

**SECTION 4**

**Technical Ability**

## Section 4. Technical Ability

### A. Narrative.

The applicant has secured an extensive team for the design, development and construction of the proposed project. In addition to the staff of SWEB Development USA, LLC, the following third-party consultants will be a part of the project team:

**Exhibit 4.1. CES INC** – Civil Engineering, Surveying, Environmental Services, Wildlife Services, Construction Inspection

**Exhibit 4.2. RSG** – Noise Assessment

**Exhibit 4.3. RLC Engineering** – Electrical Engineering

**Exhibit 4.4. CIANBRO Corp.** – Construction

**Exhibit 4.5. Strum Engineering** – Flicker Report and Visual Impact

Qualifications for the above noted professionals are attached.

# **2019 QUALIFICATIONS**

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Contact:

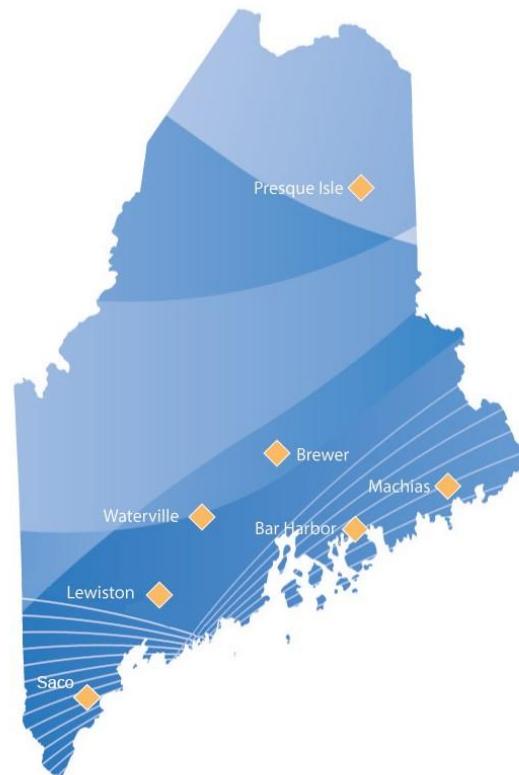
Tim Brochu, PLS  
Senior Vice President  
465 South Main Street  
Brewer, ME 04412  
[tbrochu@cesincusa.com](mailto:tbrochu@cesincusa.com)  
P. 207-989-4824

## **COMPANY PROFILE AND CAPABILITIES**

**CES, Inc.** was founded in 1978 as a civil engineering firm and has grown into a professional, multi- disciplined, consulting company that offers a wide range of services from project conception to final construction. Over 100 highly qualified personnel including Engineers, Land Surveyors, Geologists, Environmental Scientists, Foresters, GIS Analysts and CADD Technicians make up the professional diversity within one company to tackle a variety of projects. Integrating their technical skills and expertise, they are able to provide **sensible solutions** to municipal, industrial, commercial, and institutional clients throughout New England.

CES is headquartered in Brewer, Maine, with branch offices located in the communities of Bar Harbor, Lewiston, Machias, Presque Isle, Waterville and Saco. We have recently added a new branch in Fort Myers, Florida. Our services include:

- ◆ Civil Engineering
- ◆ Environmental Engineering
- ◆ Electrical Engineering
- ◆ Structural Engineering
- ◆ Mechanical Engineering
- ◆ Land and Construction Surveying
- ◆ Land Use & Community Planning
- ◆ Transportation Planning & Traffic Engineering
- ◆ Indoor Air Quality
- ◆ Health and Safety Compliance
- ◆ Water and Wastewater
- ◆ Hazardous Materials Management (Asbestos, Lead-based Paint, PCBs)
- ◆ Natural Resources (Wetland/Habitat)
- ◆ Geology/Hydrogeology
- ◆ Environmental Monitoring
- ◆ Permitting (Municipal, State, and Federal)
- ◆ GIS Consulting
- ◆ Informational Technology (IT) Support
- ◆ Drone Services



## **SENSIBLE SOLUTIONS**

CES believes that by listening attentively to the client's needs and working collaboratively on a project, **sensible solutions** are achieved. Functioning as a team promotes effective communication, resulting in the delivery of a project that is individually tailored, cost-efficient, and timely. CES professionals value honesty and commitment and these values drive them to provide each and every client with quality service that meets, and often-times, exceeds their needs. This belief is just one of the reasons clients return to CES over and over again.

## PROFESSIONALS ON STAFF

CATEGORY	NUMBER
Professional Engineers (PE)	17
<i>Civil</i>	6
<i>Environmental</i>	2
<i>Structural</i>	5
<i>Mechanical</i>	3
<i>Electrical</i>	1
Degreed Engineers-In-Training (EI)	4
Certified Geologists (CG)	3
Environmental Scientists	17
Professional Foresters (PF)	1
Professional Land Surveyors	11
GIS Professionals	2
Radon Service Providers	2
Wastewater Treatment Plant Operators	3
Drone Operators	4

## TECHNICAL DIRECTORS

ROLE	DIRECTORS
President/CEO	Denis St. Peter, PE
Executive VP/Surveying Division Director	Jeff Teunisen, PLS
Executive VP/Engineering Division Director	Travis Noyes, PE
Executive VP/Environmental Division Director	John Pond, WWTPO/RSP

## AVAILABILITY OF OUR TEAM

CES is capable of providing \$250,000.00 of engineering and surveying services per week. Our current work load and the projected work load of key personnel is such that any reasonable time schedule which may be established for this project can be met. Since each of our personnel are trained in several different service categories, availability of personnel is assured and schedules are maintained. Project scheduling, personnel scheduling, and resource allocation are done on a weekly basis to identify potential conflicts and to adjust schedules accordingly.

### Mission:

*Provide sensible solutions and exceptional service that lead to achieving the goals of our clients, our employees, and the communities we serve.*

CES' mission reflects our commitment to our clients, colleagues and community and is engrained in our company culture.

### CLIENTS: HISTORY OF EXCELLENCE

By providing exceptional service and sensible solutions to our clients, CES has been recognized with several awards including a 2015 Governor's Award for Environmental Excellence for the Presque Isle Landfill Closure Project, ACEC of Maine's Engineering Excellence Award in 2015 for the Presque Isle Landfill Project and 2016 for the Schoodic Woods Campground, and the Richard J. Haines Memorial Award for Safety Excellence in 2016.



### COLLEAGUES: BEST PLACES TO WORK IN MAINE

CES is proud to be named as one of the Best Places to Work in Maine for four years. Our policies reflect the respect we place on our employees. We understand that to hire and retain the best and qualified staff, our workplace practices need to go above and beyond industry standards demonstrate the value we place in our employees.



### COMMUNITY: SOLVING PROBLEMS

As consultants, we are excited to solve problems. We bring that enthusiasm every day to help our clients meet their goals. This passion also extends to our communities and the problems that our state faces.

