile recreational trail along Onondaga Creek in the City of Syracuse, Onondaga County, NY (NYSDOT PIN 355.14). Services provided as part of coordinated SEQRA/NEPA review included: preparation of a Section 106 Project Submittal Package; Phase 1A Archaeological Assessment; rare, threatened, and endangered (RTE) species assessments; Section 4(f) Consultation correspondence; and, the environmental portions of a NYSDOT Design Approval Document.

Interstate 690 (I-690) Teall Avenue & Beech Street Interchange – Project Manager and Technical Director for Visual Assessment and Archaeological Resources Screening as part of National Environmental Protection Act (NEPA) review and Section 106 consultation as part of a consultant team with Parsons and AKRF, Inc. on behalf of the NYSDOT for a bridge replacement and intersection improvement of 0.5-mile elevated highway in the City of Syracuse, Onondaga County, NY.

Canalways Trail – Technical Director for Section 106 Project Submittal Package and Phase 1A Archaeological Assessment as part of a consultant team with CHA for the design and construction of a 2.7-mile recreational trail along the shoreline of Onondaga Lake in the City of Syracuse, Onondaga County, NY (NYSDOT PIN 3950.49).

Penn Forest Wind Farm – Project Manager for preliminary visual assessment, visual fieldwork, viewshed analysis, visual simulations, and preparation of public outreach materials for proposed 40-turbine wind energy facility in Carbon County, PA.

Stiles Brook Wind Farm – Project Manager for preliminary visual assessment, visual fieldwork, viewshed analysis, visual simulations, and preparation of public outreach materials for proposed 30-turbine wind energy facility located in Towns of Windham and Grafton, VT.

Village of Mohawk Substation Relocation – Principal-in-Charge and Project Manager for Phase 1 Archaeological Survey conducted as part of Section 106 of the National Historic Preservation Act consultation for a proposed 1.2-acre substation relocation project in Herkimer County, NY. Project sponsored by New York Governor's Office of Storm Recovery (GOSR) and Federal Emergency Management Agency (FEMA).

Town of Nichols Highway Garage – Principal-in-Charge and Project Manager for Phase 1 Archaeological Survey conducted as part of Section 106 of the National Historic Preservation Act consultation for a 7.0-acre site proposed for relocation of a municipal highway garage in Tioga County, NY. Project sponsored by New York Governor's Office of Storm Recovery (GOSR) and U.S. Department of Housing and Urban Development (HUD).

Jericho Rise Wind Farm – Technical Director for Phase 1B archaeological survey, historic resources survey and effects analysis, and SHPO consultation in support of SEQRA review and U.S. Army Corps of Engineers wetland permitting for a proposed 37 wind turbine, 78 MW wind energy facility in Franklin County, NY.

Liverpool Village Cemetery Long-Term Maintenance and Restoration Plan – Principal-in-Charge for a landscape preservation planning project, associated NYS Consolidated Funding Application (CFA), and public outreach for a 6-acre cemetery listed on the National Register of Historic Places (NRHP) located in the Village of Liverpool, Onondaga County, NY.

Cumberland Bay State Park, Camping Area Comfort Station Replacements – Principal-in-Charge and Project Manager for Phase 1 Archaeological Survey for proposed comfort station replacements in a state park on Lake Champlain in Clinton County, NY. Services provided as part of a consultant team with Beardsley Architects & Engineers, D.P.C. for a Term Services Agreement with the New York State Office of Parks, Recreation, and Historic Preservation (NYSOPRHP).

Montezuma Heritage Park and Giardina Park – Principal-in-Charge and Project Manager for Phase 1A Archaeological Resources Surveys in support of historic preservation planning for a proposed 168-acre heritage park that interprets archaeological remains of the Erie and Cayuga-Seneca Canals and an additional 16-acre town park in the Town of Montezuma, Cayuga County, NY.

Rochester Genesee Regional Transit Authority (RGRTA) Main Street Campus Improvements – Principal-in-Charge and Project Manager for preparation of Phase 1B Archaeological Survey in support of NEPA review of 3-acre transit facility in the City of Rochester, Monroe County, NY.

Galloo Island Wind Farm – Project Manager for preliminary visual assessment, viewshed analyses, visual simulations, preparation of public outreach graphics, and public meeting support for proposed 30-turbine wind energy facility located on an island in Lake Ontario in Jefferson County, NY.

Binghamton University School of Pharmacy - Principal-in-Charge and Project Manager for SEQRA review (including preparation of a Full Environmental Assessment Form, or EAF) and Phase 1A Archaeological Assessment on behalf of the State University Construction Fund (SUCF) for a 5.5-acre site proposed for new academic building in the Village of Johnson City, Broome County, NY.

Maxwell Field Streambank Stabilization Project – Principal-in-Charge and Project Manager for Phase 1 Archaeological Survey for 0.3-acre streambank stabilization project in the City of Oneida, Madison County, NY.

Chain Works District Redevelopment Project – Principal-in-Charge for preparation of Phase 1A Archaeological Survey in support of SEQRA review of 95-acre historic industrial site proposed for redevelopment in the City of Ithaca, Tompkins County, NY.

Central Hudson Gas & Electric W-H and G Transmission Lines – Technical Director for SHPO consultation, archaeological surveys, and visual impact studies in support of NYS Public Service Commission Part 102 Applications for the refurbishment of a 13-mile transmission-line in Ulster County and an 11-mile transmission line Dutchess County, NY.

Coye Hill Wind Farm – Project Manager for Natural Resources Impact Evaluation Report and consultation with the Connecticut SHPO in support of Petition for a Declaratory Ruling from the Connecticut Siting Council for proposed 4-turbine, 12 MW wind energy project in Tolland County, CT.

NFG Dunkirk Pipeline – Principal-in-Charge and Project Manager for SHPO consultation and Phase 1A/1B Archaeological Surveys in support of NYS Public Service Commission Article VII Application for a proposed 9-mile natural gas pipeline located in Chautauqua County, NY.

Rochester Genesee Regional Transit Authority (RGRTA) Orleans County Transit Facility – Project Manager for preparation of Phase 1A Archaeological Survey in support of NEPA review of proposed 2-acre bus storage/service facility in Orleans County, NY.

Great Bay Wind Project – Project Manager for preparation of cultural resources surveys, consultation with the Maryland Historical Trust (MHT), and Visual Impact Assessment for a proposed 35-turbine, 100 MW wind energy project in Somerset County, MD. Services provided in support of Maryland Public Service Commission review for a CPCN and Section 106 consultation as part of NEPA review by the U.S. Fish and Wildlife Service in association with Bald and Golden Eagle Protection Act take permit review.

Onondaga Lake West Revitalization Area – Project Manager for preparation of Phase 1 cultural resources surveys of 400-acre brownfield area and proposed streetscape improvements in the Village of Solvay, Onondaga County, NY.

Van Dyke Road Substation – Technical Director for Visual Impact Assessment and Phase 1 archaeological survey for a proposed 4.3-acre substation site and 1.6-mile underground transmission duct bank located in Albany County, NY.

Batavia Senior Housing Project – Project Manager for Phase 1 Archaeological Survey and prepared Phase 2 Archaeological Site Investigation Work Plan for a 13.5-acre site proposed for development as a senior housing facility in Genesee County, NY.

Copenhagen Wind Project – Technical Director for preparation of Phase 1A/1B Archaeological Survey and Historic Resources Survey, New York SHPO consultation, Visual Impact Assessment, and prepared sections of Draft Environmental Impact Statement (DEIS) and FEIS as part of SEQRA review for proposed 47-turbine, approximately 79 MW wind energy project in Lewis County, NY.

Black Oak Wind Farm – Technical Director for Phase 1A Cultural Resources Survey, Historic Resources Visual Effects Analysis, and SHPO consultation in support of SEQRA review for a proposed 7-wind turbine, 14-MW wind energy project in Tompkins County, NY.

Downtown Syracuse Commercial Historic District – Project Manager for preparation of National Register of Historic Places (NRHP) nomination and Multiple Property Documentation Form on behalf of the Downtown Committee of Syracuse, Inc. for a proposed 21-acre historic district located in the City of Syracuse, Onondaga County, NY. The nomination was approved by the National Park Service and listed on the NRHP on May 7, 2013.

Chittenango Landing Dry Dock Complex Cultural Landscape Report – Project Manager for preparation of Part 1 of a Cultural Landscape Report (CLR) on behalf of the Chittenango Landing Canal Boat Museum for a 6-acre historic site/museum listed on the NRHP. The interpretive site includes a 19th-century dry dock complex and associated buildings located on the Erie Canal in the Town of Sullivan, Madison County, NY.

Aquidneck Island Reliability Project – Technical Director for visual fieldwork, visual simulations, and report preparation for a Visual Impact Assessment (VIA) for the proposed upgrade of approximately 4.4 miles of National Grid 69 kV transmission line to 115 kV in Newport, RI.

Mary Cariola Children's Center – Project Manager for a Phase 1 Archaeological Survey conducted as part of SEQRA review for a proposed residential facility for disabled children located on 1.3 acres in the Town of Henrietta, Monroe County, NY.

Central Hudson Gas & Electric A and C Transmission Lines – Technical Director for SHPO consultation, Phase 1 Archaeological Survey, and Visual Impact Assessment in support of Article VII application for the rebuild of 11 miles of 115 kV transmission lines in Dutchess County, New York.

Indian Point Energy Center (IPEC) – On behalf of Scenic Hudson, Inc., and Riverkeeper, coordinated preparation of visual simulations and Visual Impact Assessment for a proposed closed-cycle cooling (CCC) system at a nuclear energy facility located in Westchester County, NY.

Scioto Ridge Wind Farm – Prepared Cultural Resources Survey Work Plans in support of Ohio Power Siting Board (OPSB) Certificate Application for proposed wind energy project with up to 176 wind turbines and a generating capacity of up to 300 MW in Hardin and Logan Counties, OH.

University at Buffalo School of Medical and Biological Sciences – Project Manager for SEQRA process on behalf of the State University Construction Fund, including preparation of DEIS and support studies (Visual Assessment, Archaeological Sensitivity Assessment, and Historic Resources Impact Assessment), conducted SEQRA public hearing, preparation of FEIS, and SEQRA Findings Statement for a proposed ~600,000 gross square foot medical/educational facility located on the University at Buffalo's Downtown Campus in the City of Buffalo, Erie County, NY.

Wild Meadows Wind Project – Technical Director for visual fieldwork/photography and presented visual resources analyses and simulations at public open houses conducted in support of Section 106 of the National Historic Preservation Act (NHPA) consultation for a proposed 37-turbine, 74 MW wind energy project in Grafton and Merrimack Counties, NH.

Loveless Farms – Technical Director for Phase 1 Archaeological Survey and Visual Impact Assessment in support of SEQRA review for a proposed 18-lot subdivision located on 47 acres in the Town of Skaneateles in Onondaga County, NY.

White Pine Commerce Park – Project Manager for Phase 1 Archaeological Survey and SHPO consultation for Onondaga County Industrial Development Authority (OCIDA) in support of SEQRA review for a 300-acre parcel and 4-mile sewer line in the Town of Clay, Onondaga County, NY.

Empire Brewing Company Farmstead Brewery – Project Manager for visual assessment, viewshed analyses, visual simulations, and analysis of visual effects on NRHP-listed properties as part of SEQRA review for a proposed craft brewery in the Town of Cazenovia, Madison County, NY.

Wilcox Estates – Project Manager for a Phase 1 Archaeological Survey as part of SEQRA review for a proposed 32-lot subdivision located on 20 acres in the Town of Barton in Tioga County, NY.

Barcelona Water Improvement District – Project Manager and Technical Director for a Phase 1 Archaeological Survey as part of Section 106 of the NHPA review for a 4-mile long public water system located in the hamlet of Barcelona, on behalf of the Town of Westfield in Chautauqua County, NY.

Village of Danforth Historic Resources Survey – Project Manager for development of public outreach strategy, historic resource inventory forms, and visual field guide to enable community volunteers to conduct a Neighborhood Historic Resource Survey and NRHP eligibility evaluation of over 300 buildings for the City of Syracuse Bureau of Planning and Sustainability in Syracuse, Onondaga County, NY.

SUNY Cortland Student Life Center – Project Manager for SEQRA process on behalf of the State University Construction Fund, including preparation of DEIS, support studies (including, Visual Impact Assessment, Phase 1A Cultural Resources Survey, and Phase 1 Environmental Site Assessment), FEIS and SEQRA Findings Statement for proposed recreational athletic facility in the City of Cortland, Cortland County, NY.

Newfield Covered Bridge – Project Manager for preparation of a Phase 1A Cultural Resources Survey for a NRHP-listed historic bridge rehabilitation (NYSDOT PIN 37550) in the Town of Newfield, Tompkins County, NY.

Owasco River Greenway Trail – Technical Director for Phase 1A Cultural Resources Survey for a proposed 8.4-mile-multi-modal recreational trail (NYSDOT Project 375557) in the City of Auburn and Town of Fleming, Cayuga County, NY.

Niagara Falls Underground Railroad Heritage Area Management Plan – Cultural resources specialist for preparation of a Heritage Area Management Plan (HAMP) authorized under Section 35.05 of the New York State Parks, Recreation, and Historic Preservation Law to identify and encourage heritage tourism opportunities related to the Underground Railroad in the Niagara Falls vicinity, Niagara County, NY.

Seneca Park Zoo Parking Lot Expansion – Project Manager for a Phase 1 Archaeological Survey in support of SEQRA review on behalf of Monroe County Parks Department for a 1.5-acre parcel in the City of Rochester and Town of Irondequoit, Monroe County, NY.

Crown City Wind Project – Technical Director for Cultural Resources Survey, Visual Impact Assessment, and prepared DEIS sections as part of SEQRA review for proposed 44-turbine, approximately 71 MW wind energy project in Cortland County, NY.

Buckeye II Wind Project – Technical Director for Visual Impact Assessment for a proposed 56-turbine, 140 MW wind energy project in Champaign County, OH in support of an Application for a Certificate of Environmental Compatibility and Public Need to the Ohio Power Siting Board (OPSB).

Monticello Hills Wind Project – Project Manager for SEQRA process and preparation of permitting support studies (including Full Environmental Assessment Form, Visual Impact Assessment, wetland delineation, shadow-flicker analysis, Phase 1A Cultural Resources Survey, Historic Resources Survey, and Phase 1B Archaeological Survey) for a proposed six-turbine, 18 MW wind energy project in Otsego County, NY.

South Mountain Wind Project – Project Manager for preparation of environmental permitting studies in support of SEQRA review (including wetland delineation, threatened and endangered species habitat assessment, and timber rattlesnake survey) for a proposed community-scale wind energy project in Delaware County, NY.

Smokey Avenue Wind Project – Project Manager for preparation of environmental permitting studies in support of SEQRA review (including Shadow Flicker Analysis, ballooning fieldwork and visibility study, and Phase 1A Cultural Resources Survey) for proposed community-scale wind energy project in Otsego County, NY.

Roaring Brook Wind Power Project – Technical Director for supplemental/addendum Phase 1B Archaeological Survey in association with project layout revisions for a proposed 79MW wind energy project located in Lewis County, NY.

Sackets Harbor Battlefield National Historic Landmark (NHL) Nomination – Prepared sections of NHL nomination and Battlefield Preservation Plan for the 260-acre War of 1812 battlefield in Sackets Harbor, Jefferson County, NY, under a grant from the American Battlefield Protection Program of the National Park Service.

Warren Hull Family Home and Farmstead – Coordinated preparation of graphic displays for cultural landscape historic overview and treatment plan to support restoration of the landscape at a ca. 1825 landmark house museum in Erie County, NY.

Long Island - New York City Offshore Wind Project – Project Manager for preparation of visual simulations, web-based presentation, and associated visualization services for a proposed 350 MW offshore wind energy project located in the Atlantic Ocean approximately 13 miles off the coast of Queens, Nassau, and Suffolk Counties, NY.

Allegany Wind Power Project – Technical Director for supplemental/addendum Phase 1B Archaeological Survey in association with review of construction plans by New York SHPO for a proposed 29-turbine, 72.5 MW wind energy project located in Cattaraugus County, NY.

Horse Creek Wind Farm – Technical Director for a Visual Impact Assessment, including viewshed analysis, field work, photographic simulations, and VIA report for a proposed 50-turbine, 100 MW wind energy project in Jefferson County, NY.

Tioga Downs Wastewater Improvement Project – Project Manager for a Phase 1 Archaeological Survey and Phase 2 Archaeological Site Investigation of a pre-contact Native American archaeological site for a wastewater treatment facility and 0.5-mile water line in Tioga County, NY.

Collegetown Terrace – Served as Lead Agency's consultant for SEQRA review and prepared FEIS on behalf of the City of Ithaca Planning & Development Board for a 16-acre, 1,260-unit student housing project in Tompkins County, NY.

Big Savage 138 kV Generator Lead – Technical Director for Visual Impact Assessment and Cultural Resources Assessment for Maryland Public Service Commission CPCN review of a proposed 7-mile transmission line in Allegany County, MD.

Marble River Wind Project – Technical Director for cultural resources and visual impacts analyses for SEQRA permitting review of a revised layout for a 74-wind turbine, 222 MW wind energy project located in Clinton County, NY.

Amherst State Park Veterans Memorial – Project Manager for a Phase 1B Archaeological Survey for a proposed veterans' memorial and 1,500-foot footpath in Amherst State Park, Erie County, NY.

Timber Road II Wind Project – Technical Director for a Visual Impact Assessment for a 109-turbine, 150 MW wind energy project in Paulding County, OH in support of an Application for a Certificate of Environmental Compatibility and Public Need submitted to the Ohio Power Siting Board (OPSB.

Hardscrabble Wind Power Project – Technical Director for supplemental Phase 1B Archaeological Survey, construction monitoring, and compliance with U.S. Army Corps of Engineers/SHPO Memorandum of Agreement for a 37-turbine, 74 MW wind energy project in Herkimer County, NY.

Benson Mines Meteorological Tower – Technical Director for visual assessment, ballooning fieldwork, and visual simulations in accordance with the Adirondack Park Agency (APA) Visual Analysis Methodology for a proposed 160-foot meteorological tower in St. Lawrence County, NY.

Deerfield Wind Power Project – Prepared sections of Supplemental DEIS for a 15-turbine, 30 MW wind energy project located in the Green Mountain National Forest, Bennington County, VT as part of NEPA review on behalf of the U.S. Department of Agriculture (USDA) National Forest Service.

National Grid 115 kV Line, Lighthouse Hill to Coffeen Street – Prepared visual impact assessment portion of Part 102 Report for a 40-mile 115 kV transmission line maintenance and refurbishment project in Oswego and Jefferson Counties, NY.

National Grid Eastover Road Substation and Tap Line – Ballooning/visual impact assessment fieldwork for a proposed 6.4-acre 230/115 kV substation and 0.75-mile 155 kV tap line located in the Town of Schagticoke, Rensselaer County, NY.

STATE OF NEW YORK
PUBLIC SERVICE COMMISSION

Application of Galloo Island Wind Transmission Facility for a Certificate under Article VII of the Public Service Law

Case No. 18-T-0015

PRE-FILED TESTIMONY OF:

PETRO W. KAZANIWSKY, P.E.

CHIEF GEOTECHNICAL ENGINEER

TRC COMPANIES, INC.

Q: Please state your name, employer, and business address.

A: Petro W. Kazaniwsky, P.E., TRC Companies, Inc. (TRC), 16000 Commerce Parkway, Suite B, Mount Laurel, NJ 08054.

Q: What is your position at TRC?

A: I am a Chief Geotechnical Engineer.

Q: How long have you been employed with TRC?

A: I have been employed with TRC since 1977.

Q: Please describe your educational background and professional experience.

A: I earned Bachelor and Master of Science degrees in Civil Engineering from Drexel University. I am a licensed professional engineer in New York, Pennsylvania, Virginia, Delaware, Maryland, Louisiana, North Carolina, New Jersey, Maine, South Carolina and West Virginia. I have over 40 years of experience in geotechnical engineering and field quality control on a wide variety of residential, commercial and industrial projects, including power generation facilities and electrical transmission. This experience includes subsurface investigations, geotechnical interpretation and analysis of subsurface data, deep and shallow foundation analysis, slope stability analysis and other related subjects. See the attached curriculum vitae for details.

Q: Please describe your current responsibilities with TRC.

A: I am responsible for all phases of a project, including client contact, proposal preparation, coordination and management of all phases of the project, supervision of personnel, engineering analyses, preparation of reports and specifications and consultation during construction.

Q: **Have you previously testified before the New York State Public Service Commission or Siting Board on Electric Generation?**

A: Yes. I previously testified in conjunction with an application for a cogeneration facility proposed to be constructed in Brooklyn, NY.

Q: Have you previously served as an expert witness before any other court, agency, or other body on the subject you plan to offer testimony on today?

A: Yes. I have provided expert witness reports and testimony related to geotechnical engineering issues in various litigation cases, some of which are identified in the attached curriculum vitae. I have also provided testimony before local municipal boards on behalf of developers.

Q: What is the purpose and scope of your testimony in this proceeding?

A: To sponsor certain portions of the Galloo Island Wind Transmission Facility Application or the Exhibits thereto.

Q: What portion(s) of the Application is your testimony sponsoring?

A: Exhibit 4.5.

Q: Were these Exhibits, Application sections, or studies prepared by you or under your direction and supervision?

A: Yes.

Q: In your testimony, will you refer to, or otherwise rely upon, any studies, publications, data or documents produced by persons other than yourself/your company? If so, please cite these sources. [These are independent studies, etc.]

A: Yes, appendices referenced in the section of the Application that I am sponsoring as set forth above.

Q: Does this conclude your testimony?

A: Yes.

TRC

PETRO W. KAZANIWSKY, PE

EDUCATION

M.S., Civil Engineering, Drexel University, 1981
B.S., Civil Engineering, Drexel University, 1977

PROFESSIONAL REGISTRATIONS/CERTIFICATIONS

Professional Engineer, New York (#081310-0), 2003
Professional Engineer, Pennsylvania (#PE-031597E), 1982
Professional Engineer, Virginia (#0402-022160), 1991
Professional Engineer, Delaware (#8666), 1991
Professional Engineer, Maryland (#18238), 1990
Professional Engineer, Louisiana (#31880), 2005
Professional Engineer, North Carolina (#017204), 1991
Professional Engineer, New Jersey (#24GE02919900), 1983
Professional Engineer, Maine (#7237), 1984
Professional Engineer, South Carolina (#19751), 1999
Professional Engineer, West Virginia (#014547), 2000

AREAS OF EXPERTISE

Mr. Petro W. Kazaniwsky, PE has project management and technical experience in the following general areas:

- Development of Subsurface Investigations
- Geotechnical Interpretation and Analyses of Subsurface Data
- Deep and Shallow Foundation Analyses and Recommendations
- Ground Improvement
- Slope Stability Analyses
- Slope Stabilization
- Stabilization of Foundation Settlement
- Foundation and Earthwork Construction Quality Control
- Pavement Design
- Litigation Support
- Expert Testimony
- Development of Geo-instrumentation Programs

REPRESENTATIVE EXPERIENCE

Mr. Kazaniwsky possesses over 40 years of experience in geotechnical engineering and field quality control for such projects as low to high-rise residential developments, industrial processing facilities, power generation facilities, electrical transmission, hospitals, ilow to high-rise office complexes, regional shopping centers, multi-story parking facilities, highways, bridges, schools and churches. Primary responsibilities include all phases of a project including client contact, proposal preparation, coordination and management of all phases of the project, supervision of personnel, engineering analyses, preparation of reports and specifications, and consultation during construction. Specialized experience includes site stabilization, modeling and in-situ testing of pile and drilled pier foundations, design and installation of geotechnical

instrumentation monitoring systems, and pavement design. He has provided third-party reviews for construction claims resolution, as well as expert witness testimony in connection with geotechnical-related claims. He also currently serves at the Quality Assurance Manager for the firms geotechnical engineering and drilling practices and is responsible for peer reviews of all technical aspects of the practice. He has been with the firm since 1977 and has been involved in over 2,600 geotechnical projects.

Champlain Hudson Power Express- Canada to New York City High DC Voltage Transmission Line (Chief Geotechnical Engineer/Senior Project Manager: 2012-2013)

The project consists of the installation of a buried high voltage DC power line delivering energy from Canada to New York City, traveling through entire length of Lake Champlain, highways, along railroad right-of-ways, and then eventually through the Hudson River. TRC was responsible for the terrestrial portion of the project which begins in Dresden, NY where the route runs in a southerly direction along NY Route 22, transitions to the Canadian (CP) Pacific railroad right-of-way, then the route follows the CSX Transportation (CSX) railroad right of-way terminating in Catskill, NY. The entire length of the terrestrial portion of the project entailed a trenched buried cable with a large number of horizontal direction drilling (HDD), as well as jack and bore (JB) locations. The entire terrestrial route length was approximately 125 miles and a total of 209 test borings were drilled for the project. Mr. Kazaniwsky acted as the senior project manager and was responsible for developing all the geotechnical requirements for the project and coordinating the geotechnical field investigation program (test borings and field thermal and electrical resistivity testing), as well as the laboratory testing program (geotechnical testing of soil and rock and thermal resistivity testing). Responsibilities included coordinating all the work with the client and the client's construction manager/constructor. At the completion of the field and laboratory program for each relevant terrestrial section of the project, a geotechnical data report was prepared under Mr. Kazaniwsky's technical oversight. A total of three comprehensive geotechnical data reports were prepared and submitted on a timely basis to meet the client's schedule.

86 Bayside Drive (Pepe Property) – Borough of Atlantic Highlands, NJ (Geotechnical Consultant: 2014)

Currently Mr. Kazaniwsky is providing geotechnical consultation services for this on-going project. To date he reviewed the construction documents associated with the slope remediation construction at the property located at 86 Bayside Drive in the Borough of Atlantic Highlands. The purpose of this review was to establish the potential adverse impact of the proposed construction at this property on the existing Henry Hudson Trail. Any requirements for protection or restoration of the trail property were also identified. A brief letter report was prepared subsequent to the review and a site visit. Mr. Kazaniwsky continues reviewing the construction photos and updated drawings and additional site visits are planned.

ASC-64 Locomotive Commissioning Facility AMTRAK Maintenance Facility-Wilmington, DE (Chief Geotechnical Engineer: 2013)
Mr. Kazaniwsky directed a geotechnical investigation that included test borings and laboratory testing for the proposed construction consisting of a new locomotive commissioning facility at AMTRAK's Wilmington, DE maintenance facility. The project consists of a new truss-supported roof structure approximately 100 ft wide and 200 ft long with a peak roofline extending approximately almost 40 ft above the adjacent exterior grade. The facility will include new locomotive platforms and maintenance pits connecting to two existing tracks, office space located on a raised platform, and associated ramps and slabs. Due to presence of deep uncontrolled fills and soft compressible soils all structure and equipment support was to consist of deep foundations such as auger-cast, driven timber, or concreted pipe pile alternatives.

Stormwater Management Upgrades at Westchester County Airport – Westchester County, NY (Geotechnical Engineer: 2013)
Led a geotechnical investigation associated with the expansion of existing storm water basins A and B, as well as the installation of a new water quality improvement area. Directed the completion of a test boring (26) program, laboratory testing program and infiltration tests in the field in general accordance with the New York State Stormwater Management Design Manual. Also performed a global stability analyses to assess the feasibility and/or potential concerns related to construction of the proposed berms in Basins A and B. Based on the results of such investigative measures, he provided recommendations associated with earthwork and groundwater impacts.

New York City Department of Parks and Recreation, Ferry Point Park Golf Course, Borough of The Bronx, NYC (Lead Geotechnical Engineer: 2008 – 2009)
Mr. Kazaniwsky assumed the role of Lead Geotechnical Engineer during the development and design of a tournament quality 18-hole golf course over an existing municipal waste landfill. Responsibilities included his development and implementation of a geotechnical investigation program which consisted of nearly 70 test borings to establish municipal waste depths, as well as the thickness of compressible river silts. Laboratory testing was completed on the compressible silts to evaluate their performance under load of new fills required to attain final grades. After the evaluation of anticipated settlements under imposed fill load, recommendations were then developed to mitigate the settlements for the critical golf course components such as greens and tees, irrigation basin and utility corridors. Solutions included Deep Dynamic Compaction and surcharging. Furthermore, geogrids were incorporated under the greens and tees, as well as the irrigation basin and parking/driveway areas, to limit localized subsidence. Structures such as the comfort station and rain shelters were to be founded on shallow mat foundations in connection with deep dynamic compaction and use of cellular concrete to create a "net zero load" condition.

Consolidated Edison, Corona Substation Circuit Breaker Upgrades - Queens, New York (Lead Geotechnical Engineer: 2008 - 2009)
Located just northwest of the intersection of 98th Street with 55th Avenue, the project involved the installation of new and replacement circuit breakers. According to historic test borings performed in 1975 at the project site during initial construction of the substation, the site is underlain by uncontrolled fill materials extending to 20 to 30 ft below the ground surface. Underlying the fill material the test borings encountered natural soils consisting of alternating layers of sand with varying quantities of silt and clay, and silt/clayey silt. Utilizing this information, Mr. Kazaniwsky characterized the engineering properties of the subsoils at the specific location of proposed construction, and developed foundation solutions to support the new electrical equipment on micro-piles or alternatively helical screwed-in anchor piles, including the preparation of associated foundation specifications.

Market Street Elevated Reconstruction-Stations & Cobbs Creek Contracts, Philadelphia, PA (Chief Geotechnical Engineer 2004-2007)
Responsibility included client contact and technical oversight and direction of TRC's Foundation Quality Control Engineer during the reconstruction of SEPTA's Market Street Elevated rail system between 46th Street and Millbourne Station. Project requirements included monitoring the installation of drilled shaft and mat foundations for the new platforms and stations, as well as the soldier pile-based support of excavation systems. Additionally reviewed the Osterberg Cell load testing program, soil placement and compaction, and material testing operations. Project also included field oversight by the Foundation Quality Control Engineer during a 3000 lineal foot test boring program which included over 1600 lineal feet of rock coring.

NJ Department of Transportation, Route 47 Bridge Over Grassy Sound - Cape May County, NJ (Chief Geotechnical Engineer: 1997-2000)
Mr. Kazaniwsky was responsible for managing all aspects of a geotechnical study to investigate two bridge piers that were tilting, including determining the probable cause and providing recommendations to halt or mitigate additional tilting. The bridge structure itself consists of seven bridge spans, six piers, and two abutments supported on timber piles. A compaction grouting program was designed to stabilize the subsoils.

Masonic Temple Settlements and Stabilization - Philadelphia, PA (Geotechnical Consultant: 1995)
Mr. Kazaniwsky provided consultation to the owner with regard to settlements that were allegedly caused by the construction of deep foundations for a new detention center adjacent to the historic Masonic Temple. He directed a very comprehensive subsurface investigation to establish the mechanism of the settlements and to provide sufficient subsurface information for stabilization of the existing masonry foundations. The study showed that the structure is underlain by a layer of very sensitive soil subject to liquefaction and the study verified that the observed settlements in fact were caused by the construction

related vibrations. A stabilization program consisting of compaction grouting was designed and implemented to stabilize the problematic soils. Monitoring of the structure was performed during the stabilization program to minimize heave-associated problems. The information obtained by this study was then used to settle the outstanding claim on behalf of the Masonic Temple.

Riverfront State Medium Security Prison - Camden, NJ (Geotechnical Engineer: 1981-1984)
Mr. Kazaniwsky assumed the role of Geotechnical Engineer during the completion of a subsurface investigation for this new medium security prison that was constructed on a 35-acre parcel of land adjacent to the Delaware River. The project included multiple 3-story cast-in-place concrete structures for inmate housing, a visitors building, a dining facility, and three (3) guard towers. The resulting foundation system employed concrete-filled pipe piles, while a methane gas abatement system was incorporated into the project due to the discovered presence of such gas. A load testing program was developed to minimize production pile lengths, while a program to stabilize old remnant piers was also implemented.

Slope Failure Below Residential Structure Claim - Bethel Park, PA (Geotechnical Consultant: 2002)
Claim involved a down-slope failure impacting an upslope property and residence. Mr. Kazaniwsky represented the owner who experienced significant instability of an approximately 50 ft high slope, which caused excessive vertical and horizontal movements and cracking of an in-ground swimming pool. This slope was reportedly rebuilt and stabilized by the developer in accordance with a designed remediation approach prior to development of this property. A comprehensive study was performed to establish the subsurface conditions and overall condition of the slope and likely mechanism of failure. The study established that the remediation approach was not implemented as per the original stabilization design, and the ongoing slope failure can be attributed to poor construction procedures and lack of the stabilization implementation.

Valley Creek Coalition v. Commonwealth of Pennsylvania DEP and Vanguard Group (Geotechnical Consultant: 2005)
Vanguard Group developed an 80 acre site in Whiteland Twp., PA as part of their corporate office complex. The project site is located in karst terrain subject to sinkhole development. Various environmentalist groups represented by the Valley Creek Coalition felt that the currently designed storm water management systems (SWMS) were insufficient and brought suit against the PADEP and Vanguard Group to expand the SWMS to include on-site recharge systems. Mr. Kazaniwsky prepared expert reports and testimony on behalf of the Vanguard Group that identified, from a geotechnical perspective, the potential for future problems and difficulties associated with implementing such an on-site recharge system at this project site. The courts ruled on behalf of the Vanguard Group.

Residential Development Roadway Pavement Distress Claim - Wall Township, NJ (Geotechnical Consultant: 2005)
At the request of the owner's association, Mr. Kazaniwsky directed a detailed investigation to establish the causes of pavement blistering and disintegration throughout the relatively large development. Localized removal of the pavement and subgrade materials was performed to expose the pavement components and extensive laboratory testing was conducted to establish conformity of pavement construction materials to accepted standards, and find the cause of the pavement blistering. The study established that the cause of the pavement blistering was due to the presence of reactive product within the subbase material having highly expansive properties and subsequently causing pavement heave and the observed localized blistering. Furthermore, the laboratory testing showed that the subbase materials and pavement sections were deficient. An expert report was prepared.

Pocahontas Parkway - Chesterfield and Henrico Counties, VA (Chief Geotechnical Engineer: 1995-2001)
Mr. Kazaniwsky assumed the role of Chief Geotechnical Engineer for this major, $325 million Design-Build project that involved the design of a 3.9 mile long section of new, 4-lane limited-access interstate highway with toll facilities. Included a major crossing of the James River (segmental concrete), new ramp (4) and mainline (6) bridges, bridge widenings (2), a bridge replacement over the CSX railroad, toll facilities, a new four-level interchange with I-95, and a trumpet type interchange with Laburnum Ave. Mr. Kazaniwsky was responsible for the completion of a geotechnical investigation for a new bridge over the James River and nine (9) new ramps that tied the bridge into I-95. Responsibilities included: preparation, implementation, and supervision of subsurface investigations and laboratory testing programs for over 300 test borings; foundation design for each ramp and bridge substructure unit (H-piles, pipe piles, drilled shafts, and spread footings); design of gravity, Mechanically-Stabilized Earth (MSE), and ground anchor-supported retaining walls; large-scale earthwork operations (high embankments, steep reinforced slopes, geosynthetic stabilization, and undercut of soft roadbed soils); load testing of drilled pier and pile foundations; preparation of specifications; value engineering, and construction consultation. A pavement analysis was performed and recommendations made for the toll plaza portion of the project. A geotechnical instrumentation system consisting of vibrating wire piezometers and settlement platforms was designed and installed as part of the project.

R.E. Michael Co. Building Floor Slab Settlement Claim - Wilmington, DE (Geotechnical Consultant: 1997)
Mr. Kazaniwsky provided consultation to the owner regarding large settlements that were being experienced by a building that was constructed along the Christiana River. At the request of counsel representing the building owner, a subsurface investigation was implemented to determine the causes of the settlements and potential remediation methods. The study established that the building site is underlain by very soft highly compressible organic soils that settled under the weight of fill required to raise the grades, as well as the live

floor loads. The building frame was supported on deep foundations. An expert report was prepared concluding the mechanism of settlements and finding that the original geotechnical engineer neglected to consider the impact of the required grading in the decision not to support the floor slab on piles. Expert testimony was then provided on behalf of the building owner.

Transgas Energy Systems 1,100 Megawatt Combined Cycle Cogeneration Facility - Borough of Brooklyn, NY (Chief Geotechnical Engineer: 2003-2005)
Mr. Kazaniwsky assumed the role of Chief Geotechnical Engineer during the completion of a preliminary geotechnical investigation at the planned location of a cogeneration facility that was proposed for construction within an existing fuel storage facility on the East River. The purpose of this investigation was to characterize the subsurface conditions and evaluate alternative foundation systems for support of the proposed facility. A preliminary geotechnical report was prepared which included recommendations for alternative deep pile foundations. In conjunction with Transgas Energy Systems' public need and environmental compliance application to the New York Public Service Commission, a written rejoinder testimony was prepared and expert witness testimony was provided during the Public Service Commission hearings.

Alfred Pierce Generating Station Upgrades - Wallingford CT (Sr. Geotechnical Engineer)
Mr. Kazaniwsky was a Sr. Geotechnical Engineer responsible for compiling the geotechnical report associated with upgrades to this existing power plant. Major new structures included a new turbine generator, electrical transformers, oil and water tanks, a new stack, roadways, above and below grade utilities, and many other small ancillary buildings/structures. The report included an evaluation of subsurface conditions, evaluation and recommendation of feasible foundation alternatives for heavy, highly sensitive structures and smaller lightly loaded structures, recommendations for re-use of onsite soils in structural fills and recommendations for maintaining the stability of temporary excavations. Pavement design was also prepared for this facility.

Dynegy Combined-Cycle Power Station, Frederick, MD (Chief Geotechnical Engineer: 2001-2002) – Mr. Kazaniwsky provided technical oversight during the planning and execution of all aspects of a comprehensive geotechnical evaluation for this new combined cycle power plant covering approximately 35 acres of a 115 acre property. The proposed construction consists of a combined cycle electric power generating station. Major structures associated with this facility include 4 gas turbine generators, numerous transformers, condensing units, roadways, water tanks, fuel oil storage tanks, storm water detention basins, and many small ancillary buildings. The site is underlain by solution-prone limestone conglomerate. During the geotechnical investigation, a parallel hydrogeologic study being completed by others in which a groundwater pump test was being conducted caused the occurrence of a 50 ft wide and 30 ft deep sinkhole. Mr. Kazaniwsky reviewed the recommendations for repair of this

sinkhole and the results of a detailed reconnaissance of the site and surrounding area to evaluate the potential for future sinkhole activity. Recommendations for foundations and earthwork activities were developed to account for the potential for subsidence under Mr. Kazaniwsky's oversight.