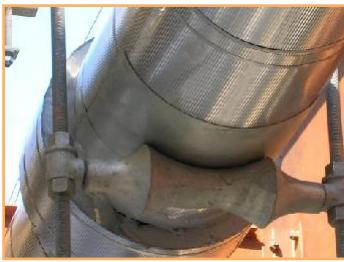
We provide support to community organizations like the Good Shepherd Food Bank's new Hampden Distribution Center, and to the United Way's Annual Campaigns. We know that solving the complex problems surpasses just one organization and takes the support of the business community to create a healthier, stronger State.



*Pledging \$100,000 in support for the GSFB's Food For All campaign, providing capital support for the new warehouse for Northern Maine.*

CES has been named as the **2019 Business of the Year Award** by the Bangor Region Chamber of Commerce for setting an example in leadership, innovation and quality.

# OVERVIEW OF PROFESSIONAL SERVICES



From Top to Bottom: CES Surveyor Utilizing Trimble Equipment; Geoprobe® Investigation, Milford Insulated Sewer Line

## Drone Technology



CES has recently added Drone Technology to our services. With four certified pilots, we are excited to provide this cutting edge technology to our clients.

## Civil Engineering

- Site Development
- Roads and Parking Lots
- Utilities
- Stormwater Management
- Permitting
- Water/Waste Water
- Recreational Trails
- Permitting and Construction Oversight

## Environmental Engineering/Sciences

- Special, Solid, Hazardous Waste Management
- Pollution Prevention and Compliance SPCC Plans, SWPPP, and ICPs
- Environmental Site Assessments
- Federal and State Permitting
- NEPA Evaluations
- Brownfield Redevelopment
- Geology/Hydrogeology
- Asbestos, Lead-Based Paint and PCB Management
- Indoor Air Quality Assessments

## Structural/Industrial/Mechanical Engineering

- Structural Analysis and Building Evaluations
- Structural Design, Building, Marine, Sand/Salt Shed
- OSHA Certifications
- Machine/Equipment Design
- Failure Analysis (Forensic Investigations)
- Pressure Vessels

## Field Services

- Sample Collection and Monitoring
- Ground and Surface Water
- Outdoor/Indoor Air Samples
- Radon and Mold Mitigation/ Monitoring

- Geoprobe® Investigations
- Industrial Hygiene Monitoring
- OSHA/Health & Safety Compliance Monitoring

## Surveying

- Boundary
- Topography
- Construction Layout
- ALTA/ACSM Land Title Determinations
- FEMA Flood Hazard Area Determinations
- Aerial Mapping Control
- Utility Surveys
- GPS Surveys

## Geographic Information Systems

- System Design
- Data Development & Mapping
- Modeling & Analyses

## Transportation

### Planning/Traffic Engineering

- MDOT Traffic Movement Permits
- Road Safety Audits
- Corridor and Pedestrian Studies
- Peer Review
- State and Municipal Permit Applications

## Planning and Development

- Development Peer Review
- Marine and Coastal Planning
- CDBG Assistance and Administration
- Master Planning
- Shoreland Zoning and Comprehensive Plans

## Natural Resources

- Wetland/Habitat Mapping/Delineation
- Environmental Planning
- Soils
- Permitting and Licensing

# ENVIRONMENTAL ENGINEERING & SCIENCES

## Air Emissions

- Potential to Emit Calculations
- Permit Applications
- Annual Emissions Statements
- Best Available Control Technology (BACT) Analyses

## Solid Waste

- Landfills, Transfer Stations, Storage Sites, Beneficial and Agronomic Utilization, Processing Facilities
- Permit Applications
- Facility Design
- Feasibility Studies
- Annual Reporting
- Construction Quality Assurance (CQA)
- Remediation and Closure

## Investigations and Remediation

- Phase I Environmental Site Assessments
- Phase II Environmental Site Assessments
- Voluntary Response Action Program (VRAP)
- Ground Water Fund Coverage for Oil Contamination - ASTs and USTs
- Remediation
- Brownfields Redevelopment

## National Environmental Policy Act (NEPA) Evaluations

## Storage Tanks

- Removal Site Assessments
- Tank Siting Applications
- Variance Applications
- Site Assessments (UST Removal)
- Fire Marshal Permits for AST

## Geoprobe Investigations

- Subsurface Soil Sampling
- Groundwater Sampling
- Monitoring Well Installations
- Subsurface Gas Sampling
- Ledge Probing, Soil Characterization, Geotechnical



## Stormwater Permits

- Municipal Separate Storm Sewer Systems (MS4)
- Multi-Sector General Permits (MSGP) for Industrial Activities
- Storm Water Pollution Prevention Plans (SWPPP)
- Best Management Practices (BMPs)
- Training
- Compliance Evaluations



## Waste Discharge Licenses

- Process and Non-Process Water
- Treatment Systems
- DMRs

## Hazardous Materials Management

- (SPCC) Plans
- Chemical Inventory Reports
- Toxic Release Inventory Reports
- MOAs for Spill Reporting
- Health and Safety Plans
- Hazardous Waste (HW) & UW Management
- Inventory Reporting
- HW Contingency Plans
- HW License Application & Renewal
- Training (HW, SPCC, UW, Asbestos, Lead)
- HW Closure
- Asbestos Evaluation
- PCB Investigation & Remediation Management

## Representative Clients

- Emera Maine
- Coastal Resources
- GAC
- City of Old Town
- AIM Recycling
- Bucksport Generation
- Billings Diesel & Marine Services
- Jasper Wyman & Son
- Maine Independence Station
- Municipal Review Committee
- New England Organics
- Penobscot River Restoration Trust
- ReEnergy Holdings, LLC
- Skowhegan Savings Bank

## NATURAL RESOURCE CONSULTING & ENVIRONMENTAL PLANNING

CES offers a unique blend of expertise and experience to assist clients in finding practical and sustainable solutions to any environmental project. Our staff of professionals includes environmental engineers, wetland biologists, certified soil scientists, environmental specialists, professional foresters, planners and surveyors.

Services we provide include:

### PERMITTING AND LICENSING

- State and Local Environmental Permitting
- Natural Resources Protection Act (NRPA)
- State Site Location of Development Act (SLODA)
- Army Corps of Engineers (ACOE) Permitting
- National Environmental Policy Act (NEPA)
- Support for CERCLA RCRA and Solid Waste Projects

### SOILS

- Soil Survey/Characterization
- High Intensity Soil Survey
- Erosion Control Plans and Analysis
- Soil Composition Analysis
- Hydro-Analysis
- Physical/Analytical Characterization of Encountered Wastes
- Sample Collection
- Soil Suitability Assessments
- Wastewater Disposal System Design

### WETLAND AND NATURAL RESOURCES

- Wetland Delineation and Mapping
- Wetland Functional Assessment
- Mitigation and Compensation

### HABITAT ASSESSMENT AND INVENTORY

- Vernal Pool Identification
- Eel Grass Surveys
- Significant Bird Habitat Identification
- Coastal Habitat Assessments
- Alternative Analysis
- GIS Mapping
- Land Use Planning and Design
- Multi-disciplinary Project Management
- Public Involvement and Facilitation
- Coastal and Waterfront Planning

*First two photographs: Examples of wetlands; Third photograph: Wood frog egg mass*



### REPRESENTATIVE CLIENTS

- Auburn-Lewiston Municipal Airport
- Aresta Housing
- City of Lewiston
- Coplon Associates Landscape Architecture
- Emera Maine
- Hammond Lumber Company
- Jasper Wyman & Son, Inc.
- Madison Paper
- Maine Source Homes
- Mid Maine Solid Waste Association
- Pleasant River Lumber
- Sargent Corporation
- Tetra Tech

# SURVEYING SERVICES

CES prides itself in providing clients with surveying services that exceed expectations. With our experience, state-of-the-art technology, and well-versed staff, no job is too big or too small.