Brookhaven Energy Facility- Long Island, NY (Chief Geotechnical Engineer: 2004 – 2006)
Mr. Kazaniwsky was responsible for planning and directing all aspects of a comprehensive geotechnical evaluation for this new combined cycle power plant covering approximately 20 acres. Major structures include cooling towers, combustion turbine generators, steam turbine generators, heat recovery steam generators, electrical transformers, oil and water tanks, stacks, roadways, above and below grade utilities, and many other small ancillary buildings/structures. Work also included resistivity survey arrays. Mr. Kazaniwsky also planned and oversaw a seismic cross-hole survey at this site with a team subcontractor that was conducted to provide typical shear and compression-wave velocities (Vs and Vp). Pavement recommendations were provided.

Puddledock Substation, Manchester, ME (Chief Geotechnical Engineer: 2012)
Mr. Kazaniwsky was responsible for a peer review of a geotechnical report prepared for a substation upgrade consisting of new transformers, a new control building and dead end structures. Subsurface conditions consisted of clayey glacial marine deposits underlying by dense glacial till. Groundwater was at shallow depths, which provided a challenge for the anticipated site work. Shallow foundations founded in the stiff natural soils were recommended in conjunction with dewatering.

Paulsboro Marine Terminal, Paulsboro, NJ (Chief Geotechnical Engineer: 2008 – 2009)
Mr. Kazaniwsky was responsible for planning and directing all aspects of a comprehensive geotechnical investigation and evaluation for this new 167 acre marine terminal located on the Delaware River. Major structures include a 2,350 ft long ship berth to accommodate up to three "Handy-Max" 650 LOA bulk carrier ships , a 44 acre forest products storage area and five transit buildings, a 52 acre metal scrap storage and steel shredder facility, 16 acres of wheeled cargo storage, as well as numerous terminal roads and terminal railways. Mr. Kazaniwsky also planned and oversaw environmental sampling and testing of river sediments for proposed dredging. Deep foundation systems, consisting of concrete or concrete filled pipe piles were evaluated for the berth system.

Science Center Buildings at 3711 and 3737 Market Street- Philadelphia, PA (Chief Geotechnical Engineer: 2006 – 2010)
Mr. Kazaniwsky served as the senior project manager for these two multi story structures. His responsibilities included technical oversight for the geotechnical studies and geotechnical engineering analyses for these two projects. He provided geotechnical consultation during drilled pier foundation construction at

3711 Market Street. He also provided geotechnical engineering consultation during conceptual plan development at 3737 Market Street which included foundation constructability review and ground water management during construction and permanent, as well as storm water recharge. Additionally, alternative drilled pier foundation inspection methods were considered and their impact on design and construction evaluated. A formal geotechnical report was prepared for both projects.

Chesterfield County Dept. of Public Works, Old Buckingham Road Realignment - Chesterfield County, VA (Chief Geotechnical Engineer: 2001)
Mr. Kazaniwsky provided technical oversight for this roadway rehabilitation project which included the preparation of a Geotechnical Engineering Report for the substructure of a proposed new bridge in accordance with AASHTO Load Factor Design (LFD) specifications. Mr. Kazaniwsky performed the roadway pavement design.

Drexel University- North Hall, 33rd and Race Streets, Philadelphia, PA (Chief Geotechnical Engineer: 1997 – 1999)
Directed the completion of a geotechnical investigation and associated consultation for the design and construction of an 8-story residence hall on the campus of Drexel University. Project included the completion of a cost-based feasibility study for foundation selection (drilled piers versus auger-cast piles), monitoring and analysis of auger-cast pile load tests, and the direction of field inspection personnel during construction.

Drexel University- East Hall (former AMTRAK property), 32rd Streets, Philadelphia, PA (Chief Geotechnical Engineer: 1999 – 2000)
Directed the completion of a geotechnical investigation and associated consultation for the design and construction of the new residence hall on the campus of Drexel University. Project included the completion of a cost-based feasibility study for foundation selection (drilled piers versus auger-cast piles) with the auger-cast found to be more cost effective. Providing monitoring and analysis of auger-cast pile load tests during construction.

Laurel Creek Office Buildings - Burlington County, NJ (Chief Geotechnical Engineer: 2002)
Mr. Kazaniwsky provided technical oversight during the geotechnical study performed for this proposed corporate complex that consists of three (3) three-story steel frame office buildings and related infrastructure. Oversaw the preparation of the Geotechnical Engineering Report which included an evaluation and recommendation of foundation support for structures and floor slabs, groundwater conditions and management, soil material and compaction requirements for the support and backfill of structures, reusability of on-site soils in compacted fill, and frost penetration depth. Mr. Kazaniwsky prepared a pavement design for this project.

Franklin Mills Mall, Philadelphia, PA (Geotechnical Project Manager: 1986) –Mr. Kazaniwsky was responsible for managing all of the required geotechnical engineering work for this 2,000,000 sq ft regional mall, as well as all out-parcels. Portions of the site were underlain by extensive fill materials with a thickness of up to 30 feet, which would experience significant amounts of settlement under applied load. To remedy this, and minimize the potential for differential settlement across the project area, deep dynamic compaction in conjunction with a limited soil exchange was employed at the site. The use of dynamic compaction offered a less time consuming alternative to preloading and allowed for the use of shallow spread footing foundations rather than deep foundation systems and/or extensive soil removal and replacement, which were deemed to be more costly alternatives. Extensive pavement design was also required to offer economical pavement alternatives to deal with the variable subsurface conditions. Storm water management was designed to be contained in both retention and detention basins, which required very tall embankment sections. These were considered and designed as earthen dams. Included oversight of the quality control testing for all earthwork, foundations, steel erection, roofing, drainage installation, and pavement construction.

Temple University School of Podiatric Medicine Office and Parking Garage (Geotechnical Project Manager: 1986) - Philadelphia, PA
Mr. Kazaniwsky assumed the role of Geotechnical Project Manager responsible for the development of a geotechnical investigation program for a multi-story parking garage and office over-built on Race Street between 8th and 9th Streets. Because the building is uniquely situated over the Center City Commuter Tunnel, the building would need to span approximately 60 ft over the tunnel which in turn required maximization of the bearing capacity for drilled pier foundations. During construction he provided engineering direction and redesigned the piers to take advantage of locally better quality rock which was better than 50 tsf.

Seapointe Village - Lower Twp., NJ (Geotechnical Engineer: 1990-2006)
Mr. Kazaniwsky assumed the role of Geotechnical Engineer for the investigation and resulting construction of a residential condominium complex located on a barrier island in Cape May County on the New Jersey coast. Employed partial excavation, ground water monitoring, dewatering and surface stabilization to allow for the use of shallow footings and/or deep pile foundations for certain structures. Evaluated storm water recharge feasibility.

Gallery II Parking Garage, 11th and Filbert Streets, Philadelphia, PA - (Geotechnical Project Manager: 1985)
Mr. Kazaniwsky developed and implemented a geotechnical study for a 6 story parking garage facility constructed at 11th and Filbert Streets in Philadelphia, PA. Due to proximity of the Center City Commuter Tunnel and on the basis of subsurface conditions, utilized high capacity drilled pier foundations. He provided engineering consultation and oversight of drilled pier foundation construction, as well as subgrade preparation for support of the slab on-grade.

Coring of a pier shaft and evaluation of the concrete due to concrete quality problems was also performed.

Hilton Garden Inn Overbuild- Gallery II Garage, 11th and Filbert Streets, Philadelphia, PA (Geotechnical Project Manager: 1988)
Mr. Kazaniwsky developed and implemented a geotechnical study for a hotel structure overbuild over the constructed parking garage at 11th and Filbert Streets in Philadelphia, PA. Provided engineering evaluation of the existing drilled pier foundations to maximize the bearing capacity for support of portions of the building overbuild. Evaluated high capacity drilled pier foundations for portions of the overbuild that need to span certain portions of the existing garage and considering the vicinity of the Center City Commuter Tunnel.

Queens West Development Stages III and IV- Queens, NY (Chief Geotechnical Engineer: 2006-2007)
Mr. Kazaniwsky assumed the role of Chief Geotechnical Engineer during the completion of a geotechnical feasibility study in connection with a due diligence study being conducted for this project. The project site is located along the East River in Long Island City (Queens), NY and is approximately 30 acres in size. An AMTRAK and the Queens Midtown Tunnels traverse below the project site. Preliminary plans called for 12 residential towers up to 40 stories in height, and multiple 3 to 6 story garage structures. The purpose of this geotechnical study was to characterize the subsurface conditions on a preliminary basis and evaluate the impact of the conditions on foundations and anticipated site development. A total of 13 test borings were drilled at the project site. Due to the presence of deep heterogeneous fills, thick highly compressible silts, and localized boulders, as well as the presence of tunnels, alternative deep foundations such as H-piles, concrete filled pipe piles and micro piles were recommended based on specific subsurface conditions and location. Additionally, deep dynamic compaction and surcharging were recommended for roadways to stabilize the fill and silt and minimize post construction settlements.

University of Pennsylvania UDAG Development - Philadelphia, PA (Geotechnical Project Manager: 1982-1994)
Mr. Kazaniwsky assumed the role of Geotechnical Project Manager for this major health care facility project. The development consists of two biomedical research facilities, the CHOP Ambulatory Care Facility, Children's Seashore House, the CHOP Stokes Research Facility, a below grade parking facility and plaza, and a 6-story parking facility. All of the buildings have three levels of below grade parking, are typically up to 13 stories in height, and occupy an area of approximately 8 acres. Mr. Kazaniwsky was responsible for developing and implementing specific geotechnical investigations for each of these buildings which were built at separate times. He also evaluated alternative foundation systems and concluded that the cost-effectiveness and practicality of using straight shaft drilled piers with rock sockets was the most practical. Due to shallow ground water and deep basements, he also conducted in-place permeability tests and designed permanent subdrainage systems for most of the

buildings. During foundation and earthwork construction he provided engineering oversight and consultation regarding geotechnical-related issues.

Marriott Convention Hotel - Philadelphia, PA (Geotechnical Project Manager: 1996-1998)
Mr. Kazaniwsky assumed the role of Geotechnical Project Manager responsible for the development and implementation of a geotechnical exploration study for a 21-story hotel located at 12th and Market Streets in Philadelphia, PA. While alternative shallow and deep foundation systems were evaluated, a drilled pier foundation system was recommended that would bear in mica schist rock due to a shallow basement. Due to the presence of soft, liquefiable soils at basement level, he developed a subgrade stabilization method to act as a construction platform and provide support for the basement slab. During construction, he was responsible for oversight of the drilled pier foundations and subgrade preparation, as well as for providing consultation relating to geotechnical issues and foundation inspection.

The Murano, 2101 Market Street - Philadelphia, PA (Chief Geotechnical Engineer: 2006)
Mr. Kazaniwsky served as the chief geotechnical engineer overseeing the completion of a geotechnical investigation for this 45-story, $165 million, condominium tower built at 21st and Market Streets in Center City Philadelphia. Responsibilities included the planning, and coordination of oversight for a supplemental subsurface investigation consisting of Pressuremeter Testing (PMT) and Borehole Shear Testing (BST) of the site bedrock. Pavement subgrade recommendations were made and a pavement design was provided for the access driveways.

Commerce Square Twin Towers - Philadelphia, PA (Geotechnical Project Manager: 1984-1987)
Mr. Kazaniwsky assumed the role of Geotechnical Project Manager responsible for the preliminary and then final geotechnical engineering studies for each of two 40-story towers that were built at 22nd and Market Streets in Center City. Based on his evaluation of a combination of shallow footings and drilled pier foundations, drilled piers were utilized due to simplicity and ease of excavation, some of which were relatively shallow while most were deep. He also designed a permanent ground water control system based on results of in-place permeability testing, as well as developed a unique method of reducing lateral loads on basement walls by utilizing a compressible foam drainage board. During construction, he provided direction and consultation during the contractor's foundation and earthwork activities. To reduce costs, drilled pier sockets were continually redesigned based on the quality of rock that was encountered. He additionally provided monitoring and evaluation of vibrations and their impact on fresh concrete due to localized blasting for deep elevator pits.

Temple University, Temple University Health Science Garage - Philadelphia, PA (Geotechnical Project Manager: 1988)
Mr. Kazaniwsky assumed the role of Geotechnical Project Manager responsible for the development and implementation of a geotechnical study for a 4-story parking garage structure at 15th and North Carlisle Streets. Based on highly variable rock conditions, he evaluated various deep foundation systems and concluded that a straight shaft drilled pier socketed in weathered rock was most effective. Also developed an extensive soil exchange scheme for slab support due to extensive unstable on site soils and fills. Years after construction, he performed a comprehensive re-evaluation of the adequacy of existing foundations for the addition of two parking levels. Prepared alternative stabilization schemes, including pin-pile underpinning, where conditions warranted.

Paulsboro Marine Terminal Bridge and Roadway-Pilot Surcharge, Paulsboro/West Deptford, NJ (Chief Geotechnical Engineer: 2010)
Mr. Kazaniwsky was responsible for assisting the design engineer with planning and installation of geotechnical instrumentation for monitoring a pilot surcharge. The purpose of the pilot surcharge was to evaluate magnitude and rates of settlements, as well as the lateral deformation at the toe of the surcharge to be used in the final design of the roadway and bridge approaches. Mr. Kazaniwsky oversaw all aspects of the installation of the geotechnical instrumentation consisting of slope inclinometers with Sondex vertical settlement measuring capabilities and multi stage vibrating wire piezometers for measuring pore pressure dissipation in the compressible layer.

Hog Island Road Extension - Tinicum Twp., PA (Geotechnical Project Manager: 1999-2002)
Mr. Kazaniwsky directed the completion of a geotechnical investigation (2 phases) for a 3,500 LF extension and 2,000 LF realignment of Hog Island Road which serves as the main loop road around the Philadelphia International Airport. Because the locations of both the extension and realignment are situated over marshland that was hydraulically-filled, the subsurface conditions consisted of underconsolidated soft compressible organic silts. In order to establish stability and limit post-consolidation settlements, a preloading system was developed that consisted of an earthen surcharge and wick drains to accelerate the time of consolidation. An instrumentation system consisting of 20 vibrating wire piezometers and settlement platforms was subsequently designed to monitor the consolidation. A pile foundation system was developed to support a bridge. The work included monitoring of the piezometers and settlement plates, as well as load testing of bridge foundations, and inspecting the installation of production piles.

LA Department of Transportation and Development, I-10 Bridges over Lake Pontchartrain - St. Tammany and Orleans Parishes, LA (Geotechnical Consultant: 2005-2006)
Mr. Kazaniwsky was responsible for providing geotechnical engineering analyses

associated with the fast-track design of approximately 5-mile long parallel segmental bridges to replace an existing bridge that was severely damaged by Hurricane Katrina. The two parallel bridges consist of both low deck and high spans, with the high span subject to large barge collision loads. Tasks include: review of existing subsurface data from the existing bridge and provision of preliminary geotechnical analysis and recommendations for precast concrete piles and drilled piers; review of LADOTD-developed preliminary foundation systems; assist LADOTD with the development of a supplementary geotechnical sampling and laboratory testing program to be performed by LADOTD; assist LADOTD with the development of an advanced pile and drilled pier testing program to be performed by LADOTD; provide part-time oversight of the supplementary geotechnical sampling and the advanced pile and drilled pier testing programs; review the results of the supplementary geotechnical sampling and laboratory testing programs and re-evaluate the foundation systems in view of the supplementary data; review the results of the pile and drilled pier testing program and re-evaluate the foundation recommendations; provide assistance during the bid process and review of the submitted bids. (2006)

Camden Aquarium Parking Garage - Camden, NJ (Geotechnical Project Manager: 1988)
Mr. Kazaniwsky assumed the role of Geotechnical Project Manager during the completion of a geotechnical investigation for this 7-story parking garage located across from the New Jersey State Aquarium. The footprint of the structure was approximately 51,000 ft^2 with column loads that ranged from 600 to 1,300 kips. Due to a significant thickness of compressible organic silt, driven piles were recommended for support of the structure, with subsequent consultation and monitoring being provided during pile load testing and production pile installation.

Monopile Mooring System for Berth No. 2 Reconstruction at Beckett St. Terminal – Camden, NJ (Geotechnical Engineer: 2003)
Mr. Kazaniwsky directed the completion of a geotechnical investigation for this project which consisted of the analysis of a large-diameter (60-inch) monopile for lateral loading and drivability studies for pile installation, including the evaluation of subsurface investigation data obtained by others. The project involved the design of a permanent mooring for the bow line of a ship to be docked at the reconstructed Berth No. 2. at Beckett Street Terminal adjacent to the Delaware River. The permanent mooring was proposed to consist of a large (60 in.) diameter monopile. Mr. Kazaniwsky's responsibilities included an evaluation of the monopole system and modeling of alternative pile driving systems. A report was then prepared with recommendations for design and construction.

VA Department of Transportation, I-64/Mercury Boulevard Interchange - City of Hampton, VA (Chief Geotechnical Engineer: 1997-2003)
Mr. Kazaniwsky assumed the role of Chief Geotechnical Engineer for this $70 million urban interstate project that involved the addition of HOV lanes in the median of I-64 along a 2.6 mile section; auxiliary, acceleration and deceleration lanes; and the reconfiguration of an existing interchange with I-64 to include high-speed ramps, 5 new curved steel ramp bridges and 2 replacement bridges.

Mr. Kazaniwsky's responsibilities included the implementation of subsurface investigation and laboratory testing programs for over 110 test borings, pile foundation design for five (5) multi-span curved girder flyover bridges and two (2) major highway overpass bridges, design of over 150,000 sq. ft. of Mechanically Stabilized Earth (MSE) retaining walls using lightweight aggregate fills, slope stability, and design of six (6) miles of new highway. A geotechnical instrumentation system consisting of settlement platforms and vibrating wire piezometers was designed and installed. Load testing of deep pile foundations was also conducted.

SC Department of Transportation, Statewide Design-Build Bridge Replacement (Geotechnical Engineer: 2004-2006)
Mr. Kazaniwsky participated in the completion of geotechnical studies that were completed for this fast-tracked, design/build contract that included the replacement of 33 bridges throughout the state. Provided an evaluation of subsurface conditions, feasible foundation types, foundation design recommendations and pile driveability analyses (where applicable) for 6 replacement bridges. Driven piles were recommended for use as foundation support, while all substructure design for this project was completed in accordance with AASHTO Load and Resistance Factor Design (LRFD) specifications.

NJ Department of Transportation, NJ Route 9, Section 15 D Instrumentation - Atlantic County, NJ (Geotechnical Engineer: 2002)
Mr. Kazaniwsky directed the oversight and installation of specialty geotechnical instrumentation, including four (4) vibrating wire piezometers, seven (7) inclinometers and six (6) extensometers to monitor pore pressures, lateral displacements and vertical settlements induced by applied surcharge loads. Extensometers and inclinometers were installed to depths of 90 to 100 feet below ground surface under difficult drilling conditions. Included the establishment of baseline measurements for each instrument that was installed and training the owner representatives who were responsible for on-going monitoring.

St. Mary's RC Church Floor Slab and Foundation Deficiencies Claim - Cherry Hill, NJ (Geotechnical Consultant: 1990)
Mr. Kazaniwsky directed a subsurface study to establish alleged deficiencies in foundation and floor slab construction as part of an overall forensic study being performed by a team of experts. The study in fact verified that the foundations and floor slabs were found to be insufficient in view of the current loading conditions, and the potential for future problems was identified by this study. An expert report was prepared and verbal testimony was then provided on the behalf of the church.

Farnham Park Wetlands Restoration - Camden, NJ (Geotechnical Project Manager: 2004)

Mr. Kazaniwsky assumed the role of Project Manager for the geotechnical data acquisition activities his duties and responsibilities included cost estimating, contract preparation, scheduling, and coordination of field activities. He also acted as the client liaison and technical manager. TRC provided all test boring drilling, laboratory analysis and data interpretation. With the site being located along the Cooper River within a tidal wetlands area, the test borings were completed using ATV-mounted equipment due to extremely wet and soft conditions. Laboratory analysis of the subsoils will include a full suite of physical analysis in TRC's AASHTO-accredited soil mechanics laboratory.

1800 and 1880 JFK Boulevard Twin Office Towers - Philadelphia, PA (Geotechnical Engineer: 1980-1981)
Mr. Kazaniwsky assumed the role of Geotechnical Engineer during the completed of a preliminary and final investigation for each of two, 21-story office towers that were constructed in the 1800 block of JFK Boulevard in Center City Philadelphia. Concluded that a drilled pier foundation system designed for a 25 to 40 tsf rock bearing capacity could be utilized in the design. Provided engineering oversight during foundation construction and general earthwork, as well as redesigned socket lengths based on the rock that was encountered.

PA Department of Transportation, S.R. 3040, Section 01A/01B, Park Road Corridor - Berks County, PA (Chief Geotechnical Engineer: 1989-1992)
Mr. Kazaniwsky assumed the role of Chief Geotechnical Engineer responsible for all aspects of a subsurface investigation program and providing design recommendations for this project which involved the design of a four-lane limited access expressway on new alignment. A major portion of this project involved the construction of eight (8) new multi-span bridge structures along 5 miles of highway, all of which traversed highly solution-prone limestone formations. All of the new bridge crossings were grade separation structures, with two of the crossings representing dual bridge structures. Preliminary pavement design was performed for this project.

SC Department of Transportation, US 76 Bridge Replacement over Chattooga River on South Carolina/Georgia State Line (Geotechnical Engineer: 2005-2006)
Mr. Kazaniwsky assisted with the evaluation of subsurface conditions, feasible foundation types and foundation recommendations for this project which represented a major crossing of the Chattooga River between Oconee County, SC and Rabun County, Georgia. Due to the variable depth to rock that was encountered at substructure locations, a combination of driven piles and drilled shafts were recommended. He also participated in the development of preliminary soil nail wall evaluations for consideration as an alternative to performing large volume cuts in existing slopes and evaluated the stability of cut slopes and cantilever walls that were selected for use on the project. All substructure and wall evaluations for this project were performed in accordance with AASHTO Load and Resistance Factor Design (LRFD) specifications.

PA Department of Transportation, Stabilization of the Route 76 and Route 676 Interchange - Philadelphia, PA (Geotechnical Engineer: 1984-1990)
Mr. Kazaniwsky assumed the role of Geotechnical Engineer for this project site which was located over deep man-made fills and river silts adjacent to the Schuylkill River. Because of noticeable movements observed during construction, alternative schemes were evaluated for stabilization. These included the "net zero load" concept using cellular concrete, deep dynamic compaction, stone columns and deep foundations. An instrumentation program consisting of slope inclinometers and piezometers was subsequently implemented during construction to monitor the horizontal and vertical movement, as well as pore pressure, of the subsoils as a result of embankment loads. Load testing of pile foundations was also conducted.

NJ Department of Transportation, I-295, Section 1-BC, Embankment Instrumentation and Monitoring - Gloucester County, NJ (Chief Geotechnical Engineer: 1997)
Mr. Kazaniwsky designed and implemented an embankment instrumentation and monitoring program for a new NJDOT bridge over I-295. Installed vibrating wire piezometers and porous tube-type piezometers prior to construction of the main approach embankments for the bridge. Also provided monitoring of the pore pressure in compressible subsoils compared with height of fill, rate of placement, and settlements that were determined from settlement platforms. Also performed analyses to determine when completion of the embankment settlement would be achieved.

NJ Department of Transportation, Route 42 Widening, Section 13M/14S - Camden and Gloucester Counties, NJ (Chief Geotechnical Engineer: 1990-1993)
Mr. Kazaniwsky assumed the role of Chief Geotechnical Engineer involved with overseeing a geotechnical investigation for the widening of an existing highway from three lanes to four lanes in each direction, including three bridge structures. Length of the roadway that was subject to his work was 3½ miles. Project involved the installation of the sound barriers, culverts, retaining walls, signs and exterior lighting, as well as bridge widenings. A combination of deep and shallow foundations was utilized to support the structures.

NJ Department of Transportation, Route 47 Bridge Over Grassy Sound - Cape May County, NJ (Chief Geotechnical Engineer: 1997-2000)
Mr. Kazaniwsky was responsible for managing all aspects of a geotechnical study to investigate two bridge piers that were tilting, including determining the probable cause and providing recommendations to halt or mitigate additional tilting. The bridge structure itself consists of seven bridge spans, six piers, and two abutments supported on timber piles. A compaction grouting program was designed to stabilize the subsoils.

WV Department of Transportation, Division of Highways, Elkins Bypass, US 219 to Canfield - Randolph County, WV (Chief Geotechnical Engineer: 1996-1999)
Mr. Kazaniwsky assumed the role of Chief Geotechnical Engineer during the design of a new roadway through the Appalachian Mountains along Corridor H in West Virginia. Responsibilities for this project included: development of subsurface investigation and laboratory testing programs for over 120 test borings, stability analysis and design of rock cuts over 100 ft high in weak, steeply dipping shale bedrock, rock slope hazard reduction studies, stability analysis for roadway fill and embankments over 70 ft high, foundation design and analysis for two bridges and culverts, and the production of geotechnical engineering reports.

Plant 15-2B Crane Foundation Analysis, Sunoco Plant - Marcus Hook, PA (Geotechnical Project Manager: 2000)
Mr. Kazaniwsky assumed the role of Geotechnical Project Manager during the completion of geotechnical analyses associated with the placement of a Demag CC1800 track-mounted crane that would lift a maximum 150 kip load. From a soil-based analysis, it was determined that use of the crane would be feasible without subsurface modification. The primary concern, however, became the presence of subsurface utilities and their associated tolerable stresses and displacements upon load application and corresponding compression of the upper soil mass. Based on crane information provided by the client, it was determined that ultimate distributed loads of up to 10.5 ksf were possible during setup and/or operation directly under the crane tracks. Strictly from a soil performance standpoint, the use of continuous double-stacked matting placed in alternate directions to ensure rigidity was recommened. However, due to the concern for utility performance, it was stressed that consideration be given to the construction of a 3 ft thick working pad directly below the crane matting to aid in distributing and dissipating the applied loads.

Crane Foundation Analysis – Units 1232 & 431, Sunoco Plant – Philadelphia, PA (Geotechnical Project Manager: 2003)
Mr. Kazaniwsky assumed the role of Geotechnical Project Manager during this project which involved the completion of a geotechnical investigation associated with the placement of five (5) different cranes, each at a different location, as part of a regularly scheduled maintenance program. The first stage of our analysis evaluated the placement of a 500-ton Demag AC1200 crane and a 300-ton Grove GMK 6300 B crane near the CAT facility at Unit 1232. Two of the remaining cranes would be placed on the recovery side of Unit 1232 while the last crane would be placed in the street at Unit 431. The two cranes at Unit 1232 are a 50-ton Grove RT 750 and a 175-ton Grove GMK 5175, while the 500-ton crane at Unit 431 is a Grove GMK 7450. Analyses were performed at each of the lift sites to evaluate allowable contact pressures in view of existing subsoil conditions and subsurface utilities. Utilization of various matting and steel plating systems were utilized based on the site specific loacations.

SELECTED PUBLICATIONS AND PRESENTATIONS

Partos, A. and Kazaniwsky, P.W.,"Geoboard Reduces Lateral Earth Pressures", *Proceedings of North American Conference on Geosynthetics*, New Orleans, LA, 1987.

Partos, A. and Kazaniwsky, P.W.,"Case Histories of Shallow Foundations on Improved Soils", *Proceedings of Foundation Engineering Congress*, Evanston, IL, 1989.

Brinker, F.A., Kazaniwsky, P.W., Logan, M., "Case History Illustrating The Challenges of Foundation Design and Construction in Karst Terrain", *Fifth International Conference on Case Histories in Geotechnical Engineering*, New York, NY, April 2004.

PROFESSIONAL AFFILIATIONS

- Member, American Society of Civil Engineers
- Member, International Society for Soil Mechanics and Foundation Engineering
- Member, Deep Foundation Institute
- Member, American Society of Highway Engineers
- Member, International Code Council

STATE OF NEW YORK
PUBLIC SERVICE COMMISSION

Application of Galloo Island Wind Transmission Facility for a Certificate under Article VII of the Public Service Law

Case No. 18-T-0015

PRE-FILED TESTIMONY OF:

GREGORY LIBERMAN

SENIOR ENVIRONMENTAL PROJECT MANAGER

ENVIRONMENTAL DESIGN & RESEARCH

LANDSCAPE ARCHITECTURE, ENGINEERING & ENVIRONMENTAL SERVICES, D.P.C.

Q: Please state your name, employer, and business address.

A: Gregory Liberman, Environmental Design & Research, Landscape Architecture, Engineering & Environmental Services, D.P.C. (EDR), 217 Montgomery Street, Suite 1000, Syracuse, New York 13202.

Q: What is your position at EDR?

A: Senior Environmental Project Manager.

Q: How long have you been employed with EDR?

A: I have been employed at EDR since 2014.

Q: Please describe your educational background and professional experience.

A: I have a Bachelor of Science degree in Landscape Architecture from the University of Massachusetts at Amherst. I have more than 15 years of professional experience in environmental impact assessment, permitting and resource area restoration. I have served as a project manager and/or lead investigator for several energy infrastructure and renewable energy, as well as other development projects. I have particular education and expertise in natural resources management, stream and riverbank restoration, and Geographic Information Systems mapping and analysis.

Q: Please describe your current responsibilities with EDR.

A: In addition to my project manager responsibilities at EDR, I am responsible for ensuring project compliance with permitting regulations and requirements, including the National Environmental Policy Review Act, the State Environmental Quality Review Act, Articles 10 and VII of the New York Public Service Law, and state and federal wetland requirements.

Q: **Have you previously testified before the New York State Public Service Commission or Siting Board on Electric Generation?**

A: No.

Q: Have you previously served as an expert witness before any other court, agency, or other body on the subject you plan to offer testimony on today?

A: I have provided expert witness testimony before several municipal Zoning Boards of Appeal in New York State regarding multiple electric transmission projects, with a focus on environmental impact assessment, impact avoidance and impacts to community character.

Q: What is the purpose and scope of your testimony in this proceeding?

A: To sponsor certain portions of the Galloo Island Wind Transmission Facility Application or the Exhibits thereto.

Q: What portion(s) of the Application is your testimony sponsoring?

A: Exhibits 3, 4.1, 4.3, 4.6, 4.7, 4.8, 4.14, 7 and 8.

Q: Were these Exhibits, Application sections, or studies prepared by you or under your direction and supervision?

A: Yes.

Q: In your testimony, will you refer to, or otherwise rely upon, any studies, publications, data or documents produced by persons other than yourself/your company? If so, please cite these sources. [These are independent studies, etc.]

A: Yes, appendices referenced in the sections of the Application that I am sponsoring as set forth above.

Q: Does this conclude your testimony?

A: Yes.

Gregory S. Liberman
Senior Environmental Project Manager

Gregory Liberman is Senior Environmental Project Manager at EDR with more than 15 years of professional experience. He has experience in environmental impact assessment, permitting and resource area restoration. He has served as a Project Manager and/or lead investigator for several large- and small-scale energy infrastructure, renewable, land development, institutional development projects. In this framework, he brings a combination of direct project experience and understanding with a broad environmental knowledge base.

Gregory's responsibilities also include conducting environmental review, impact analysis, and permitting, proficiency in multiple permitting regulations and requirements, such as the National Environmental Policy Act, the New York State Environmental Quality Review Act, Article VII and Article 10 of the New York Public Service Law, and state and federal wetland regulations. Through a combination of project experience, education and specialized training, he has experience with natural resources management, stream and riverbank restorations, Geographic Information Systems mapping and analysis, Rosgen-type surveys, stormwater pollution prevention plans, and wetland delineation and permitting. He recently served as the Chair of the New York Water Environment Association Stormwater Task Force and the Vice-Chair of the Town of DeWitt Planning Board.

education

University of Massachusetts, Amherst, MA, *Bachelor of Science*, 2000.

professional affiliations

Chair, New York Water Environment Association (NYWEA) Stormwater Task Force (past)

Vice-Chairperson, Town of Dewitt Planning Board (past)

employment history

Senior Environmental Project Manager, Environmental Design & Research, Landscape Architecture, Engineering & Environmental Services, D.P.C., Syracuse, NY, 2014 - Present.

Project Manager, GHD, Cazenovia, NY, 2012-2014.

Project Scientist, GHD (formerly Stearns & Wheler), Cazenovia, NY, 2006-2012.

Research Assistant, Center for Brownfield Studies, State University of New York College of Environmental Science and Forestry, Syracuse, NY, 2004-2006.

Designer, New England Environmental Inc., Amherst, MA, 2000-2004

project experience

Central Hudson Gas & Electric G Line North 69 kV Transmission Line Rebuild, Dutchess County, NY – Managed the preparation of a Part 102 Report for submittal to the New York State Public Services Commission for a Central Hudson Gas & Electric 8.5-mile electrical transmission line rebuild project located across multiple municipalities. Also managed the SEQRA and municipal review process, which resulted in planning board and zoning board of appeals approval (ZBA) from multiple municipal boards. Oversaw the preparation of support studies (wetlands, visual, cultural, and SWPPP) along with Plan and Profile drawings, which served as the basis for the PSC and local municipal approvals.

National Grid Wolf Road - Menands 115 kV Transmission Line Re-Conductoring, Towns of Menands and Colonie, Albany County, NY – Directed the preparation of a Part 102 Report for submittal to the New York State Public Services Commission for a National Grid owned 4-mile electrical transmission line reconductoring project. Responsibilities included attending various work sessions, overseeing required environmental and ecological field studies, and coordination of the SWPPP permitting process.

Central Hudson Gas & Electric WH-1/2 69 kV Transmission Line Re-build, Wawarsing, Ulster County, NY – Directed the preparation of a Part 102 Report to be submitted to the New York State Public Services Commission for a Central Hudson Gas & Electric Corp owned 11-mile electrical transmission line rebuild. EDR's responsibilities included attending various work sessions with municipal staff, directing other subconsultants, coordinating internal staff resources, and assuring a complete Part 102 Report/application was prepared/submitted in accordance with the PSC and local municipal requirements.

National Grid Edic Substation Expansion, Town of Marcy, Oneida County, NY – Managed the local Planning Board and Zoning Board of Appeals review of an expansion and new control house at the Edic Substation. Project included delineation of state and federal wetlands, preparation of an alternatives analysis, a SWPPP, and SEQRA compliance.

National Grid Van Dyke Road Electrical Sub-Station, Town of Bethlehem, Albany County, NY – Managed the local Planning Board and Zoning Board of Appeals review for a new National Grid electrical substation. Project included preparation of an alternatives analysis, state and federal wetland delineation and permitting and endangered species investigation, a Visual Impact Assessment, a SWPPP, and SEQRA compliance.

Galloo Island Wind, Jefferson County, NY – Managed the regulatory compliance services associated with a 40 turbine, 125 MW project being reviewed under Article 10 of the Public Service Law. To date, EDR has prepared the Preliminary Scoping Statement and Stipulations in support of a forthcoming Article 10 Application. Also managed the completion of the following support studies: wetland delineation report, socio-economic report, visual impact assessment, and invasive species control plan.

Central Hudson Gas & Electric A&C 115kV Transmission Line Upgrades, Towns of Pleasant Valley, LaGrange, Wappinger and East Fishkill, Dutchess County, NY – Coordinated preparation of the Environmental Management & Construction Plan (EM&CP) for upgrades to an existing 115 kV line in support of an Article VII filing to the Public Service Commission. Also coordinated with EDR compliance monitoring staff regarding erosion and sediment control, agricultural protections and Blanding's turtle habitat impact avoidance.

Bluestone Wind, Broome County, NY – Managed regulatory compliance services associated with a 40 turbine, 125 MW project being reviewed under Article 10 of the Public Service Law. To date, EDR has prepared the Public Involvement Program Plan and the Preliminary Scoping Statement.

National Grid Porter Substation Expansion, Town of Marcy, Oneida County, NY - Managed the local Planning Board and Zoning Board of Appeals applications for an expansion and site improvements at the Edic Substation. Project included delineation of state and federal wetlands, preparation of an alternatives analysis, a SWPPP, and SEQRA compliance.

National Grid Milton Substation Expansion, Town of Camillus, Onondaga County, NY - Managed the local Planning Board and Zoning Board of Appeals applications for an expansion and site improvements at the Milton Substation. Project included delineation of state and federal wetlands, preparation of an alternatives analysis, a SWPPP, and SEQRA compliance. Also managed the preparation of noise impact assessment in support of local permitting review.

Cassadaga Wind, Chautauqua County, NY – Coordinated the preparation of the preliminary design drawings for the 70 turbine project being reviewed under Article 10 of the Public Service Law.

Jericho Rise Wind Farm, Towns of Bellmont and Chateaguy, Franklin County, NY – Coordinated the preparation of the wetland permit application and supporting documentation for this 37-turbine, 78 MW project. Wetland/stream permits were obtained from the U.S. Army Corps of Engineers and the NYS Department of Environmental Conservation.

New York State Office of General Services (NYS OGS) for New York State Department of Environmental Conservation (NYS DEC), Horseshoe Pond Dam, Essex County, NY – Serving as a sub-consultant on an NYS OGS term contract work order, managed wetland delineations and ecological assessments around the dam to support of decommissioning, proposed removal, and flood mitigation efforts.

Broome County Industrial Development Corporation - Dick's Sporting Goods Distribution Center, Town of Conklin, NY – Directed/Managed the SEQRA and wetland permitting efforts for a new 900,000 square foot distribution facility. Project included preparation of state and federal wetland delineation and permitting, wetland mitigation design and endangered species investigation, a stormwater pollution prevention plan (SWPPP), and local Town Board and Planning Board approval.

Rising Warrior Stream Mitigation Bank, Jefferson County, NY – As a subconsultant, managed the Rising Stream Mitigation Bank project for Fort Drum Natural Resources Division. The project included the development of a Stream Mitigation Bank Prospectus reports along with a supporting Stream Mitigation Banking Instrument. The project also included the development of a 1,400 linear feet natural channel design for the Rising Warrior branch of Pleasant Creek. Services include geomorphological assessments, Rosgen-type surveys as well as 30% Conceptual Restoration Design and Report.

City of Rome UV Facility Permitting, City of Rome, Oneida County, NY – Directed/managed the environmental permitting and SEQRA for the City of Rome proposed UV Treatment Facility. Project included preparation of Joint Application for Permit and report in support of a NYSDEC Article 15 permit, preparation of an alternatives analysis, a SWPPP and civil design for the on-site facilities, roads, and stream crossings.

Binghamton-Johnson City Joint Sewage Treatment Plant Improvements, Broome County, NY – Directed/managed the environmental permitting and SEQRA review for the rehabilitation and upgrades of the Binghamton-Johnson City Joint Sewage Treatment Plant. Project included preparation of Joint

Application for Permit and report to be submitted to the NYSDEC and U.S. Army Corps in support of an Article 15 permit and Nationwide Permit No. 12 respectively. Project also include the preparation of a SWPPP and landscape design.

Westchester County Department of Public Works (DPW) Various Dams, Westchester County, NY – Managed wetland delineations, functions, and values assessment around the dam in support of decommissioning, proposed removal, and flood mitigation efforts for Gedney Pond Dam, Pelham Lake Dam, Wampus Lake Reservoir Dam, and Oscawana Island Park Pond #1 Dam.