We have a full-service survey staff devoted to performing all types of survey-related work in a timely manner and at a reasonable cost. Our experience allows us to provide each client with the best combination of methods and equipment to meet project goals and client needs. We have four Maine-licensed Professional Land Surveyors and three Maine-licensed Land Surveyors in Training and have the capability to mobilize four field crews. Our crews are cross-trained in all aspects of surveying, including fieldwork, research, drafting, and description writing, so that they can give a "Big Picture" approach to every project.

## LIST OF SERVICES

- Boundary Surveys, Topographic and Utility Surveys
- Architectural Surveys
- Riparian Surveys
- ALTA/ACSM Land Title Surveys
- GIS Mapping, Planning
- Telecommunication Tower Surveys
- Accident Surveys
- Large Utility Corridor Surveys
- Subdivisions and Lot Consolidation Plats
- Construction Layout
- Anchor Bolt/ Steel Framing Plans
- Interior and Exterior Architecture Building, As-Builts and Space Validation
- Monitoring Structural and Ground
- Monitoring Well Location and Certifications
- Wetland Locations
- Aerial Ground Control and Photogrammetry
- Airport Obstruction Surveys
- Hydrographic Surveys
- Geodetic Control Surveys
- R.O.W. and Route Surveys
- FEMA Elevation Certificates
- Property and Easement Descriptions
- As-Built and Final Surveys
- Lot Compilation Sketches

## EQUIPMENT

- Trimble RTK GPS
- Trimble GEOXT
- Topcon Robotics
- AutoCad Civil 3D 2016
- Topcon, LEICA, SOKKIA Total Stations



*"We've had a strong relationship with the team at CES for many years and have been impressed with their leadership, integrity, and professionalism!"*

**Larry Barker**  
President & CEO  
Machias Savings Bank

## REPRESENTATIVE CLIENTS

- Emera
- Sargent Corporation
- Husson University
- City of Brewer
- Cianbro Corporation
- Maine Coast Heritage Trust
- US Fish and Wildlife
- University of Maine System
- Penobscot Indian Nation
- Passamaquoddy Tribe
- Downeast Salmon Federation
- Eastern Maine Medical Center
- MDEP
- Presque Isle Landfill
- Tri-Community Landfill
- Washington Academy
- Town of Machiasport
- The Nature Conservancy
- Cobscook Bay Resource Center
- Downeast Institute
- Washington Cty Unorganized Territories
- Washington Cty Community College
- Bangor Gas

# LAND USE PERMITTING & DEVELOPMENT

The process of developing land requires strategic coordination of many regulatory and non-regulatory groups' interests. During this process, issues such as suitability for the intended use, integration with existing site features, and impact on the environment need to be considered. Potential State regulations that may affect a given project include the State Storm Water Permit and MDEP Site Location Permit. State and Federal regulations may require Natural Resource Protection Act Permits. Several levels of permitting are required depending on the project impact. We are well versed on all aspects of local, State, and Federal permitting.

We also understand the financial requirements projects face and can give guidelines to the advantages of scheduling projects in order to minimize financial burden.

During the land development process, it is necessary to determine whether wetlands will be disturbed. We provide Wetlands Mapping and Delineation Wetlands Impact Assessment, and Wetlands Mitigation services. When wetlands are involved, we take pride in meeting project goals while striving to protect those resources. Our services are consistent with State and Federal requirements, and our employees are among the few in Maine who have successfully completed training courses provided by the U.S. Army Corps of Engineers.

Whether you are planning a small subdivision or a large complex, we are prepared to assist you with the planning and implementation of your project in a manner that will minimize overall cost, development time, and environmental impact, while maximizing the potential of your property. We are available to assist you with essentially all the services required to develop your property, including:

- ◆ Planning
- ◆ Surveying
- ◆ Stormwater Management
- ◆ Road, Site, and Utility Design
- ◆ Traffic Impact Assessment and Permitting
- ◆ Construction Monitoring and Administration
- ◆ Local, State, and Federal Permitting

## REPRESENTATIVE CLIENTS/PROJECTS

- ◆ RH Foster
- ◆ AIM Development | Whole Oceans
- ◆ Hammond Lumber
- ◆ MRC/Fiberight Site Development
- ◆ Convenient MD
- ◆ Town of Baileyville
- ◆ Hartt Transportation
- ◆ Northern Light Health
- ◆ Darlings Auto
- ◆ University of Maine at Augusta
- ◆ Eastport Port Authority
- ◆ Krispy Kreme
- ◆ Schoodic Woods Campground
- ◆ Brewer Housing Authority
- ◆ Machias Savings Bank
- ◆ Key Bank
- ◆ City of Saco
- ◆ Aroma Joes
- ◆ KOA



*From top to bottom: AIM Development Whole Oceans, Bucksport: Eastern Maine Healthcare; RH Fosters – Freshies Various locations*

# ENERGY MARKET SERVICES



Since our founding in 1978, CES has grown into a fully integrated consulting firm offering a wide array of consulting services to assist our clients from project conception through final construction and beyond. Our experience and understanding of the challenges faced by our energy clients allows us to provide reliable support and guidance to assist them in achieving their goals. Our technical staff provides an entire suite of services from initial siting and permitting to post construction and environmental monitoring.

## **SURVEYING**

- Boundary Surveys
- Topographic Surveys
- Utility Surveys
- Elevation certificates
- FAA certifications
- GPS surveys
- Stakeout Services
- Corridor surveys
- Easement descriptions
- ALTA Surveys
- Site Plans
- AS-Built Surveys

## **SITE DEVELOPMENT & CONSTRUCTION**

- Site & Site Access Analysis & Mapping
- Site Characterization
- Parcel and Landowner Mapping
- Site Grading and Drainage Design
- Architectural/Archaeological Investigation & Mapping
- Access Roadway Design
- Asset Management & Facility Maintenance GIS
- Construction Plans and Specifications

- Foundation Geological & Structural Analysis
- Construction Inspection
- Geologic Hazards Identification
- Third Party Inspection

## **ENVIRONMENTAL**

- Natural Resource Assessments
- Wetland Delineation
- Vernal Pool Surveys
- High Intensity Soil Surveys
- Wetland Functional Assessments
- Natural Resource Mapping
- Natural Community Mapping
- Erosion & Sediment Control
- Design/ Inspection
- Rare Threatened & Endangered Species Surveys

## **PERMITTING**

- Municipal, State & Federal Permitting
- MDEP SLODA Permits
- MDEP NRPA
- ACOE Section 404 CWA Permitting
- NEPA Environmental Assessment Permitting
- State Stormwater Permitting