New York State Governor's Office of Storm Recovery (GOSR) Mini-Bid for Environmental Services - Managed multiple contracts as sub-consultant to others to assess National Environmental Policy Act (NEPA), U.S. Housing & Urban Development, and SEQRA classifications and prepare environmental screenings for various local infrastructure improvement projects to improve facilities impacted by Superstorm Sandy and Hurricane Irene and protect against damage from potential future flooding events.

Peach Lake Environmental Center, Peach Lake, Westchester County, NY – *Prior to EDR,* prepared Environmental Assessment Report in support of the new wastewater treatment facility location. The project was located within the sensitive New York City Drinking Watershed so additional permitting and coordination was required with New York City Department of Environmental Protection. Worked directly with involved agencies to expedite the permitting review in order to secure American Recovery and Reinvestment Act funding.

Clinton Street Combined Sewer Overflow (CSO) Storage Facility, Downtown Syracuse, NY – *Prior to EDR,* prepared a Pre-Construction Notification (PCN) Report and SWPPP for Onondaga County's 6 million-gallon CSO Storage Facility. The facility consists of three subsurface tunnels located with an urban parking lot. As part of the surface restoration and parking lot enhancement, permits were required to comply with Section 404 Nationwide Permit No. 12 as well as the NYS DEC General Permit for Stormwater Discharges from Construction Activities. Reports and required field services were provided to obtain coverage under these permits including the design of two bio-retention basins, dry vegetated swale, 10 percent decrease in impervious surface and a stormwater reuse for CSO flushing.

Gallagher Residence, Darien, CT - *Prior to EDR,* responsible for stormwater management design and local permitting for the proposed single family home reconstruction. Project was in close proximity to regulated wetlands and watercourse and required permitting from local EPC and Planning Board. Designed two rain gardens and bio-retention systems to provide multiple pathways for treating runoff. Rain gardens were design and planted with native plant species to fit into the surround landscape.

Syracuse University West Campus Stormwater Master Plan, Syracuse, NY – *Prior to EDR,* managed the development of a stormwater and infrastructure master plan for 16-acres area known as West Campus at Syracuse University. Developed runoff and drainage calculations and assessment for entire area, consisting of eight separate lots and 10 City-owned roads. Project goal was to assess potential development impacts to infrastructure and CSOs. Plan also include feasibility design for water quality, runoff reduction and rate control BMPs including several green infrastructure measures.

Syracuse University Carmelo K. Anthony Basketball Practice Facility, Syracuse, NY – *Prior to EDR,* responsible for stormwater permitting for a new 40,000 square foot basketball training and educational center which includes: A two-court gymnasium, athlete and staff locker facilities and a fitness center as well as site amenities including a new fire access lane and parking modifications. The stormwater drainage design proved challenging due to various physical and programmatic limitations. Therefore, an underground water quality unit was proposed to treat stormwater runoff prior to its discharge into a local creek. The project was subject to State Pollutant Discharge Elimination System (SPDES) and County standards as well as local city stormwater ordinances. One comprehensive SWPPP was prepared which illustrated the erosion and sediment control plan and post-development stormwater controls. The SWPPP was approved without revision by all three governing agencies.

Foundry Brook Stream Restoration, Putnam County, NY - *Prior to EDR,* project Manager and lead designer for stream restoration design services at a section of Foundry Brook breached during Hurricane Irene. Work involved a restoration design and site grading at degraded stream bank within the future West Point Foundry Park (owned by Scenic Hudson) preserve along Foundry Marsh. High intensity rainfall scoured and eroded over 150 feet of stream bank and split Foundry Brook into separate channels. The project included an assessment of the overall watershed to identify anticipated flood elevations of the 1, 10 and 100 years' storms. This was used as the basis for a green gabion restoration design which was constructed in March 2012.

Haverstraw Multiple Separate Storm Sewer Systems (MS4) Compliance, Town of Haverstraw, Rockland County, NY – *Prior to EDR,* managed the compliance and reporting activities for the Town's MS4 program for a four-year period. The project included services across six minimum control measures including the development of an overall stormwater management plan, Illicit Discharge Detection & Elimination (IDDE) reports and Geographic Information System (GIS) Mapping of the Town storm-sewer sheds. Assisted in multiple audits with the NYS DEC resulting in Town successfully meeting MS4 expectations and avoiding penalties or fines.

Bowline Point Park Restoration, Town of Haverstraw, Rockland County, NY – *Prior to EDR,* managed the design and permitting of the Bowline Point Park shoreline restoration, following damages from superstorm Sandy to 700 feet of park located directly on the Hudson River. Project included Federal Emergency Management Agency (FEMA) coordination, restoration design permitting and construction observation.

Hunting Creek Restoration, Town of Thurmont, MD – *Prior to EDR,* managed the design and permitting for a 1,200 linear foot restoration of Hunting Creek. Project included coordination with state agencies, permitting with state agencies and U.S. Army Corps of Engineers (USACOE), restoration and natural channel design as well as bidding services.

Rockland County Sewer District, Rockland County, NY – *Prior to EDR,* provided wetland delineations services, NYS DEC Article 24 and USACOE nationwide permitting for a new county-wide sanitary collection system, including multiple stream crossings.

West Brook Conservation Initiative– *Prior to EDR,* provided technical oversight for a proposed ±1.5-acre stormwater wetland to be constructed adjacent to Lake George. Based on the client's need for improved water quality, the constructed wetland was designed to renovate untreated road runoff prior to its discharge into the Lake by reducing nitrogen and phosphorous loading. In addition, the constructed wetland provides the local community with an opportunity for environmental education.

New Rochelle Wastewater Treatment Plant, Westchester County, NY - *Prior to EDR,* obtained NYS DEC Tidal Wetlands Permit for infrastructure improvements at the Treatment Plant.

Mohawk Valley Water Authority Water Storage Tank, Mohawk Valley, NY - *Prior to EDR,* prepared SWPPP and obtained NYS DEC Article 24 Permit for a new one-million-gallon storage tank with driveway and site improvement.

Flood Mitigation Project, Village of Deposit, NY - *Prior to EDR,* responsible for wetland and stormwater permitting as part of a comprehensive flood mitigation upgrade. Obtained NYS DEC and USACOE permit for a major stream bank stabilization effort on the West Branch of the Delaware River. A stormwater management plan that met State standards was included as part of the capital improvements project. The stormwater management plan was approved by several stakeholders including the Village, NYS DEC, USACOE, and the Delaware River Basin Commission.

Five Mile Creek Bioengineering, Broome County, NY - *Prior to EDR,* lead designer for bioengineering design at a severely eroded section of Five Mile Creek behind a private residential property. Erosion due to a flashy storm washed away over 10 feet of land and threatened existing landscape features. Design was developed to accommodate construction with light equipment to comply with local environmental regulations. The plan consisted of vegetated geolifts planted with native Willow and Dogwood cuttings. The project was built in 2007, and has held up to several recent major storm events.

Brixius Creek Restoration, Broome County, NY - *Prior to EDR,* project designer responsible for planning, design and permitting for the reconstruction of 600 linear feet section of Brixius Creek. Work included regrading entire reach, installing a series of stone cross vanes to re-establish a flat stream profile and restoring both banks with stone and vegetation to prevent long-term scour and erosion.

Land-use Regulation Evaluation and Conservation Plan, Town of Yorktown, Westchester County, NY – *Prior to EDR,* lead Investigator responsible for evaluation of existing land-use regulations and ordinances as part of an overall conservation and biodiversity plan. Work included the evaluation of the Town's land-use regulations to identify opportunities to improve operations and environmental quality with a focus on land development, flood management, SEQRA, stormwater management and wetland resources.

Constructed Wetlands for Wastewater Treatment, Town of Plymouth, MA – *Prior to EDR,* evaluated the feasibility of using constructed wetlands for secondary wastewater treatment at a newly constructed wastewater treatment facility in the Eel River Watershed.

St Luke's Parrish, Town of Darien, CT - *Prior to EDR,* conducted field investigations and natural resource assessment in support of Town Environmental Protection Commission (EPC) permit for proposed institutional development. Development included three new residence facilities, parking and utilities improvements.

Proposed YMCA Facility, Town of Westport, CT - *Prior to EDR,* provided environmental and site design review for the Westport EPC for a proposed new YMCA facility. Critical items for review include site development with upland review areas, new parking. and stormwater management design.

presentations

Presenter, "Stormwater and Green Infrastructure Planning," at New York Water Environment Association Annual Meeting, New York, NY, 2012.

Presenter, "Regional Planning of Green Infrastructure Retrofits," at Growing Green Infrastructure Conference. Syracuse, NY, 2010.

Presenter, "Practical Stormwater Management Options for Challenging Sites," Society of Wetland Scientists Annual Conference. Washington, DC, 2008.

Presenter, "Incorporating Visual Quality & Aesthetics into Environmental Design," the New York State Wetlands Forum Annual Conference. Lake Placid, New York, 2007.

Presenter, "Successful Wetland Mitigation: Incorporating Flexibility into Design," at American Society of Landscape Architects Annual Meeting. Salt Lake City, Utah. 2005.

Presenter, "Techniques for Watershed Assessment: From Site Erosion to Landscape Level Understanding," at Association of State Wetland Managers National Symposium, Nashua, New Hampshire, 2003.

Presenter, "Riverbank Erosion Mapping Using GIS & GPS Technologies," at Society of Wetland Scientists Annual Conference, Lake Placid, New York, 2002

STATE OF NEW YORK
PUBLIC SERVICE COMMISSION

Application of Galloo Island Wind Transmission Facility for a Certificate under Article VII of the Public Service Law

Case No. 18-T-0015

PRE-FILED TESTIMONY OF:

STEVEN J. MACDONALD

SENIOR PROJECT MANAGER / CHIEF HYDROGRAPHER

ALPINE OCEAN SEISMIC SURVEYS INC.

Q: Please state your name, employer, and business address.

A: Steven J. MacDonald, Alpine Ocean seismic Surveys Inc. (Alpine), 155 Hudson Avenue, Norwood, NJ 07648.

Q: What is your position at Alpine?

A: I am a Senior Project Manager and the Chief Hydrographer.

Q: How long have you been employed with Alpine?

A: I have been employed with Alpine since February 2016.

Q: **Have you previously testified before the New York State Public Service Commission or Siting Board on Electric Generation?**

A: No.

Q: Have you previously served as an expert witness before any other court, agency, or other body on the subject you plan to offer testimony on today?

A: No.

Q: What is the purpose and scope of your testimony in this proceeding?

A: To sponsor certain portions of the Galloo Island Wind Transmission Facility Application or the Exhibits thereto.

Q: What portion(s) of the Application is your testimony sponsoring?

A: Exhibits 4.4 and 4.11.

Q: Were these Exhibits, Application sections, or studies prepared by you or under your direction and supervision?

A: Yes.

Q: In your testimony, will you refer to, or otherwise rely upon, any studies, publications, data or documents produced by persons other than yourself/your company? If so, please cite these sources. [These are independent studies, etc.]

A: Yes, appendices referenced in the section of the Application that I am sponsoring as set forth above.

Q: Does this conclude your testimony?

A: Yes.

Curriculum Vitae

Name	Steven J MacDonald
Date joined Alpine	01 February 2016
Job Title	Senior Project Manager | Chief Hydrographer
Job Description	Mr. MacDonald is a Senior Project Manager and the Chief Hydrographer at Alpine Ocean Seismic Survey. His main role at Alpine involves project management, employee development, and overseeing all aspects of hydrography within the company.

Qualifications & Accreditations

Experience

Mr. MacDonald has over ten years of professional experience in the fields of hydrographic surveying, marine positioning, geophysics, oceanography and marine geology. Mr. MacDonald is a Certified Hydrographer, Registered Professional Land Surveyor, and Professional Engineer. His multidisciplinary background also includes ocean engineering, signal processing and acoustics, autonomous unmanned vehicle (AUV) surveys, remotely operated vehicle (ROV) operations and marine archaeological surveying. Mr. MacDonald spent considerable time offshore, working aboard vessels performing surveys for NOAA charting, disaster response, environmental baselines, dredging, subsea asset inspection, subsea asset route / pre-installation, cable and pipeline installations, and decommissioning. As a Surveyor and Party Chief aboard these vessels he participated in numerous nearshore and offshore projects, interfacing with clients and their representatives to meet project objectives. In his time as a Senior Project Manager with Alpine Ocean Seismic Survey, Mr. MacDonald has managed over 10 projects including HVDC and HVAC submarine cable inspections, offshore wind farm and cable route investigations, hydrographic surveying, vessel positioning, and site hazard clearance surveys. Mr. MacDonald has conducted and managed hydrographic and geophysical survey work in numerous marine and lacustrine environments around the world including the Atlantic, Pacific and Indian Oceans, the Bering, Mediterranean and Caribbean Seas, the Gulf of Mexico and abundant rivers, lakes and waterways throughout the coastal United States and Canada.

American Congress on Surveying and Mapping (ACSM) Certified Hydrographer (No. 277)
Registered Professional Land Surveyor - Alaska (AK 14835)
Registered Professional Land Surveyor – New Jersey (24GS04337600)
Professional Engineer (NB M7561)

Fields of Competence

- Marine geophysical surveying (Magnetometer, Side Scan Sonar, Subbottom Sonar)
- Hydrographic surveying (Multibeam and Singlebeam Echosounders)
- Horizontal and Vertical Control Networks
- Land surveying and Dimensional Control
- Laser Scanning
- Geotechnical sampling
- Vessel navigation and positioning

Alpine Ocean Seismic Surveys Inc
155 Hudson Avenue, Norwood, NJ 07648 USA
Telephone (201) 768-8000 Fax (201) 768-5750
www.alpineocean.com

Curriculum Vitae

Courses Attended

B.S. Science in Engineering, Geodesy & Geomatics Engineering, University of New Brunswick, 2008

Key Industry Sectors

- Renewable Energy
- Oil & Gas
- Nautical Charting Surveys
- Subsea IRM
- Subsea Construction

Key Projects

Project Manager/Party Chief, ***Inspire NYSERDA Offshore Survey*** –Alpine was contracted by Inspire to collect multibeam bathymetry, acoustic backscatter data and water column data while also supporting the deployment and operation of Inspire's Sediment Profile Interface (SPI) camera system. This work was conducted in the waters of New York Bight as part of the New York State Energy Research & Development Agency's (NYSERDA) New York State Offshore Wind Development Planning Processes. Using Alpine's R/V Shearwater over 1,500 NM of dual head multibeam was collected. Mr. MacDonald's role was to act as the Party Chief and to manage the project.

Chief Hydrographer, ***Massachusetts - Vineyard Wind Marine Cable Route Survey*** - Marine Cable Route Survey requiring hydrographic and geophysical survey operations offshore of Cape Cod, MA. Project included multibeam, singlebeam sonar, side scan sonar, gradiometer, subbottom profiler, and single channel seismic. Responsible for vessel navigation and bathymetry sensor installation, sea trials, calibrations, QA/QC, and survey planning.

Chief Hydrographer, ***Rhode Island - DONG Energy Marine Cable Route Survey*** - Marine Cable Route Survey requiring hydrographic and geophysical survey operations along the Sakonnet River. Project included multibeam, side scan sonar, gradiometer, subbottom profiler, and single channel seismic. Responsible for vessel navigation and bathymetry sensor installation, sea trials, calibrations, QA/QC, and survey planning. Performed bathymetric and acoustic backscatter processing, and reviewed all final bathymetry deliverables.

Project Manager, ***USACE Survey Assateague Island and Ocean City Inlet*** - Alpine was contracted on behalf of Taylor Engineering to undertake beach topographical and nearshore hydrographic surveys of Assateague Island and Ocean City Inlet. The surveys were conducted to provide a basis for estimating the effects of dredging material placement and near shore coastal processes on Assateague Island. In addition the surveys provide adequate information to assess the natural and man-induced changes to the flood tidal shoal, inlet, and ebb tidal shoal complex of Ocean City Inlet. Mr. MacDonald acted as Party Chief while onsite for the field effort along with overseeing the project management and data processing. Field data collection included multibeam echo sounding, single beam echo sounding, beach sled profiling and land topographic surveying.

Project Manager, ***Virginia - Alcatel Marine Cable Route Survey*** - Marine Cable Route Survey requiring hydrographic and geophysical survey operations offshore of Virginia Beach, VA. Project included multibeam, side scan sonar, gradiometer,

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www.alpineocean.com

subbottom profiler, and grab sampling. Survey data was acquired with an offshore vessel and a smaller nearshore vessel, to complete survey operations from 3 meter water depth to 30 kilometers offshore. Responsible for project logistics, data QA/QC, technical support, and deliverables.

Project Manager, ***Apex Clean Energy Wind Farm Project, Lake Ontario, NY*** – Mr. MacDonald participated in and managed geophysical and bathymetric surveys along the proposed export cable route for a wind farm project to be developed on a private island in Lake Ontario near the Thousand Islands. The freshwater surveys extended from the Island to Oswego, NY and passed through water depths exceeding 100 meters. In addition, geotechnical sampling, including vibratory coring and grab sampling was conducted to support chemical and biological regulatory analysis.

Project Manager, ***California - TE Subcom Marine Cable Route Survey*** - Marine Cable Route Survey requiring hydrographic and geophysical survey operations offshore of Hermosa Beach, CA. Project included multibeam, side scan sonar, magnetometer, subbottom profiler, and grab sampling. Survey data was acquired with a nearshore vessel along two different routes out to seven kilometers offshore. Responsible for project logistics, onsite Party Chief, data acquisition, data QA/QC, data processing, and deliverables. Project included the use of Post Processed Kinematic (PPK) to obtain greater positional accuracies.

STATE OF NEW YORK
PUBLIC SERVICE COMMISSION

Application of Galloo Island Wind Transmission Facility for a Certificate under Article 7 of the Public Service Law

Case No. 18-T-0015

PRE-FILED TESTIMONY OF:

ROBERT D. O'NEAL

PRINCIPAL, EPSILON ASSOCIATES, INC.

Q: Please state your name, employer, and business address.

A: Robert D. O'Neal, Epsilon Associates, Inc. (Epsilon), 3 Mill & Main Place, Maynard, MA 01754.

Q: What is your position at Epsilon?

A: I am a Principal at Epsilon.

Q: How long have you been employed with Epsilon?

A: I have been employed by Epsilon for 17 years.

Q: Please describe your educational background and professional experience.

A: I have a Bachelor of Arts in Engineering Science from Dartmouth College and a Master of Science in Atmospheric Science from Colorado State University. I am a Certified Consulting Meteorologist (CCM) and am Board Certified through the Institute of Noise Control Engineering (INCE) and served on INCE's Board of Directors from 2014–2016. I am also a member of the Acoustical Society of America. I have over 30 years of experience in the areas of community noise impact assessments, meteorological data and analyses, and air quality modeling. My noise impact evaluation experience includes design and implementation of sound level measurement programs, modeling of future impacts, conceptual mitigation analyses and compliance testing. I have been involved in assessing noise from wind projects since 2004 and have authored several articles on wind turbine noise and given numerous conference presentations on the subject. Please see the attached resume for details.

Q: Please describe your current responsibilities with Epsilon.

A: As a Principal of Epsilon Associates, I share in responsibility for overall and operation of the company. As the leader of the Acoustics Group, I manage staff and assign resources on our noise-related projects. In addition, I perform technical studies myself on wind energy projects ranging from sound level measurements, sound modeling, noise control design, and expert testimony.

Q: Have you previously testified before the New York State Public Service Commission or Siting Board on Electric Generation?

A: Yes. I testified in 2003 on behalf of Besicorp-Empire Development Company, LLC's 505 MW combined cycle cogeneration plan, Rensselaer, NY [Article X Case No. 00-F-2057].