### **Representative Projects**

- Emera Downeast Reliability Project
- Pigsah Mountain, Cianbro Corporation
- Emera Bangor Garland Substation
- Emera Lincoln to Chester Line 85
- Emera NMRS Monticello
- Bangor Gas



## Timothy Brochu

### Senior Vice President / Project Manager

Tim Brochu has 35 years of engineering, construction, and permitting experience with CES. During this time, he has managed the construction of several municipal and private construction projects ranging in total construction costs of \$3 - \$15 million. Tim has a strong background in a wide variety of land development and construction activities throughout the state of Maine and has worked on numerous municipal, industrial, and private improvement service projects. Tim's responsibilities on these projects included a variety of civil engineering design and studies associated with construction projects. Other duties include: storm water management, site plan design, roadway design, grading plans, erosion control plans, construction specifications, utility installation designs, project administration, and construction inspection. Tim has extensive experience working with the Maine Department of Environmental Protection (MDEP), U.S. Army Corps of Engineers, U.S. Environmental Protection Agency, and many Maine Municipal Governments.

tbrochu@cesincusa.com  
(207) 989-4824 ext. 2206



#### Core Expertise

Engineering, Construction, and Permitting

Storm Water Management

Site Plan and Roadway Design

#### Education

TR-20 & HydroCAD  
J.E.T.C.C.

Soil Conservation Services  
Storm Water Best Management Practices

#### Registrations

Professional Land Surveyor, State of Maine #2222

State of Maine, Engineering Intern

Certified Professional In Erosion & Sediment Control #3886

#### Affiliations

National Society of Professional Engineers

Maine Society of Land Surveyors

Brewer Land Trust, President

## Professional History

### 2009 – Present

CES, Inc.  
Senior Vice President / Principal

### 1990 – Present

CES, Inc.  
Project Manager / Senior Project Engineer

### 1983 – 1990

CES, Inc.  
Engineering Technician / Assistant



## Project Experience

### **Public Works Facility | Bar Harbor, Maine**

As Project Manager, Tim provided design, permitting, and construction management for construction for the new Public Works Facility located in the village of Hulls Cove. Tim assisted the Town department leaders with projected cost estimates which were required to secure funding. The project consisted of a new sand/salt shed, highway and water department garage, and a pole barn for highway vehicle storage. The project was completed in the spring of 2014 and resulted in a central location for Town services.

### **Private Residence | Seal Harbor, Maine**

As Project Manager, Tim provided civil design and construction management for a new residential estate located in Seal Harbor. The project consisted of approximately \$12 million in new estate building and associated support building construction. Tim maintained the day-to-day management of the construction and provided valued engineering input throughout the project to meet the expected goals and budgets. The project duration was approximately 18 months and was completed in the summer of 2012.

### **Machias Savings Bank | Brewer, Maine**

As Project Engineer, Tim provided design and permitting services under the National Resources Protection Act (NRPA) for the establishment of a new regional branch office complex in Brewer. This project required permits from the MDEP as well as the U.S. Army Corps of Engineers.

### **Residential Subdivision: East Ridge Estates | Bangor, Maine**

As Project Engineer, Tim provided design and permitting services on the establishment of a 14-lot residential subdivision and 2,000 feet of access road. Design included establishment of buildable areas on each lot with on-site subsurface wastewater disposal as well as storm water control provisions. Additionally, the roadway was designed and permitted under the State of Maine storm water regulations.

### **Looks Gourmet Food Co. | East Machias, Maine**

This project involved a Topographic Survey, an engineer's flood study analysis for the determination of a Base Flood Elevation in a Zone A, and the preparation and submittal of documentation for a Letter of Map Amendment (FEMA Case No. 05-01-0785A). The subject commercial warehouse property fronts on the East Machias River. Field investigations were conducted utilizing GPS instrumentation to transfer elevation datum to the site and conventional total station instrumentation for the x-sections of the river and topography. Tim served as Project Engineer for this project.

### **Jim Beal / Boat Builder | Milbridge, Maine**

As Project Manager, Tim provided design, permitting, and construction assistance for the renovation of docking and boat launching facilities for Jim Beal's lobster boat building operations



in Milbridge. This project consisted of launching facilities for new boat construction to eliminate travel over town roads to other launching facilities.

#### **Blair West/BBS Lobster Trap | Steuben, Maine**

This project included expansion of docking and launching facilities at the BBS Lobster Trap facility in Steuben. This is a commercial pier which provides access to local commercial fishermen for loading supplies, fuel sales, and sale of lobster catches. Construction required modification of historic MDEP permits and securing new permits from U.S. Army Corps of Engineers.

#### **BBS Lobster Trap | Steuben, Maine**

As Project Manager, Tim provided civil and structural design as well as construction management for construction of a new lobster grading and shipping facility. The new two-story 12,500 SF structure was an addition to a smaller on-site facility. The construction site was on an existing solid fill pier and required coordination with MDEP to secure permits.

#### **Daigle Oil Company | Bangor, Maine**

This project involved the reconstruction of the site conditions and replacement of existing underground fuel tanks at an existing gas station and convenience store. Site reconstruction included complete excavation of the site and regrading to improve drainage. New gabion retraining walls were also designed to stabilize failing site slopes along an existing brook. Tim provided design drawing details and oversaw construction installation.

#### **University of Maine | Farmington, Maine**

This project includes the design and installation of a central energy plant and distribution lines to heat university buildings. This bio-mass fueled facility will replace conventional oil burning furnaces in each conversion building. As project manager, Tim was responsible for coordinating the construction plans for the central energy plant structure and developing the routing plans for the distribution system. The project is scheduled for completion in the fall of 2015.

#### **Jonesport Wind – Kean Energy | Jonesport, Maine**

This project included the permitting of a small-scale wind energy farm in Jonesport. As project manager, Tim coordinated permitting requirements with the MDEP and U. S. Army Corps of Engineers for roadway and access road construction. This project is currently pending.

#### **Pisqa Mountain Wind Farm | Clifton, Maine**

Tim served as project manager and designer of the infrastructure associated with a five-tower wind farm in Clifton. This included access roadway and tower site assessment and design of stormwater conveyance and treatment measures. The project services also included preparation of permit applications for the MDEP.

#### **Bar Harbor Public Pier | Bar Harbor, Maine**

This project included the design and installation of an architectural safety fence and brick paver sidewalk on the public pier in Bar Harbor. As project manager, Tim was responsible for developing an architectural design of the proposed fence to match existing municipal park fences in the area. The sidewalk reconstruction included resetting existing brick pavers and improving grades to allow effective stormwater runoff.



### **Town of Eastport | Eastport, Maine**

Serving as project manager, Tim completed the design review of the proposed inner harbor dredging plan. The project included assessing the current conditions of the tidal ocean floor and determining dredging limits to provide a safe mooring area for commercial fishing fleet vessels. This included field investigations, surveys, and permitting through state and federal agencies.

### **Number 3 Pond Dam | T3-RI, Maine**

This project consisted of developing and installing necessary repairs to an existing, approximately 100- year old dam. This dam regulated and maintained water levels in the pond. As project manager and designer Tim developed construction plans and details for the repairs and oversaw construction. Tim also secured the necessary repairs required by the Maine Land Use Commission.

### **Coast of Maine Organics | Marion Township, Maine**

Tim served as project manager for the expansion of composting and packaging of the existing operation facility. This included the design and construction of a year-round bagging and office facility and expansion of composting areas. This included the structural and site engineering and necessary solid waste processing permits as required by the MDEP.

### **Otter Creek Boat Landing | Mount Desert, Maine**

This project consisted of the design and construction of a car top boat landing in the village of Otter Creek. The landing included construction across and adjacent to, U.S. National Park Lands. As project manager, Tim assisted the town with design and permitting through several state and federal agencies.

### **Penobscot Views Subdivision | Lincolnville, Maine**

As project manager, Tim provided design and permitting services for a 12-lot residential subdivision. This project required design of approximately 1200 LF of access roadway and approvals from the local planning board. The establishment of lots required on site assessments for subsurface disposal and determination of buildable areas.

### **Somesville Library | Mount Desert, Maine**

This project consisted of the design and installation of RIPRAP erosion control measures to protect the existing library building. The project was complicated by the close proximity of the building to the eroded shoreline and limited access by construction equipment. As project manager, Tim designed a stable RIPRAP (stone) protection slope and developed construction methods for the installation.



## Travis E. Noyes, PE

### Principal-in-Charge / Project Manager

Travis E. Noyes has over 24 years of civil engineering experience related to site development and infrastructure design and analysis. Travis has worked on a wide range of projects including roads, trails, and site design, wastewater treatment plant upgrades; pump station design; water system analysis and design; civil utility; Capital Improvement Plan for development for water utilities; and project management. Travis also has experience coordinating with State and Federal funding agencies for sewer and water projects. Along with his project management experience, Travis serves as the Engineering Division Director where he is responsible for ensuring appropriate resources are allocated to meet the goals and milestones of each project.

tnoyes@cesincusa.com  
(207) 989-4824 ext. 2303



#### Core Expertise:

Site Design and Permitting  
Utilities and Roads  
Capital Improvement Planning

#### Education

B.S. (1996) Civil and Environmental Engineering, University of Maine

#### Registrations

Professional Engineer, State of Maine (#9713)

#### Affiliations

American Council of Engineering Companies, State of Maine Chapter Board Member

## Professional History

### 2008 – Present

CES, Inc.  
Project Manager

### 2003 – 2008

Woodard and Curran  
Project Manager / Team Leader / Regional Delivery Manager

### 2001 – 2003

City of Brewer  
Assistant City Engineer

### 1996 – 2001

CES, Inc.  
Project Engineer



## Project Experience

### **Campground Development | Winter Harbor, Maine**

Travis is currently acting as project manager for the development of a 150-acre campground which includes approximately 100 sites and a variety of mixed use non-motorized vehicular trails. There are approximately five miles of trails associated with the project. The project construction start date was summer 2013. The project required a SLODA permit, local permitting, and a NRPA permit for wetland and vernal pool impacts.

### **Verso | Bucksport, Maine**

Travis served as Project Manager and Project Engineer for the site design and permitting of a new wood yard associated with a wood handling process upgrade. The site design focused on balancing stormwater collection needs with maximizing the wood yard area within the constraints of the new process. Travis was responsible for coordinating all tasks with the lead engineering firm, our direct client for this work, BE&K Engineering from North Carolina. SLODA permit amendments were required.

### **Maine Veterans Home | Machias, Maine**

As Project Engineer for the design of new utilities to service facility, including storm water collection, wastewater collection, water distribution, electrical, and communications, Travis assisted in site design review and specification production. He was responsible for coordinating all tasks with the lead Architectural firm. Amendments to the site SLODA were required.

### **The Jackson Laboratory | Bar Harbor, Maine**

Travis served as Project Engineer for the design of new utilities to service an expansion of the existing facility and a new 150 space parking lot. Design included storm water collection and wastewater collection. Travis also assisted in site design and specification production, coordinated all tasks with the lead Architectural firm and Laboratory. This work also resulted in a need to amend the SLODA permit for the site.

### **Hartt Transportation | Auburn, Maine**

Travis managed the design of a seven-acre site expansion, road design, and utilities within an existing business park in Auburn. Follow up services include assisting the owner with obtaining SLODA amendments for future expansion needs.

### **Site and Utility Design | SeDoMoCha Middle School | Dover-Foxcroft, Maine**

Travis served as Project Engineer for site design and utility design for the expansion of an existing elementary school. The utility design included replacement of existing sewer piping, a new stormwater collection system, and water mains. Site design focused on an expansion of access to the site and significant improvements to existing parking conditions as well as improvements to the existing athletic fields. He was responsible for coordinating all tasks with lead Architectural firm.



### **Site Design | Hope School | Hope, Maine**

Travis was Project Engineer for site design for the expansion of an existing elementary school. The site design focused on an expansion of access to the site and significant improvements to existing parking conditions as well as improvements to the existing athletic fields.

### **Utility Design | Maine Veterans Home | Machias, Maine**

Travis assisted in site design review and specification production in his capacity as Project Engineer for this site. His duties included the design of new utilities to service facility, including storm water collection, wastewater collection, water distribution, electrical, and communications. He also coordinated all tasks with lead Architectural firm.

### **Utility Service Design | The Jackson Laboratory | Bar Harbor, Maine**

Travis served as Project Engineer for the design of new utilities to service an expansion of the existing facility. The design included stormwater collection and wastewater collection. He also assisted in site design and specification production, as well as coordinated all tasks with lead architectural firm.

### **Facility Expansion | USDA National Cold Water Marine Aquaculture Center | Franklin, Maine**

Travis was Project Engineer for the site design and utility design for the expansion of an existing aquaculture research facility. The utility design included effluent discharge piping and influent fresh and salt water lines. Site design focused on significant grade changes and new access roads to accommodate new buildings. Travis helped to produce specifications for the construction project, and coordinated all tasks with lead Architectural firm.

### **Infrastructure Improvements | Milford, Maine**

CES was hired by the Town of Milford and the Old Town Water District to prepare the design of improvements within the Davenport Street neighborhood. The improvements included the design of new road, stormwater collection and conveyance, sanitary sewer collection and conveyance, potable water distribution, sidewalks and roadways. The value of the work was nearly \$2.5 million.

### **Infrastructure Improvements | Castine, Maine**

CES was hired by the Town of Castine to design Phase I of their Long Term Infrastructure Improvements project. Phase I included approximately \$2,000,000 worth of improvements. The project included the design of improvements to roads, stormwater systems, water mains, and sewers for portions of Battle Avenue, Perkins Street, and Wadsworth Cove Road. Travis served as Project Manager for this project.

### **Commercial Park | Baileyville, Maine**

Travis assisted the Town of Baileyville with the permitting and design of the extension of an existing Commercial Park. The Park is currently capable of serving two lots and the Town has plans to extend the road and utilities out approximately 1,700 feet to serve approximately eight more lots. Phase II of construction included the construction of a road, sewer, water, and electrical extensions.



### **Large Retail Commercial Development | Bangor, Maine**

CES recently completed the evaluation and design of nearly 2,000 feet of sanitary sewer improvements and nearly 4,200 linear feet of storm drainage improvements. The project includes the design of pervious pavement to be utilized as a stormwater treatment mechanism.