Q: Have you previously served as an expert witness before any other court, agency, or other body on the subject you plan to offer testimony on today?

A: Yes. I have testified on noise issues before numerous agencies, including the Maine Board of Environmental Protection, the Massachusetts Energy Facilities Siting Board, the Environmental Review Tribunal, Ontario, Canada, the Vermont Superior Court, and the New Hampshire Site Evaluation Committee, and in many other judicial and quasi-judicial settings.

Q: What is the purpose and scope of your testimony in this proceeding?

A: To sponsor certain portions of the Galloo Island Wind Transmission Facility Application or the Exhibits thereto.

Q: What portion(s) of the Application is your testimony sponsoring?

A: Exhibit 4.13.

Q: Were these Exhibits, Application sections, or studies prepared by you or under your direction and supervision?

A: Yes.

Q: In your testimony, will you refer to, or otherwise rely upon, any studies, publications, data or documents produced by persons other than yourself/your company? If so, please cite these sources. [These are independent studies, etc.]

A: Yes, appendices referenced in the section of the Application that I am sponsoring as set forth above.

Q: Does this conclude your testimony?

A: Yes.

Epsilon
ASSOCIATES INC.

Robert D. O'Neal, CCM, INCE Board Certified

Principal

EDUCATION

M.S., Atmospheric Science, Colorado State University

B.A., Engineering Science, Dartmouth College

PROFESSIONAL REGISTRATION

Certified Consulting Meteorologist, #578

Institute of Noise Control Engineering, Board Certified

PROFESSIONAL MEMBERSHIPS

American Meteorological Society

Air and Waste Management Association

Institute of Noise Control Engineers (INCE), Board Certified Member, Board of Directors (2014-2016)

Acoustical Society of America

A Principal of the firm, Mr. O'Neal is a Certified Consulting Meteorologist with over 30 years of experience in the areas of community noise impact assessments, meteorological data collection and analyses, and air quality modeling. Mr. O'Neal's noise impact evaluation experience includes design and implementation of sound level measurement programs, modeling of future impacts, conceptual mitigation analyses, compliance testing, and expert witness testimony.

His expert witness testimony experience includes state and local boards, courts of law, and adjudicatory hearings. Specifically, Rob has testified before the MA Energy Facilities Siting Board, Maine Board of Environmental Protection, Vermont Superior Court, NH Site Evaluation Committee, NY DEC Administrative Law Judge, 42nd District Court of Texas, MA Land Court, Environmental Review Tribunals (Ontario, Canada), and Boards of County Commissioners.

Rob is a nationally recognized acoustics expert in the wind energy field having performed noise impact assessments in over 25 states across the U.S. and Canada. Other industries served include fossil fuel power generation facilities, hard rock quarries, aggregate handling, asphalt and concrete plants, C&D processing facilities, landfills, real estate development, and mobile sources.

His air quality background involves applying air quality dispersion models for regulatory permitting applications, as well as for general air quality impact evaluations. He has experience with the CALMET/CALPUFF modeling system used to evaluate visibility and acid deposition impacts in Class I areas.

Mr. O'Neal is active on siting and environmental committees associated with the wind and materials handling industries. He has presented the results of wind turbine low frequency noise and infrasound research at major conferences and peer-reviewed scientific journals. In addition, Rob has been an invited speaker at conferences on a variety of noise and meteorological topics.

PROFESSIONAL EXPERIENCE

Wind Energy Projects

- *Apex Clean Energy – Lighthouse Wind, Orleans & Niagara Counties, NY.* Mr. O'Neal developed an extensive sound level measurement and modeling program for a proposed 200-megawatt (MW) wind farm in western NY. In addition to the technical noise studies, Epsilon provided input and response to comments for the Preliminary Scoping Statement and Stipulations as part of the Article 10 permitting process. The results will be presented as expert witness testimony during the NYS Public Service Board public hearings.

- *Avangrid Renewables– North Ridge Wind, St. Lawrence County, NY.* Mr. O'Neal developed an extensive sound level measurement and modeling program for a proposed 100-megawatt (MW) wind farm in northern NY. In addition to the technical noise studies, Epsilon provided technical support as part of the Article 10 permitting process.

- *Iberdrola Renewables – Groton Wind, Groton, NH. Mr. O'Neal developed an extensive sound level measurement and modeling program for a proposed 48-megawatt (MW) wind farm. Concurrent sound level data and meteorological data were collected and analyzed and the results were presented as expert witness testimony at community open houses and during the Site Evaluation Committee public hearings.*

- *Massachusetts Clean Energy Center – Research Study on Wind Turbine Acoustics. The study includes measuring sound emissions from a variety of operating wind turbines in the Commonwealth of Massachusetts. Fieldwork includes measuring both the level and quality of sound emissions from operating wind turbines under various wind regimes and topography. To better understand how wind speed and wind direction vary over the turbine height, meteorological data are collected using on-site meteorological towers and LiDAR systems. Acoustical data are measured at various distances from the wind turbines and include broadband, one-third octave band, low frequency and infrasound, and interior/exterior sound levels.*

- *FPL Energy – Horse Hollow Wind Energy Center, Taylor County, TX.* Mr. O'Neal developed and executed an extensive sound level measurement program for a 735 MW wind farm. Concurrent sound level data, meteorological data, and wind turbine power output data were collected and analyzed and the results were used in legal proceedings as part of expert witness testimony in the case.

Independent Power Projects

- *Braintree Electric Light Department, Braintree, MA.* Mr. O'Neal conducted long-term continuous ambient sound level measurement program for this 116 MW natural gas- and oil-fired simple cycle electric power generation facility. Acoustical modeling, including several rounds of mitigation, was performed to demonstrate compliance with the state noise policy.

- *Advanced Power Services – Brockton Power, Brockton, MA.* Conducted a 168-hour continuous ambient sound level measurement program at multiple sites for a proposed 350 MW natural gas-fired combined cycle electric power generation facility. Acoustical modeling, including mitigation, was performed to demonstrate compliance with the state noise policy. Expert testimony on noise issues was presented to the EFSB.

Linear Siting and Transmission Projects

- *NSTAR 345 kV Transmission Reliability Project, Stoughton, Canton, Milton, Boston, MA.* Mr. O'Neal was responsible for the noise impact assessment for this 18-mile multi-circuit underground 345 kV

project. Construction noise impacts along the route and operational noise from substations in Hyde Park and South Boston were analyzed and expert testimony before the EFSB was provided.

♦ *Weaver's Cove Energy, Fall River, MA.* This project proposed a new liquefied natural gas (LNG) import terminal and natural gas pipeline to be located on the Taunton River. Mr. O'Neal managed the implementation of an extensive existing condition sound level measurement program including long-term continuous and short-term measurements. Expected future sound level impacts from operation of the LNG import terminal were calculated and community sound level impacts from associated dredging were also evaluated. The Federal Energy Regulatory Commission Resource Report 9 section on noise impacts was prepared.

Industrial/Commercial Projects

♦ *General Electric Company, Hudson River PCBs Superfund Site, Hudson River, NY.* Mr. O'Neal prepared the Noise Impact Assessment for dredging, processing, and construction activities associated with Phase 1 of the Final Design Report. Source-specific sound level measurements of key sources were made and sound level monitoring was done during Phase 1 dredging and processing of the sediment to determine compliance with the Quality of Life Performance Standards.

♦ *The Stop & Shop Supermarket Company, Freetown, MA.* Noise impacts from loading dock activity, truck traffic, and rooftop mechanical equipment were analyzed as part of the local approval process for a 1,500,000-square-foot regional distribution center. The results of the study were presented to the neighborhood in a series of meetings.

Sand & Gravel Operations, Asphalt Plant, and Rock Quarry Projects

♦ *Okemo Mountain Resort, Ludlow, VT.* A sound level impact analysis was performed for a proposed sand and gravel excavation site in Ludlow. Ambient background sound level measurements were collected around the site. Project-specific impacts of the excavation and haul equipment were used to model future sound levels from operation of gravel extraction. Expert testimony on noise impacts was presented before the Act 250 District Environmental Commission and the local review board.

♦ *Dalrymple Gravel & Contracting Co., Inc., Erwin, NY.* A sound level impact analysis was performed for a proposed sand and gravel excavation site in support of the New York State Department of Environmental Conservation Mined Land Reclamation Permit and SEQRA process. Mr. O'Neal measured ambient background sound level around the site and measured project-specific impacts of the excavation and haul equipment at an existing excavation site, which were used to calculate future sound level impacts. Expert testimony on noise impacts was presented before a New York State Administrative Law Judge.

♦ *Massachusetts Broken Stone Company, Berlin, MA.* Mr. O'Neal performed an ambient hydrogen sulfide (H_2S) and meteorological monitoring program at an existing hot mix asphalt plant. Continuous measurements were made of H_2S, wind speed, and wind direction to determine if the facility may be a source of odor in the area.

Transfer Station/Landfill Projects

♦ *Wood Recycling, Inc., Southbridge, MA.* Mr. O'Neal prepared an ambient air quality monitoring plan for the existing Southbridge Landfill as part of the landfill gas and odor management requirements. He received approval from the Massachusetts Department of Environmental Protection for the sampling locations and equipment specifications of three fixed H_2S monitoring systems and an on-site meteorological station. Dispersion modeling was used to specify the appropriate detection limits for the H_2S equipment.

EXPERT TESTIMONY EXPERIENCE

Expert witness before the Maine Board of Environmental Protection, on noise issues for the Juniper Ridge Landfill expansion, Old Town, ME (2016).

Expert witness before the Board of Commissioners, Chowan and Perquimans Counties, NC, on blade and ice drop for Timbermill Wind Conditional Use Permit (2016).

Expert witness before the Environmental Review Tribunal (via skype), Ontario, Canada on noise issues for wpd White Pines Wind, Prince Edward County, Ontario [Case ERT 15-071, Alliance to Protect Prince Edward Co. v. Director, Ministry of the Environment] (2015).

Expert witness before the Jackson Township Board of Supervisors, Cambria County, PA on noise issues for a 980 MW natural gas-fired combined-cycle power generation plant (2015).

Expert witness before the Environmental Review Tribunal, Ontario, Canada on noise issues for Grey Highlands Clean Energy GP Corp., Grey Highlands, Ontario [Case ERT 15-026, Fohr v. Director, Ministry of the Environment] (2015).

Expert witness in Vermont Superior Court, Environmental Division, on noise issues for an aggregate extraction and crushing operation, McCullough Crushing, Calais, VT (2015).

Expert witness before the Environmental Review Tribunal, Ontario, Canada on noise issues for Grey Highlands Zero Emission People Wind Farm, Grey Highlands, Ontario [Case ERT 15-011, Dingeldein v. Director, Ministry of the Environment] (2015).

Prepared witness statement for the Environmental Review Tribunal, Ontario, Canada on noise issues for Niagara Region Wind Corporation, Haldimand County, Ontario [Case ERT 14-096, Mothers Against Wind Turbines, Inc. v. Director, Ministry of the Environment] (2015).

Expert witness before the Environmental Review Tribunal, Ontario, Canada on noise issues for SP Armow Wind Ontario GP Inc., Kincardine, Ontario [Case ERT 13-124 to 13-125, Kroeplin v. Director, Ministry of the Environment] (2014).

Expert witness before the Environmental Review Tribunal, Ontario, Canada on noise issues for K2 Wind Ontario, Inc., Ashfield-Colbourne-Wawanosh, Ontario [Case ERT 13-097 to 13-098, Drennan v. Director, Ministry of the Environment] (2013).

Expert witness before the Environmental Review Tribunal, Ontario, Canada on noise issues for Dufferin Wind Power, Melancthon, Ontario [Case ERT 13-070 to 13-075, Bovaird v. Director, Ministry of the Environment] (2013).

Expert witness before the NH Site Evaluation Committee on noise issues for the 30 MW Antrim Wind Project (2012; 2016); 48 MW Groton Wind project (2010).

Expert witness before the MA Energy Facilities Siting Board on noise issues for: 18-mile underground electric transmission line and substation project in the Boston Metropolitan area (2004-2005); Billerica Energy Center power plant (2007); Brockton Clean Energy (2008-2009), West Medway II power plant (2015), Woburn-Wakefield electric transmission line (2016).

Expert witness in Vermont Act 250 Land Use proceedings on noise issues for a proposed sand and gravel excavation site at Okemo Mountain (2007).

Expert witness in the 42nd District Court of Texas on noise issues for a 735 MW wind turbine farm (2006).

Expert witness before NY DEC Administrative Law Judge on noise issues for a hard rock quarry facility (1997), two sand and gravel excavation sites (2001; 2003), and a cogeneration power plant (2003).

Expert witness for site assignment hearings on noise issues from solid waste transfer stations in Lowell, MA (1998); Marshfield, MA (1999); Holliston, MA (2004); Oxford, MA (2006).

Expert witness in Massachusetts Land Court on noise issues for a proposed sand and gravel pit (1991), a proposed cross-dock distribution center (2002), and an existing concrete batch plant (2005).

Expert witness in Vermont Act 250 Land Use process for air quality impacts at ski areas (1991; 1992; 1997).

Expert witness before MA DEP Administrative Law Judge for an asphalt plant in Boston (1996).

Expert witness before municipal boards on issues of air pollution and noise impacts from local industries (many years).

Invited specialty speaker on noise impact assessments for Boston University's Masters of Urban Planning degree program (1994; 1996).

Publications

O'Neal, R.D., Hellweg, Jr., R.D. and R. M. Lampeter, 2011. Low frequency sound and infrasound from wind turbines. Noise Control Engineering Journal, 59 (2), 135-157.

O'Neal, R.D., and R.M. Lampeter, 2007: Sound Defense for a Wind Turbine Farm. North American Windpower, Zackin Publications, Volume 4, Number 4, May 2007.

O'Neal, R.D., 1991: Predicting potential sound levels: A case study in an urban area. Journal of the Air & Waste Management Association, 41, 1355-1359.

McKee, T.B. and R.D. O'Neal, 1989: The role of valley geometry and energy budget in the formation of nocturnal valley winds. Journal of Applied Meteorology, 28, 445-456.

Conference Presentations

Kaliski, K., O'Neal, R.D., et al 2016. Massachusetts Research Study on Wind Turbine Acoustics: Over view and Conclusions. NOISE-CON 2016, Providence, RI.

O'Neal, R.D., 2014. Wind Energy Sound Monitoring Under High Wind Shear Conditions. NOISE-CON 2014, Fort Lauderdale, FL.

O'Neal, R.D. Lampeter, R.M., Emil, C.B. and B.A. Gallant. Evaluating and controlling noise from a metal shredder system. Presented at INTER-NOISE 2012, NY, NY, August 19-22, 2012.

O'Neal, R.D., 2011. Wind Turbine sound Levels: The Michigan I, Huron County, MI Study. Presented at Great Lakes Wind Collaborative 4th Annual Meeting, Ypsilanti, MI.

O'Neal, R.D., Hellweg, Jr., R.D. and R. M. Lampeter, 2011. Low frequency sound and infrasound from wind turbines. Presented at WINDPOWER 2011, Anaheim, CA.

O'Neal, R.D., Hellweg, Jr., R.D. and R. M. Lampeter, 2010. Low frequency sound and infrasound from wind turbines – a status update. NOISE-CON 2010, Baltimore, MD.

O'Neal, R.D., 2010. Noise control evaluation for a concrete batch plant. NOISE-CON 2010, Baltimore, MD.

O'Neal, R.D., and R.M. Lampeter, 2009: Nuisance noise and the defense of a wind farm. INTER-NOISE 2009, Ottawa, Canada, August 23-26, 2009.

O'Neal, R.D., and R.M. Lampeter, 2009: Sound from Wind Turbines: A Key Factor in Siting a Wind Farm. 12th Annual Energy & Environment Conference – EUEC 2009, Phoenix, AZ, February 2, 2009.

O'Neal, R.D., 2001: The Impact of Ambient Sound Level Measurements on Power Plant Noise Control in Massachusetts: A Case Study. Proceedings of the Air & Waste Management Association 94th Annual Meeting and Exhibition, Orlando, FL, June 24-28.

Hendrick, E.M., and R.D. O'Neal, 2001: A Case Study of Class I Impacts Using CALPUFF Screen. Proceedings of the Air & Waste Management Association Guideline On Air Quality Models: A New Beginning, Newport, RI, April 2001.

O'Neal, R.D., 1994: Indoor air sampling techniques used to meet workplace and ambient air toxic detection requirements. Proceedings of the Air & Waste Management Association 87th Annual Meeting and Exhibition, Cincinnati, OH, June 19-24.

O'Neal, R.D., 1992: Estimating future noise levels from industrial noise sources. Acoustical Society of America 124th Meeting, New Orleans, LA, October 31 - November 4.

O'Neal, R.D., 1991: Temporal traffic fluctuations and their impact on modeled peak eight-hour carbon monoxide concentrations. Proceedings of the Air & Waste Management Association 84th Annual Meeting and Exhibition, Vancouver, B.C., June 16-21.

O'Neal, R.D., 1990: Noise barrier insertion loss: A case study in an urban area. Proceedings of the Air & Waste Management Association 83rd Annual Meeting and Exhibition, Pittsburgh, PA, June 24-29.

STATE OF NEW YORK
PUBLIC SERVICE COMMISSION

Application of Galloo Island Wind Transmission Facility for a Certificate under Article VII of the Public Service Law

Case No. 18-T-0015

PRE-FILED TESTIMONY OF:

ESTES PARKER, P.E.

PRINCIPAL ENGINEER

MAIN LINE ENERGY CONSULTANTS

Q: Please state your name, employer, and business address.

A: Estes Parker, P.E., Main Line Energy Consultants, LLC (Main Line), 1240 South Broad Street, Suite 100, Lansdale, PA 19446.

Q: What is your position at Main Line?

A: Principal Engineer.

Q: How long have you been employed with Main Line?

A: I have been employed with Main Line since 2011.

Q: Please describe your educational background and professional experience.

A: I have a Bachelor of Science in Mechanical Engineering from Western Michigan University. I have approximately 11 years' experience in energy transmission and distribution projects for voltage levels from 13 kV to 500 kV, involving substation, overhead and underground transmission lines. Please see attached for my curriculum vitae.

Q: Please describe your current responsibilities with Main Line.

A: I am responsible for managing a group of project engineers in the design and upgrade of transmission line projects, including reviewing and approving design and calculation procedures and processes and structural analysis, design and review.

Q: Have you previously testified before the New York State Public Service Commission or Siting Board on Electric Generation?

A: No.

Q: Have you previously served as an expert witness before any other court, agency, or other body on the subject you plan to offer testimony on today?

A: No.

Q: What is the purpose and scope of your testimony in this proceeding?

A: To sponsor certain portions of the Galloo Island Wind Transmission Facility Application or the Exhibits thereto.

Q: What portion(s) of the Application is your testimony sponsoring?

A: Exhibits 4.12 and E-5 (discussion in second paragraph relating to submarine cable).

Q: Were these Exhibits, Application sections, or studies prepared by you or under your direction and supervision?

A: Yes.

Q: In your testimony, will you refer to, or otherwise rely upon, any studies, publications, data or documents produced by persons other than yourself/your company? If so, please cite these sources. [These are independent studies, etc.]

A: Yes, appendices referenced in the section of the Application that I am sponsoring as set forth above.

Q: Does this conclude your testimony?

A: Yes.