### **Road Reconstruction | Newcastle, Maine**

Travis served as Project Manager for the design of the reconstruction of three roads in Newcastle. The projects included full-depth reconstruction, reclaim and pave, and drainage improvements.

### **Road Reconstruction | Veazie, Maine**

Travis was Project Manager for the design of the reconstruction of seven roads/streets in Veazie. The projects included full-depth reconstruction, drainage improvements, and sewer and water improvements.

### **Capital Improvement Planning | Bar Harbor, Maine**

Travis served as Project Engineer assisting the community with the development of a Comprehensive Master Plan. The work included utilizing the previously-developed distribution system model to identify problem areas within the system and develop potential improvements to remedy the problems, making recommendations for future projects, developing cost estimates for the proposed improvements, and development of a unidirectional flushing program.

### **Capital Improvement Plan, Richmond Utilities District | Richmond, Maine**

Travis acted as Project Manager for the Capital Improvement Plan. The project included GPS location of all available water system components, development of a System Map, development and calibration of a WaterCAD water system distribution model, analysis of the system to identify deficiencies, a prioritized listing of recommended improvements for the District, and a report summarizing our findings along with cost estimates for each recommendation. The Plan outlined Short Term and Long Term recommendations.



## **Jon H. Whitten, Jr., PE Project Manager**

Jon H. Whitten, Jr. has over 20 years of civil engineering experience related to site development and infrastructure design, stormwater management, and commercial development. Jon has worked on a wide range of projects including subdivision planning and permitting, site planning and permitting, roadway and utility design and extensions, as well as stormwater and erosion control design. Jon also has experience coordinating with State, Federal and Local regulatory permitting and has been involved in the management, design and permitting of numerous projects throughout Maine. Along with his project management experience, Jon has worked on projects involving gravel and rock extraction permitting, solid waste permitting, construction observation, post construction inspections and stormwater management inspections.

jwhitten@cesincusa.com  
(207) 989-4824



### **Core Expertise:**

Site Design and Permitting  
Utilities and Roads  
Construction  
Administration/Oversight  
Environmental Permitting

### **Education**

B.S. (1997) Civil Engineering, University of Maine, Orono

### **Registrations**

Professional Engineer,  
State of Maine (#10414)  
MDOT LPA Certified

### **Affiliations**

American Society of Civil Engineers  
National Society of Professional Engineers

## **Professional History**

### **2019 – Present**

CES, Inc.  
Project Manager

### **2015 – 2019**

Plymouth Engineering Inc.  
Senior Project Manager

### **2006 – 2015**

Terradyn Consultants, LLC  
Project Manager / Project Engineer

### **1996 – 2001**

Sebago Technics, Inc.  
Project Manager / Project Engineer



## Project Experience

### **Town of Baldwin | Baldwin, Maine**

Jon served as Project Manager and Project Engineer for the stormwater modeling of over 200 acres of mountainous terrain to establish flow characteristics and flood levels at two problematic culvert crossings on Brown Road in Baldwin, Maine. The re-design of the culvert crossings included the installation of new, larger pipes as well as new vertical alignment for approximately 700 LF of roadway. Jon coordinated with FEMA and MDEP throughout the project design and construction observation for this project.

### **Dearborn Precision Tubular Products, Inc. | Fryeburg, Maine**

Jon managed the campus planning and design, site grading, stormwater management and permitting for a large expansion of an existing site. The site included 22 acres of impervious area on a 76-acre parcel of land. Stormwater management features included catch basin and pipe system, dry swales, and large infiltration basins. Jon worked closely with a construction firm to obtain a Site Location of Development Permit from MDEP for this project.

### **Watchic Lake Association | Standish, Maine**

Several waterfront properties on the eastern shore of Watchic Lake were experiencing degradation of their property due to lack of stormwater runoff control. Jon worked with landowners, Watchic Lake Association Members, the Town of Standish, and MDEP to develop a shared stormwater management system to responsibly convey runoff from the north side of Route 114 to Watchic Lake. Work included the use of natural, wooded wetlands to temporarily impound runoff, a serpentine, vegetated swale and a settling basin, swale and culvert system.

### **Residential Development Projects | Various Locations, Maine**

Longfellow Street Condominiums, Westbrook, Maine – 12-unit condominium project with private access drive, public water and sewer, underground utilities, natural gas, and LID stormwater features.

Majestic Woods Subdivision, Westbrook, Maine

Patrick Drive, Scarborough, Maine

Shalom House, Inc., Westbrook, Maine – 5-unit building

Olde Woolen Mill, MSHA Housing, North Berwick, Maine

Jockey Cap Ridge Subdivision, Fryeburg, Maine

Mobius, Inc. Damariscotta, Maine – 5-unit building

MSHA Rental Housing, Chebeague Island, Maine

Convene Road Subdivision, Sebago, Maine

Hawthorne Lane Subdivision, Westbrook, Maine

Knight Street Subdivision, Westbrook, Maine

Fox Hill Estates, Naples, Maine



## **Commercial Site Plans | Various Locations, Maine**

Village Green History Park, Windham Historical Society  
McDonald's Restaurant Addition, Bridgton, Maine  
Fire and Rescue Station, Town of Sebago, Maine  
Salt Storage Shed, Town of Limington, Maine  
Construction Demolition and Debris Recycling Facility, Naples, Maine  
Coastal Kids Preschool, Damariscotta, Maine  
Burns' Fencing Co. Office Building, Westbrook, Maine  
Windham Youth Soccer, Soccer Field, Windham, Maine  
Shaw Earthworks, Inc., Office and Shop, Gorham, Maine  
Becky's Diner, Portland, Maine  
Westbrook Heights Business Park, Westbrook, Maine



## Jeff A. Teunisen, PLS

### Executive Vice President / Survey Division Director

Jeff Teunisen has over 25 years of experience in surveying and as Division Director. Jeff is responsible for project development, project oversight, internal management, staff development, and team coordination. Jeff takes an active role serving as a client liaison, providing budget and technical oversight for boundary, topographic, and construction survey services. In addition, he is a team leader on small and large site development projects. Jeff is responsible for conceptual, planning, and permitting phases for a variety of development projects. He works closely with other departments within our Brewer Corporate office, and the offices in Fort Myers, Florida, Lewiston, Waterville, Machias, Saco and Presque Isle.

jteunisen@cesincusa.com  
(207) 989-4824 ext. 2205



#### Core Expertise:

Survey Management  
Boundary Analysis  
Construction Staking  
Survey Consultant

#### Education

B.S. (1997) Journalism,  
University of Maine, Orono  
A.S. (1992) Surveying  
Engineering Technology,  
University of Maine, Orono

#### Registrations

Professional Land  
Surveyor, State of Maine  
#2365

FAA Part 107 sUAS  
Remote Pilot

#### Affiliations

Maine Society of Land  
Surveyors  
National Society of  
Professional Surveyors  
Boy Scouts of America  
Land Development Board  
Maine Waterfowl Council,  
Penobscot Co. Rep.