ESTES PARKER, PE

Mr. Estes Parker, PE is a principal licensed engineer with expertise in a variety of Transmission and Distribution projects for voltage levels from 13kV to 500kV, involving substation, over-head and underground transmission lines. Responsible for developing and directing engineering design teams as well as leading individual projects. Design obligations include the analysis, design and re-habilitation of overhead transmission lines. Thorough understanding of detailed engineering design as well as a field work, constructability, and quality operational improvement. Mr. Parker has experience with siting and permitting of Transmission and Distribution facilities including representing the client in front of regulatory and public agencies. Has modeled, analyzed, and designed over 3,000 miles of PLS-CADD transmission circuits, including Lattice towers, monopoles and h-frame structures.

SECTORS OF EXPERTISE

Power
- Power Transmission and Distribution

Oil & Gas
- Automation & Controls

EDUCATION

B.S. Mechanical Engineering, Western Michigan University, Kalamazoo, MI, United States

EXPERIENCE HIGHLIGHTS

SINCE 2011

MAIN LINE ENERGY CONSULTANTS, LLC, LANSDALE, PA, UNITED STATES

Power Transmission & Distribution

Principal Engineer

- Lead, mentor and manage a group of project engineers in the design and upgrade of transmission line projects.
- Review and approve design and calculation procedures and processes
- Structural analysis, design, and review for steel, wood, aluminum, and concrete structures
- Direct project leadership on mid-Atlantic and northeast projects.
- Support commercial operations for T&D business sector.

Sieg-Quar 138kV Transmission Line, PPL Corp, Allentown, PA, United States, (02/2014-04/2015)

The project involved engineering, and construction management of a double circuit rebuild of 12 miles of 138KV transmission line. Creation of demolition plan for existing 69kV lattice towers. Design of new double circuit custom monopoles. Access design for existing right of way. Siting and environmental review and support for re-using existing structure locations. Design of new conductor sags, damper installation, foundations, and material selection.

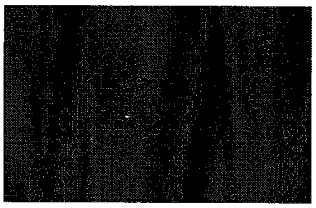
Years of Experience
- 11 years

Key Positions
- Engineering Manager
- Principal Engineer
- Project Manager

Languages
- English

Professional License
- Pennsylvania
- Maryland
- Indiana
- Minnesota
- New York
- Ohio
- Maine

ESTES PARKER, PE



Headwaters 345kV Transmission Line, EDPR/AEP, Randolph, IN, United States, (12/2013-07/2014)

The project involved engineering of a new single circuit 11 miles of 345KV transmission line. Design review of route and site selection. Design engineer for custom monopoles, sag calculation, hardware selection, and OPGW design. Preparation of migratory bird protection design. Preparation and review of EMF study. Final review of all transmission design construction deliverables.

Lidar Acquisition and P&P Preparation, NYPA, New York, United States (05/2015 - 10/2015)

Performed QA review of PLS-CADD models prepared for NYPA's 765kv system. Functioned as owner's engineer for Geodigital. Prepared and PE sealed new plan & profile drawings for use as ratings and clearance studies.

Cox's Corner to Lumberton 230kV, PSEG, Plainfield, New Jersey, United States, (04/2013 - 11/2014)

The Lumberton 230kV project focused on installing a new 230kV circuit from the Cox's Corner Substation to the Lumberton Substation, a distance of 4.3 miles. The intent of the design was to increase the circuit's capability of carrying a planned load increase while improving the lines performance under a 4-hour emergency load.

Knowledge of lattice tower designs and member connections allowed for a robust design and substantial amount of effort was placed on developing an appropriate construction sequence as well as an engineering design to ultimately provide a safe and cost effective solution. The final design involved fabricating an additional set of tower arms to support the second circuit as well as reinforcing substantial portions of the towers. Complete design of reinforcing schedule and new line installation package.

Northwest Deer Park 115kV Transmission Line, BGE, Baltimore, MD, United States, (2011-2012)

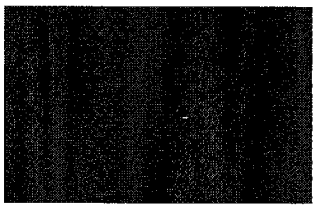
Project responsibilities included leading a project team to design a complete 115kV transmission line on an existing 500kV right-of-way. Project included the design of 15 miles of new transmission line utilizing single circuit steel poles. Project involved spanning two separate 1500 ft. water crossings, and navigating wetland classified areas. Conducted coordination of environmental mapping, permitting, community outreach, and public hearings for Public Service Commission. Performed detailed EMF and audible noise studies. Full design including structure spotting, stringing charts, and a complete structural analysis package with PLS-Cadd and LiDar survey.

Site Experience

- United States
- Kenya

Computer Applications

- PLS-CADD
- PLS-TOWER
- PLS-POLE
- Allen Bradley PLC
- Siemens PLC
- C++
- MathCAD
- AutoCAD
- STAADPro
- Labview
- Algor
- MS Project



PRE 2011

MSE POWER / CG POWER SOLUTIONS, COLLEGEVILLE, PA, UNITED STATES

Transmission Business Projects

Project Engineer

Moses Willis Double Circuit Contingency, NYPA, New York, United States, (2010)

Provided engineering and design for the analysis phase of the 230kV double circuit upgrade. Modeled lattice towers, performed line design, and EMF study. Evaluated layout and site requirements for geotech exploration and environmental permitting.

Perryman to Harford 115kV Transmission Line, BGE, Baltimore, MD, United States (2009)

The project involved engineering, and construction management of a single circuit 115KV transmission line.. Design of new custom monopoles. Access design for existing right of way. Siting and environmental review and support for permitting, including preparing support documentation for CPCN filing. for Design of new conductor sags, damper installation, foundations, and material selection.

69kV System Analysis and Mitigation, Central Hudson Gas & Electric, Poughkeepsie, NY, United States

- Modeled entire 69kV system in PLS-CADD
- Prepared clearance reports of NERC ratings audit.
- Designed mitigation solutions for all circuits analyzed.

System Rating Verification, BGE, Baltimore, MD, United States

- Conducted and managed a network wide internal system ratings verification and analysis to support NERC compliance.
- Project included hand analysis of existing documentation to verify system ratings, coordinating field verifications, and utilizing LiDar survey data to validate ratings.

500kV OPGW Addition, PSEG, Plainfield, New Jersey, United States

- Structural Analysis and modeling of 25 miles of lattice tower 500kV structures for the addition of fiber optic cable.
- Design of reinforcement for failing members
- Detailed fabrication drawings and construction sequencing for replacements and installation

PUBLIC APPOINTMENTS

2017-Current Planning Commissioner, City of Maple Grove, MN, United States

2010-2012 Planning Commissioner, Borough of Phoenixville, PA, United States

STATE OF NEW YORK
PUBLIC SERVICE COMMISSION

Application of Galloo Island Wind Transmission Facility for a Certificate under Article VII of the Public Service Law

Case No. 18-T-0015

PRE-FILED TESTIMONY OF:

GORDON PERKINS

SENIOR PROJECT MANAGER

ENVIRONMENTAL DESIGN & RESEARCH

LANDSCAPE ARCHITECTURE, ENGINEERING & ENVIRONMENTAL SERVICES, D.P.C.

Q: Please state your name, employer, and business address.

A: Gordon Perkins, GISP, Environmental Design & Research, Landscape Architecture, Engineering & Environmental Services, D.P.C. (EDR), 217 Montgomery Street, Suite 1000, Syracuse, New York 13202.

Q: What is your position at EDR?

A: Senior Project Manager.

Q: How long have you been employed with EDR?

A: I have been employed at EDR since July 2016. I previously worked for EDR from 2001 through 2008.

Q: Please describe your educational background and professional experience.

A: I have a Bachelor of Landscape Architecture with an emphasis in Ecology from the State University of New York College of Environmental Science and Forestry, and am a Certified Geographic Information Systems Professional (GISP). I have more than 16 years of professional experience focusing primarily on visualization and visual impact assessment, with extensive expertise in digital graphics and the use of 2-D and 3-D software applications to create visual simulations.

Q: Please describe your current responsibilities with EDR.

A: As a Senior Project Manager, I am responsible for conducting and/or overseeing visual impact assessments as well as for the ongoing evaluation and improvement of EDR's technical methodologies used in such assessments, including new techniques in data collection, processing and analysis and 3-D modeling. I am also responsible for assigning, scheduling and coordinating staff, overseeing project teams, and providing quality assurance.

Q: **Have you previously testified before the New York State Public Service Commission or Siting Board on Electric Generation?**

A: Yes. On three occasions.

Q: Have you previously served as an expert witness before any other court, agency, or other body on the subject you plan to offer testimony on today?

A: I have provided expert witness testimony before the Rhode Island Energy Facilities Siting Board (EFSB) and the Connecticut Siting Council.

Q: What is the purpose and scope of your testimony in this proceeding?

A: To sponsor certain portions of the Galloo Island Wind Transmission Facility Application or the Exhibits thereto.

Q: What portion(s) of the Application is your testimony sponsoring?

A: Exhibit 4.9.

Q: Were these Exhibits, Application sections, or studies prepared by you or under your direction and supervision?

A: Yes.

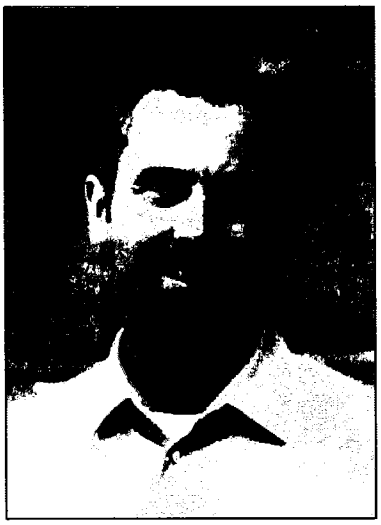
Q: In your testimony, will you refer to, or otherwise rely upon, any studies, publications, data or documents produced by persons other than yourself/your company? If so, please cite these sources. [These are independent studies, etc.]

A: Yes, appendices referenced in the section of the Application that I am sponsoring as set forth above.

Q: Does this conclude your testimony?

A: Yes.

Gordon Perkins, GISP
Senior Project Manager



Gordon Perkins is a Senior Project Manager with more than 15 years of professional experience. Gordon is one of the leading expert consultants in Visualization and Visual Impact Assessment in the Northeast. Gordon has extensive expertise in digital graphics and uses 2-D and 3-D software applications to create visual simulations and effectively communicate design concepts. He has completed many visual impact assessments and has provided expert witness testimony on several of those projects. Gordon has also conducted research regarding visibility distance thresholds, effects of earth curvature and refraction on visibility, and the nighttime impacts of FAA obstruction lighting.

As a Senior Project Manager with EDR, Gordon's responsibilities include the ongoing evaluation and improvement of our technical methodologies used in visual impact assessment, including new techniques in data collection, processing and analysis, and 3D modeling. Gordon is also responsible for assigning, scheduling and coordinating assistance from the in-house multi-disciplined team of professionals. He remains hands-on throughout the project, overseeing and advising the EDR Team as needed, as well as providing quality assurance.

education

State University of New York College of Environmental Science and Forestry, Syracuse, NY, *Bachelor of Landscape Architecture, Ecology Emphasis,* 2001.

Keystone College, La Plume, PA, *Associate of Arts,* 1998.

registration / certifications

Certified Geographic Information Systems Professional (GISP)

Federal Aviation Association, *Unmanned Aerial Vehicle (UAV) Pilot Certification for Commercial Flights*, Anticipated Nov. 2, 2016

professional affiliations

Member, American Wind Energy Association

Member, Alliance for Clean Energy New York

employment history

Senior Project Manager, Environmental Design & Research, Landscape Architecture, Engineering & Environmental Services, D.P.C., Syracuse, NY, 2016-Present.

Project Scientist – Visualization and GIS Specialist, ESS Group, Inc., East Providence, RI, 2011-2016

Senior Visual Analyst – Project Manager, Saratoga Associates Landscape Architects, Architects, Engineers, and Planners, P.C., Syracuse, NY, 2008-2011.

Project Manager and Visualization Specialist, Environmental Design & Research, Syracuse, NY, 2001-2008.

representative project experience

Bureau of Ocean Management Offshore Visualizations for the MA/RI WEA - *Prior to EDR,* created over 400 survey accurate visual simulations depicting the BOEM wind energy areas in Massachusetts and Rhode Island. Used digital imaging techniques to depict four seasons and four times of day from each viewpoint. Contracted survey and meteorological experts to produce accurate visibility models.

Interstate 81 (I-81) Viaduct Project, City of Syracuse, Onondaga County, NY – Managed Visual Impact Assessment conducted in accordance with Federal Highway Administration Visual Impact Assessment protocol as part of NEPA review as part of a consultant team for the replacement of approximately 5 miles of elevated highways.

Project Icebreaker, Erie County, Cleveland, OH – Managed Visual Impact Assessment for a proposed 20 megawatt offshore wind project.

Penn Forest Wind Project, Town of Penn Forest, Carbon County, PA – Prepared viewshed mapping, photography, and preliminary photo simulations for a proposed 40 turbine locations, permanent meteorological towers, overhead and underground collection and interconnect systems, a substation, and access roads.

Block Island Wind Farm, Block Island, RI – Prepared 28 daytime and nighttime simulations of the offshore turbines from viewpoints on Block Island and the mainland for a proposed 30 MW wind farm facility located in the Atlantic Ocean, 3 miles off the coast. On-shore facilities include electrical lines, switchyards, and substations.

Jamestown Board of Public Utilities Power Plant and Operations Center, Jamestown, NY - Prepared visual impact assessment for a 40 MW clean-coal power-generating plant and operations center. EDR performed an analysis of project visibility, including viewshed analysis and field verification. Visual impacts of the project were assessed by creating computer models of the proposed facilities and computer-assisted visual simulations of potential impacts as viewed from representative viewpoints. EDR-prepared report listed conclusions concerning potential visually sensitive receptors and identified mitigation options, which included recommendations regarding design and siting, the color and texture of built materials, and lighting.

University Avenue, Syracuse, NY – Created photo-renderings from conceptual plans that illustrated the proposed improvements to pedestrian and vehicular spaces. This project included recommendations and guidelines for street improvements along University Avenue, a main corridor onto the Syracuse University campus

NYS Route 3 Community Development Study, Black River, NY – Provided graphic and technical assistance in this highway corridor development guideline package. Assisted in creating a professional full length video and a 150 slide DVD presentation with 3-D animations and videography.

Bushkill Communications Tower, Town of Bushkill, PA – Conducted fieldwork and prepared viewshed maps and visual simulations to evaluate the visibility and visual impact of a proposed wireless communication facility. The focus of the evaluation was the potential impact of the proposed project on the Delaware Water Gap National Recreation Area. Analytical results were used by the project developer in negotiations with National Park Service.

NYS Route 3 Community Development Study, Jefferson County, NY – Provided graphic and technical assistance in this highway corridor development guideline package prepared for the Tug Hill Commission. Assisted in creating a professional, full-length video and a 150 slide DVD presentation with 3-D animations and videography

Maple Ridge Wind Farm, Lewis County, NY - Assisted in the completion of a visual analysis for a 320-megawatt wind farm project. Completed Field Verification (Balloon study), visual simulations, viewshed analysis, and nighttime impact assessment. Completed visual impact assessment for the associated 230 kV Transmission line (Article VII).

Southern Rhode Island Transmission Project, East Greenwich, RI - Completed photography and field verification for a 7.3-mile 115kV transmission line and associated substation. Created visual simulations representing realistic and accurate right-of-way clearing and proposed improvements. Provided expert witness testimony before the Rhode Island Energy Facilities Siting Board.

Tompkins County Public Safety Communications System, Tompkins County, NY – Developed viewshed maps and visual simulations for Visual Impact Assessment component of the Draft Environmental Impact Statement (DEIS) prepared for the siting of nine new towers for wireless communications.

Hamlet of Brewerton Revitalization Project, Onondaga County, NY - *Prior to EDR*, managed a multi million-dollar highway and park design improvement project. Provided expertise in state design guidelines and federal grant guidelines. Presented at major televised public outreach events.

Walden Pond Shoreline Erosion Assessment and Monitoring – *Prior to EDR*, designed a system by which MASS DCR can photographically document erosion rates and severity. Produced an interactive map package which allows the user to compare multiple years of erosion data and photographs. Provided field survey and documentation to demonstrate rate of erosion.

Winchester Country Club Course Expansion, Winchester, MA - *Prior to EDR*, developed designs, grading and permitting for a 15-acre golf course expansion. Provided expertise in invasive species management and wetland buffer enhancement. Performed cutfill calculations and watershed analysis.

STATE OF NEW YORK
PUBLIC SERVICE COMMISSION

Application of Galloo Island Wind Transmission Facility for a Certificate under Article VII of the Public Service Law

Case No. 18-T-0015

PRE-FILED TESTIMONY OF:

JANE E. RICE

DIRECTOR OF PLANNING

ENVIRONMENTAL DESIGN & RESEARCH

LANDSCAPE ARCHITECTURE, ENGINEERING & ENVIRONMENTAL SERVICES, D.P.C.

Q: Please state your name, employer, and business address.

A: Jane E. Rice, Environmental Design & Research, Landscape Architecture, Engineering & Environmental Services, D.P.C. (EDR), 217 Montgomery Street, Suite 1000, Syracuse, New York 13202.

Q: What is your position at EDR?

A: I am a Principal at EDR and Director of Planning.

Q: How long have you been employed with EDR?

A: I have been employed at EDR since August 2005.

Q: Please describe your educational background and professional experience.

A: I received a Bachelor of Arts Degree from Creighton University in Omaha, Nebraska in 1981 and a Juris Doctor from Creighton Law School in 1986. I practiced law with several private law firms until 1991 when I joined the master program at State University of New York College of Environmental Science and Forestry. I obtained a Masters in Landscape Architecture in 1995. I was employed by Clough Harbor and Associates until 2005 when I joined EDR. Since 1995 I have worked in the capacity as Planner, Project Manager, Senior Project Manager, and Director of the Planning practice. I have over 20 years of experience in community and land use planning, with 10 years of experience preparing and/or supervising projects involving socioeconomic reports for wind energy projects. A copy of my curriculum vitae is attached.

Q: Please describe your current responsibilities with EDR.

A: As Principal and Director of Planning, I oversee EDR's planning practice, which consists of various community-centered planning initiatives that include comprehensive plans, waterfront revitalization planning and design, brownfield redevelopment planning, developing downtown and neighborhood revitalization strategies, zoning and land use regulations, and agriculture and farmland protection

plans. A small portion of our planning work also includes coordinating or conducting socioeconomic analyses.

Q: **Have you previously testified before the New York State Public Service Commission or Siting Board on Electric Generation?**

A: Yes. I served as an expert witness before the New York Board on Electric Generation Siting and the Environment (Case No. 14-F-0490).

Q: Have you previously served as an expert witness before any other court, agency, or other body on the subject you plan to offer testimony on today?

A: No.

Q: What is the purpose and scope of your testimony in this proceeding?

A: To sponsor certain portions of the Galloo Island Wind Transmission Facility Application or the Exhibits thereto.

Q: What portion(s) of the Application is your testimony sponsoring?

A: Exhibit 6.

Q: Were these Exhibits, Application sections, or studies prepared by you or under your direction and supervision?

A: Yes.

Q: In your testimony, will you refer to, or otherwise rely upon, any studies, publications, data or documents produced by persons other than yourself/your company? If so, please cite these sources. [These are independent studies, etc.]

A: Yes, appendices referenced in the section of the Application that I am sponsoring as set forth above.

Q: Does this conclude your testimony?

A: Yes.