## Professional History

### 2009 – Present

CES, Inc.  
Executive Vice President

### 2006 – Present

CES, Inc.  
Principal

### 2002 – Present

CES, Inc.  
Survey Manager

### 1997 – 2002

CES, Inc.  
Survey Technician



## Project Experience

### **Downeast Reliability Project: Bangor Hydro Electric Company | Bangor, Maine**

CES contracted with Bangor Hydro Electric Company (BHE) to provide a full range of land surveying services for a proposed 43-mile transmission corridor from Ellsworth to Harrington, Maine. The line upgrade will serve residents of Washington and Hancock Counties with more reliable electricity.

Initially, while the route was being determined, CES provided BHE map exhibits showing the proposed routes, landholders, and published natural resource information. The utilization of GIS was an integral part of the initial investigatory phase. CES produced maps showing the route for public display and for presentations at local Planning Board meetings.

CES survey crews were tasked with setting up a control network along the 43-mile route. The utilization of a tight GPS control network was instrumental in the success of the survey. Most of the 43-mile route was heavily wooded and the survey crews were responsible for collecting ground topography throughout the corridor. In addition, our survey staff compiled boundary information, conducted deed research and compiled all data into a project digital drawing for the project design team and the land acquisition team.

CES survey crews were also responsible for staking the clearing limits for the entire project. The staking was conducted in heavily wooded areas with traditional surveying instrumentation. After the clearing was complete, CES was engaged by BHE to stake the proposed poles and guy wire locations.

A majority of the project's success was attributed to CES's ability to manage such a large project. CES accomplished this through effective team collaboration that resulted in the completion of all project phases in a timely manner. The team was highly responsive to the client's needs and assigned field crews that were capable of tackling the technical and physical demands of such a large-scale survey.

### **City of Bangor | Waterfront Concert Venue | Bangor, Maine**

In 2018 CES was awarded a boundary and topographic survey for the Bangor Waterfront concert area. This large-scale survey project of over 35 acres is being utilized for future improvements and planning for the successful concert venue. While the focus of our work was a boundary survey and topography survey, CES was tasked with full boundary research, including right of way lines.

CES worked with City Staff to map underground utilities throughout the entire site for future design and improvements planned for the facility. CES utilized existing GIS information pertaining to some underground utilities, and also obtained invert information for a large sewer line running through the property. This project was unique in that a variety of instrumentation was used throughout the project. We utilized aerial imagery, GPS equipment, auto-levels, robotic total stations and traditional Theodolites. The base map was related to State Plane Coordinates. Jeff was the lead surveyor on the project.



### **TRC Solutions | Farmington and Sanford Solar, Maine**

CES was contracted by TRC Solutions to provide ALTA Surveys, Easement Surveys and various property descriptions for large-scale solar array projects in these two communities. Initial field work was conducted to establish existing property lines for site development and permitting. Once the projects were fast-tracked, CES was involved with ALTA surveys of the properties slated for development. Time-sensitive submittals were produced, along with final ALTA surveys of the properties. Jeff was the lead surveyor and contact person for TRC and the projects are continuing during 2019.

### **Gale Associates, Navy Sites | Various Sites in Maine**

CES was engaged by Gale Associates to perform large scale topographic and boundary surveys for four sites in Maine. Jeff oversaw the projects located in Rangeley, Cutler, Prospect Harbor and Great Pond. The projects included detailed surveys of all improvements, including roads at each site. To meet the client's aggressive project schedule, CES utilized both RTK and traditional surveying services. In addition, the survey information was utilized internally where CES created a large-scale GIS database of each site.

### **Bangor Natural Gas | Various Sites in Maine**

In 2014, CES was contracted by Bangor Natural Gas to update their base maps for planning, design and permitting for proposed natural gas infrastructure throughout the Bangor Region. CES was tasked with working closely with a local utility locating company to map underground utilities with the project areas slated for new services. CES surveyed over 20 miles of roadways and project areas and verified Right of Way locations along the routes. Locations included waterlines, storm drain and sewer systems, all existing improvements within project areas including trees and shrubs. Our timely delivery of updated base maps was a critical step in the success of the projects as the survey, design and installation of gas lines occurred during months of no snow cover.

### **Hoyle, Tanner & Associates | Millinocket and Lincoln, Maine**

Jeff was the lead surveyor for the obstruction mapping project at both the Millinocket and Lincoln Airports. His duties included oversight of ground surveys and ground control of aerial imagery to facilitate removal or lighting of obstructions to air navigation, in accordance with Federal Aviation Administration (FAA) advisory circulars. Off-airport boundary surveys are being conducted for easements needed for future maintenance. Tree clearing was also conducted on this project. Jeff served as lead surveyor for staking of the limits for the contractor.

### **Forest Society of Maine | Piscataquis, Maine**

CES was proud to be part of the Forest Society of Maine's team for a large conservation easement of over 4,300 acres of land surrounding Silver Lake and the West Branch of the Pleasant River in Piscataquis County. This project involved surveying and marking the easement boundaries, writing descriptions, and plan creation for what is dubbed by the Forest Society of Maine as an important conservation effort related to wildlife species of state and national significance, one of Maine's finest silver maple floodplain forests and an area popular with outdoor enthusiasts.



### **Northeast Harbor, Maine**

Jeff was the lead surveyor for a large topographic and right of way survey for a portion of the Village of Northeast Harbor; located in Mount Desert Maine. Drainage issues surround a portion of the community and Jeff conducted a survey where Rights of Ways were researched and plotted, topography was captured and utilities were also located. The information was then passed on to CES Engineers for their design phase of the project.

### **Hammond Lumber | Various Sites in Maine**

CES was engaged by Hammond Lumber after their acquisition of EBS to compile boundary surveys of all of their existing and new sites throughout the State. The client wanted CES to compile all pertinent site information for each site for future planning and on-site management. Boundary surveys were conducted and property lines were monumented for clarity on the ground. Jeff worked closely with Hammond Lumber and CES Surveyors to provide the client with boundary plans showing improvements to the existing facilities.

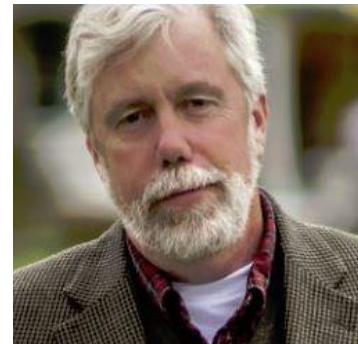


## **Michael E. Thompson**

### **Senior Project Scientist**

Michael Thompson is a consulting ecologist and has over 37 years of experience in wildlife research, forest ecology, biometrics, ecological risk assessment, rare plant and animal conservation, ecological restoration, wetlands, marine science, and aquatic ecology. While serving a wide range of clients, Mike specializes in projects related to natural resource conservation and management, renewable energy, ecological risk assessment, transportation, forest management, and outdoor recreation planning. As a past president of the North Atlantic Chapter of the Society of Environmental Toxicology and Chemistry (SETAC), Mike has worked on large and small contaminated sites, including PCB sites on the Housatonic River in Massachusetts, and the Hudson River in New York. Mike has been involved in major FERC hydropower relicensing projects and has also worked on nuclear power plant decommissioning efforts in Massachusetts and Connecticut. Mike also has experience with permitting and post-construction monitoring at wind power projects throughout the U.S.