Jane E. Rice, JD, AICP, Principal
Director of Planning

Jane is the Director of Planning at EDR. She is a certified planner and a licensed attorney with more than 25 years of professional experience. Jane's expertise includes project management, community and land use planning, economic development, waterfront revitalization planning, smart growth management and analysis, zoning, stakeholder involvement and engagement. She is currently a member of the American Institute of Certified Planners, American Planning Association, New York State Bar Association, New York State Planning Federation Board of Directors, and Vice President of the Onondaga County Planning Federation Board of Directors. She has also served as Chairperson of the Village of Fayetteville Planning Board for more than 15 years. Jane is a sought-after lecturer in topics related to Environmental Integrity, Sustainable Land Use Planning & Design, Resource Conservation Strategies, Form Based Zoning, Community Character, and Community Engagement.

As the Director of Planning at EDR, Jane is responsible for assigning, scheduling and coordinating assistance from the in-house multi-disciplined team of professionals. She remains hands-on throughout the project, overseeing and advising the EDR Team as needed, as well as providing quality assurance. In all cases she vets her projects through a sustainability analysis to ensure solutions are economically, environmentally, and socially sustainable over time.

education

Master of Landscape Architecture: State University of New York College of Environmental Sciences and Forestry, Syracuse, NY, May 1996.

Juris Doctor: Creighton University School of Law, Omaha, Nebraska (Aug 1982 – Dec 1983), Albany Law School, Albany, NY (Jan 1984 – May 1985).

Bachelor of Arts in Political Science, Creighton University, Omaha, NE, May 1981.

professional affiliations

Vice President, Onondaga County Planning Federation Board

Chairperson, Fayetteville Planning Board

Member, New York State Bar Association

Member, Board of Directors, New York State Planning Federation

Member, American Planning Association

registration / certifications

American Institute of Certified Planners (AICP)

Juris Doctor

employment history

Principal, Director of Planning, Senior Planner, Environmental Design & Research, Landscape Architecture and Engineering and Environmental Resources, D.P.C, August 2005 – present.

Community Planner, Independent Consultant, 2004 – 2005.

Community Planner, Clough Harbour & Associates LLP, Syracuse, NY, 1997 – 2004.

Attorney at Law, Independent Consultant, 1991 – 1994.

Attorney at Law, Scolaro Law Firm, 1987 – 1991.

wind project experience

Copenhagen Wind Farm – Lewis County, NY – Oversaw the preparation of Socioeconomic section in the Environmental Impact Statement (EIS). Project is currently under construction, and was reviewed and approved through preparation of EISs in accordance with the State Environmental Quality Review Act (SEQRA), while also receiving approval from the New York State Department of Environmental Conservation (NYSDEC) under Article 15 and 24 of the Environmental Conservation Law (ECL);

Allegany Wind Power Project – Cattaraugus County, NY – Oversaw the preparation of a standalone Socioeconomic Report as an appendix to the EIS. Project was reviewed and approved in accordance with the State Environmental Quality Review Act (SEQRA), and fully aligned with all necessary permits.

Icebreaker Offshore Wind Farm – Cuyahoga County, OH – Oversaw the preparation of full standalone Socioeconomic Report as a component of the Application for Certificates of Environmental Compatibility and Public Need (Certificate Application). Project is currently in the process of review from the Ohio Public Service Board.

Scioto Ridge Wind Farm – Hardin and Logan Counties, OH – Oversaw the preparation of full standalone Socioeconomic Report as a component of the Application for Certificates of Environmental Compatibility and Public Need (Certificate Application).

Crown City Wind Energy Project – Cortland County, NY – Oversaw the preparation of a standalone Socioeconomic Report as an appendix to the EIS. Project was reviewed in accordance with the State Environmental Quality Review Act (SEQRA).

other project experience

Onondaga Lake – Town of Geddes Lakeshore Enhancement Project, Onondaga County, NY – Directed team that created site plans and designs, and conducted extensive community outreach and engagement activities, for adaptive reuse and ecological restoration of the 4,000 acres of the former Allied Corporation property (now owned by Honeywell Corporation). The purpose of this project is to remediate and reuse the Super Fund site in a more environmentally sensitive manner.

Syracuse Metropolitan Transportation Authority, Transit Study Phase 1 (SMART 1) on behalf of the CNY Regional Transportation Authority, Syracuse, NY – Directed team providing community planning services, that include outreach and engagement activities to a team of national consultant to advance recommendations identified in the Syracuse Transit Analysis to pursue a higher-intensity transit services along the Destiny/Regional Transportation Center to Syracuse University and James Street/South Avenue corridors.

NYSDOS / Town & Village of Clayton - Local Waterfront Revitalization Program (LWRP), Jefferson County, NY – Directed team that developed the LWRP, conducted extensive community outreach and engagement activities, evaluated site and designed segments of the new RiverWalk waterfront connection and access to the St. Lawrence River.

NYSDOT / The Riverwalk, Village of Clayton, (Phase 2 – NYSDOS / Phase 3 – NYSDOT / LAFA Region 3) Jefferson County, NY – Directed site planning and design services, that include community outreach and engagement activities in support of Phase 2 of the Riverwalk Project. Currently responsible for coordinating design of best options to support Phase 3 implementation.

NYSDOS / City of Syracuse - Hiawatha Boulevard-Lodi Street Brownfield Opportunity Area Program (BOA), Syracuse, NY – Directed team (with Sasaki Associates) that developed a Nomination Study that incorporates a 136-acre area with 11 potential brownfield properties. This is a main artery to a vital, heavily traveled section of Syracuse. It is also an area that is suffering from depressed commercial properties and deteriorating housing stock, both of which are intermixed with active businesses. Managed team that developed the BOA, conducted extensive community outreach and engagement activities, evaluated site and designed visionary outcomes for this a low income neighborhood.

NYSDOS / City of Ogdensburg - Local Waterfront Revitalization Program (LWRP), St. Lawrence County, NY – Directed team that developed an amendment to the LWRP, conducted extensive community outreach and engagement activities, designed conceptual land use patterns, and assisted the City in identifying policies and procedures that will implement the LWRP through a series of priority projects for the purpose of improving waterfront connections and economic development opportunities.

NYSDOS / Town of Alexandra & Village of Alexandria Bay - Local Waterfront Revitalization Program (LWRP), Jefferson County, NY – Directed team that identified and designed visionary outcomes for revitalization of the St. Lawrence River waterfront. Assisted in identifying opportunities for waterfront use and development, and to adopt appropriate policies and implementation strategies. Ongoing development projects include improvement to the existing Scenic View Park and creation of a new river walk along the River. Conducted extensive community outreach and engagement activities.

NYSDOT / Syracuse I-81 Viaduct – Step 2 Scoping & Preliminary Design Project, Syracuse, NY – Currently responsible for coordinating extensive community outreach and engagement activities as a member of the Parsons Team to determine design of best options for redevelopment of this major transportation hub project located close to Downtown and University Hill area.

NYSDOS / Village of Sackets Harbor - Local Waterfront Revitalization Program (LWRP), Jefferson County, NY – Directed team that developed the LWRP, conducted extensive community outreach and engagement activities, evaluated site and designed visionary outcomes. This effort included analyzing opportunities and constraints in the Village, establishing a framework of policies to protect and enhance the resources of the Village and connections to the St. Lawrence River, and by developing proposals to capitalize on the opportunities of the waterfront within the context of established policies.

NYSDOT / NYSOPRHP - Niagara Falls Robert Moses Parkway Removal – Step 2 Scoping & Preliminary Design Project, Niagara Falls, NY - Directed extensive community outreach and engagement activities, and landscape design to determine and depict best options, for redevelopment of the northern section of this major transportation corridor project.

NYSDOT / City of Rochester, East Main Street Marketing District Plan, Rochester, NY (LAFA Region 4) – Directed site planning services, that include community outreach and engagement services, to a team of national and local consultants to identify multi-modal circulation, access and parking improvements along with recommendations for land use development, streetscape enhancements, and community branding, as well as strategies to promote housing opportunities in the area.

Niagara Gorge RIM Ecological Restoration Plan (Robert Moses Parkway Removal Study), City of Niagara Falls, NY – Directed team that quantified economic, environmental, and social costs and benefits of roadway removal and natural resource restoration proposal, and that analyzed various potential impacts including traffic distribution, active transportation, buffering, naturalization, environmental quality, and local economic development opportunities. *American Society of Landscape Architects Merit Award for Planning*

Agricultural Enhancement Plans, Tioga, Broome and Ontario County, NY – Directed public participation and outreach activities, researching countywide agricultural land uses, and agricultural economic concerns, advising county on analysis of priority lands to be protected, and drafting recommendations to drive sustainable growth consistent with industry and environmental best practices, and NYSDAM guidelines.

New York Rising Community Reconstruction Plan, Herkimer, Madison, & Oneida County, NY – Directed the New York Rising Community Reconstruction Program that was established by the New York State Department of State in the wake of several severe weather events including Hurricanes Sandy and Irene, Tropical Storm Lee, and the devastating floods of 2013. The program leverages state investments to assist with reconstruction projects directed toward damaged infrastructure, as well as other projects that are intended to mitigate against future risks and increase their resiliency in the face of future storm events. As a member of the consulting team EDR assisted with community outreach throughout Madison, Oneida, and Herkimer Counties, where back-to-back storms flooded entire communities twice within three days – washing out roads, bridges, utilities, and other infrastructure. The New York Rising Countywide Resiliency Plan (for each county) represents the first steps that the county and state will take toward implementing priority projects, and ultimately creating a more resilient Madison, Oneida, and Herkimer County.

Robert Moses Parkway North Segment Step 2 Scoping & Preliminary Design Project, Niagara Falls, NY – Directed the restoration of the Niagara Gorge Rim along the upper Niagara River will be transformative for the City of Niagara Falls. A one-mile stretch of the 50-year old, four-lane Robert Moses Parkway from Main Street in the City of Niagara Falls to its intersection with Findlay Drive will be removed to allow for a re-greening of the park with multi-use trails, improved scenic overlooks, and other park amenities. Whirlpool Street will be improved as a complete street reconnecting the neighborhoods to the park. As one of the subconsultants on the consulting team EDR worked on developing three alternative concepts from which the preferred concept was selected, as well as simulations to illustrate the proposed gateways, streetscape improvements, and other scenic overlooks. We participated in community outreach, engaging the community throughout the process, and provided an assessment of potential impacts on ecological resources, including threatened and endangered species.

Hiawatha Boulevard-Lodi Street Brownfield Opportunity Area Program, City of Syracuse, NY – Directed the team that served as the Lead Consultant in association with Sasaki Associates t o create a Nomination Study for the Hiawatha Boulevard/Lodi Street Brownfield Opportunity Area within the City of Syracuse. This BOA incorporates a 136-acre area with approximately 11 potential brownfield properties. The area is a main artery to a vital, heavily traveled section of Syracuse. It is also an area that is suffering from depressed commercial properties and deteriorating housing stock, both of which are intermixed with active businesses. This BOA presents strategic opportunities to stimulate economic development and community revitalization. It is in close proximity to the Carousel Center, a regional retail mall which has recently expanded, and that attracts millions of visitors each year, providing a critical mass of people and vehicles passing through the Hiawatha Boulevard corridor. The project area also serves as a major transportation route to access the Alliance Bank Stadium, the home field of the Chiefs, which averages half a million ticket sales per year. It is also situated adjacent to the Central New York Regional Market, which houses hundreds of stands and attracts more than a million visitors annually, as well as the Regional Transportation Center. As a result, this BOA provides a significant opportunity for the successful redevelopment of vacant, underutilized and blighted properties located in an area with very high visibility. (2011-2013)

Girl Scouts Feasibility Study and Master Plan, Tomkins County, Ithaca, NY – Directed a campus and facilities master plan as developed for all 65 acres of Camp Comstock. This master planning process included, site visits, stakeholder meetings, research on local development regulations, and historic and cultural resources relevant to the camp. The effort included improvements to existing facilities as well as new facilities and uses intended to generate new and sustainable revenues for the Girl Scouts. While developing the master plan we continuously discussed operational and programming issues / needs / preferences so that all aspects are aligned with the recommendations for future improvements and new development. The final Master Plan Report includes the initial feasibility study for all four Girl Scout Camps, the recommendation to initially invest in Camp Comstock for facility improvements as well program development, and the Master Plan with planning and design details on connectivity throughout the main camp, facility improvements, new development and minor but critically important amenities.

Plan for Reconnecting the Erie Canal Gateway, Town of DeWitt, Onondaga County, NY - Directed the EDR team that was collaborating with the town of DeWitt to prepare a plan for the revitalization of the waterfront along the NYS Canal System. The plan is proposed to include: visioning for the historic canal corridor, assessment of development patterns, identification of land and water use controls, and development of revitalization policies and implementation strategies. Work will include planning for a segment of the canal way trail that would close the gap between the Town of Dewitt and the Town of Camillus.

Agricultural and Farmland Protection Plan, Ontario County, NY – Directed the EDR team that was collaborating with Ontario County in the development of their Enhancement Plan. EDR is designing and facilitating a community outreach plan with the goal of engaging local farmers, agricultural producers, and stakeholders in the local agricultural business, and facilitated several focus group meetings. With the community's direct input, and through targeted analysis, we will make recommendations that touch upon local land use regulations, regional policies in support of agricultural producers and businesses, marketing, economic development, and implementation procedures for the Agricultural Enhancement Plan.

Skunk City Neighborhood Master Plan, Syracuse, NY – Directed the EDR team that worked in collaboration with staff from the Department of Neighborhood and Business Development and neighborhood advocates, which drafted the Skunk City Neighborhood Master Plan for the City of Syracuse in 2012. Located on the city's west side, between Strathmore, Tipp Hill, and the Near Westside, Skunk City is a neighborhood where relatively modest public investments could have an outsized impact on residents' quality of life. Our work within the neighborhood sought to increase neighborhood safety, stabilize property values, encourage new investment, reutilize abandoned properties, and improve pedestrian connectivity within and around the neighborhood. The principal intent of the Skunk City Neighborhood Master Plan is to make strategic and incremental improvements where such actions could have a positive influence on the environmental, economic, and social fabric of the community.

Sackets Harbor Zoning, Sackets Harbor, Jefferson County, NY – Directed the EDR team that was retained along with Joel Russell, Esq. to assist the Village of Sackets Harbor in rewriting their zoning regulations to foster the village's growth with a sensitivity towards its cultural resources and its traditional village core and rural edge. EDR completed a community buildout visualization to assist villagers envision its future growth under the then-existing zoning regulations. The potential loss of natural and cultural resources prompted the village to undertake the development of a new hybrid zoning code that applies a form-based structure. The new zoning law provides development regulations that address site layout, architectural treatments, and landscape standards that preserve the natural resources within the community. The new zoning law utilizes graphics and tables to provide clarity and improve readability.

Carrier Dome Rainwater Harvesting, Syracuse, NY – Directed the EDR team that designed and developed interpretive materials. In the spirit of the Onondaga County Save the Rain program and with the goal of increasing its sustainable practices, Syracuse University embraced the concept of capturing and using the rainwater that falls on the roof of the Carrier Dome. With the Rainwater Harvesting System enough water is captured to flush half the Dome's toilets and urinals during major Dome events. The Rain Water Harvesting System consists of two exterior 25,000-gallon storage tanks, and two interior 4,500 gallon tanks that will hold rainwater captured from approximately one third of the Carrier Dome's roof. Teamed with a local engineering firm, and two Syracuse University graphic design students, EDR facilitated several design workshops with students and faculty to design, select, and develop a logo for the Carrier Dome Rain Harvesting System as well as wall murals and a 3D model/video. EDR facilitated the design of interior interpretive wall murals, exterior signage, and an interpretive video about the rainwater harvesting process as well benefits derived from using such a system.

Oswego Brownfield Opportunity Area Program, Oswego County, NY – Directed the team that provided planning and design services to identify what is needed to achieve a coherent and integrated urban development program that preserves and protects the best of what exists, and incorporates new development in a compatible manner. The design will build on existing infrastructure, incorporate existing historic fabric where appropriate, and identify appropriate patterns and forms for new development. EDR has also been charged with identifying what is necessary to create a memorable place through development of an urban design concept that incorporates a clear organization of sites, streets and open space. (2010-2012)

Finger Lakes Sustainability Plan – Directed the team charged with development of indicators of sustainability in the agricultural and forestry sectors of a 9-county region in Western New York. Facilitated outreach initiatives and analyzed strategies and targets for sustainable development.

Comprehensive Plan Update, Town of Canandaigua, NY – Directed the team that researched existing conditions, and analyzed economic and demographic changes over time. Worked with local advisory committee to craft goals and recommended actions for plan implementation. Managed team that development of Natural Resources Inventory for examination of development proposals by local Environmental Conservation Board.

Zoning Amendments – Directed the team that researched local land use patterns and development trends, and identification of options for land protection and development strategies. Worked with Town staff and board members to shape improve existing conservation subdivision ordinance

Niagara Falls Underground Railroad Heritage Area Management Plan (HAMP), City of Niagara Falls, NY – Directed the team that researched existing economic and demographic conditions within Niagara County. Managed team that researched history of Underground Railroad that helped shape management strategies. The HAMP was authorized under Section 35.05 of the New York State Parks, Recreation, and Historic Preservation Law to identify and encourage heritage tourism opportunities related to Underground Railroad in the vicinity of Niagara Falls District.

Syracuse Metropolitan Transportation Council & Town of Clay, NY – Three Rivers Point Waterfront Access Study – Directed the team that provided planning and design services to determine best use for 75 acres of prime waterfront land located at the intersection of the Oswego, Seneca and Oneida Rivers. The property is an abandoned oil transfer station. In Phase 1, a conceptual master plan was developed to depict a mixed-use development. The plan also recommended public space and access to the water, along with a sensitive approach to the historic and cultural values of the Town and the site. As a result, the Town received funding to mitigate the Brownfield and demolish deteriorated buildings to make the site more attractive to investment.

Agricultural and Farmland Protection Plan, Tioga County, NY – Directed the EDR team that collaborated with Tioga County in the development of their Agriculture and Farmland Protection Plan. We designed and facilitated a community outreach plan with the goal of engaging local farmers, agricultural producers, and stakeholders in the local agricultural business. EDR developed, facilitated, and analyzed a SWOT (Strengths, Weaknesses, Opportunities, and Threats) exercise with farmers throughout the county, focusing on alternative energy opportunities, commerce and marketing, and public policy. With the community's direct input, and through targeted analysis, our findings and recommendations touched upon local land use regulations, regional policies in support of agricultural producers and businesses, marketing, economic development, and implementation procedures for the Agricultural and Farmland Protection Plan.

publications / presentations

Presenter, Onondaga County Planning Federation, McIntyre Commons: A Case Study in Brownfield Redevelopment, Community Character, and Environmental Integrity, March 5, 2015

Presenter, Onondaga County Planning Federation, Form-Based Zoning: A Creative Approach, March 13, 2014

Presenter, Onondaga County Planning Federation, Sustainable Land Use Planning & Resource Conservation Strategies, March 14, 2013

Panelist, GreeningUSA Green Bag Lunch Series, Sustainable Land Use Planning & Resource Conservation Strategies, 2013.

Presenter, Sustainable Community Planning, APA/ASLA Upstate NY Chapters Joint-Conference, Utica NY, September 2011.

Presenter, Land Use Planning Workshop, The Benefits of Sustainable Community Planning & Design, Jefferson Community College Center for Community Studies, 2011.

Land Use Training Workshop for Herkimer-Oneida Counties, Herkimer-Oneida Counties Comprehensive Planning Program, 2010.

Land Use Planning Workshop for Jefferson County, 2009.

Annual Planning Symposium for the Onondaga County Planning Federation, Syracuse, NY, 2008 and 2009.