[mthompson@cesincusa.com](mailto:mthompson@cesincusa.com)  
(207) 989-4824



#### **Core Expertise**

Professional Wetland Scientist  
Certified Wildlife Biologist  
Natural Resource Permitting  
Ecological Risk Assessment

#### **Education**

PhD (in prep) Forest Ecology, University of Maine, Orono  
M.S. (1987) Wildlife Management, University of Maine, Orono  
B.S. (1981) Wildlife Resources, Quantitative Option, University of Idaho, Moscow

#### **Registrations**

Professional Wetland Scientist # 831

#### **Affiliations**

Society of Wetland Scientists  
Friends of Maine's Seabird Islands, Rockland, Maine, Chair, Board of Directors

#### **Professional History**

##### **2017 – Present**

CES, Inc.  
Senior Project Scientist

##### **2007 – 2017**

Penobscot Environmental Consulting, Inc.  
President / Principal Ecologist

##### **2015 – 2017**

Tetra Tech, Inc.  
Senior Ecologist

##### **2015 – 2017**

Stone Environmental, Inc.  
Senior Ecologist

##### **2011 – 2012**

First Wind  
Environmental Permitting & Compliance Manager



## Project Experience

### **Loring Air Force Base Superfund Site | Limestone, Maine**

Mr. Thompson was a project scientist working on site characterization and stream restoration components of the Loring Air Force Base Superfund Site in northern Maine. His work included delineating wetlands and other natural resources, recording potential contamination areas, and working with the team developing and implementing ecological restoration plans following the remediation of Greenlaw Brook, an important salmonid spawning stream.

### **Housatonic River Superfund Site | Pittsfield, Massachusetts**

Mr. Thompson was the lead investigator working closely with the USEPA and USFWS on an assessment of PCB impacts on amphibians breeding in vernal pools in the floodplain of the Housatonic River near Pittsfield, MA. As part of this project he also advised the USEPA and USFWS on sample size requirements for characterizing fish biomass and determining the relationship between fish size and PCB tissue concentration levels.

### **First Wind | Portland, Maine**

Working with the lead engineering team, Mike was instrumental in finalizing project design and construction methods needed to ensure full compliance with local, State, and Federal permits.

### **Irving Woods, LLC | Fort Kent, Maine**

As a member of the Scientific Certification Systems, Mike and his team provided auditing services for 1.2 million acres of forest land in northern Maine against the Forest Stewardship Council (FSC) Standard.

### **Wagner Forest Management, Ltd. | Various Sites, Maine**

Mike was the lead ecologist responsible for developing several deer wintering area habitat management plans on private forestlands in Maine. As part of this work, he conducted studies related to old growth forests and other unique ecological areas.

### **Yankee Nuclear Power Station | Rowe, MA**

Mike was responsible for monitoring ecological restoration of a nuclear power station as it was being decommissioned. This project included wetland delineation, rare plant surveys, State and Federal permitting, and 3 years of environmental compliance monitoring during construction phases. As lead Science Diver, Mike assisted in the collection of lake sediments using SCUBA associated with the final decommissioning of Yankee Nuclear Power Station.



## **TransCanada Hydro Northeast Deerfield River Recreation Enhancement Plan | Monroe Bridge, MA**

Mike designed, permitted, and oversaw construction of FERC-mandated enhancements to boat launches, picnic areas, and hiking trails as part of a 10-year recreational enhancement program for the Deerfield River Hydroelectric Project.

## **Knox County Regional Airport | Owls Head, Maine**

As lead scientist for this project, Mike was responsible for wetland mitigation efforts associated with airport expansion and runway improvements. This project included identifying suitable wetland mitigation projects, landowner negotiation, and client representation in regulatory proceedings.

## **Wind Power Projects | Various Sites, Eastern United States**

Mike provides senior environmental consulting services on a variety of projects that include wind power permitting and post-construction monitoring, acoustic bat surveys with an emphasis on northern long-eared bats, and avian surveys at proposed and operating wind farms. He was also project manager and senior ecologist for post-construction bat fatality monitoring at a wind farm in Oklahoma. Mike also provides QA/QC oversight and statistical analysis for bird and bat risk assessment studies associated with proposed wind power projects.

## **Maine Department of Transportation | Calais Border Crossing | Calais, Maine**

As lead scientist for this project, Mike's duties included wetland mitigation efforts associated with a new border crossing to Canada. This project required identifying suitable wetland mitigation projects, landowner negotiation, and client representation in regulatory proceedings.

As Wetland Scientist, Mike worked to provide wetland delineation and permitting support for several clients in Southern Maine:

- ◆ Coastal Maine Botanical Gardens | Boothbay, Maine – proposed expansion
- ◆ City of Bath, Maine – pump station upgrades
- ◆ Town of Falmouth, Maine – sewer force main upgrades
- ◆ Private Client, Boothbay, Maine – develop planting plan to restore site cleared in violation of Shoreland Zoning Ordinances

Mike has also been involved as lead auditor for Climate, Community & Biodiversity Alliance (CCBA) validation processes for the following entities:

- ◆ REDD Forests | Tasmania
- ◆ The Conservation Fund | Mingo NWR, MO
- ◆ The Conservation Fund | Grand Cote and Lake Ophelia NEW, LA



- ◆ Forest Carbon Offset, LLC | Boden Creek Preserve | Toledo District, Belize

## Publications

Wesely, N., S. Fraver, L.S. Kenefic, A.R. Weiskittel, J-C. Ruel, M.E. Thompson, and A.S. White. 2018. Structural attributes of old-growth and partially harvested northern white-cedar stands in northeastern North America. *Forests* 2018 9(7), 376.

Thompson, M.E. 2012. *Ethics in Environmental Consulting*. Environmental Practice, Vol. 14, Issue 3.

Thompson, M.E. 2008. Integrating rare species conservation into forest management planning in northern Maine. Internal workshop for foresters on private forestlands in northern Maine.

Thompson, M.E. and Lortie, J.P. 2004. Designing and implementing field studies of amphibians and reptiles on contaminated sites. North Atlantic Chapter SETAC Annual Meeting Short Course.



Engineers • Environmental Scientists • Surveyors

## APPENDIX A. QUALIFICATIONS

### 6.1 RSG'S EXPERIENCE

RSG has been involved in noise assessments for wind farms and other power projects since 1993. At that time, we were asked by the Maine Land Use Regulatory Commission to evaluate a large wind development in the western part of the state. Subsequently, we have performed noise analyses at over eighty wind projects. RSG has led wind energy noise studies in Minnesota, Maine, Michigan, Arizona, California, Colorado, Illinois, Indiana, Hawaii, New York, Kansas, Massachusetts, Missouri, Nebraska, New Hampshire, Ohio, Pennsylvania, West Virginia, South Dakota, and Vermont.

In addition to wind projects, we have extensive experience with noise analyses of solar, biomass, and other power generation, substations, and power lines. Figure 3 shows a map of some of RSG's renewable energy projects.

We have performed noise analyses at over eighty wind projects including several projects in Maine.

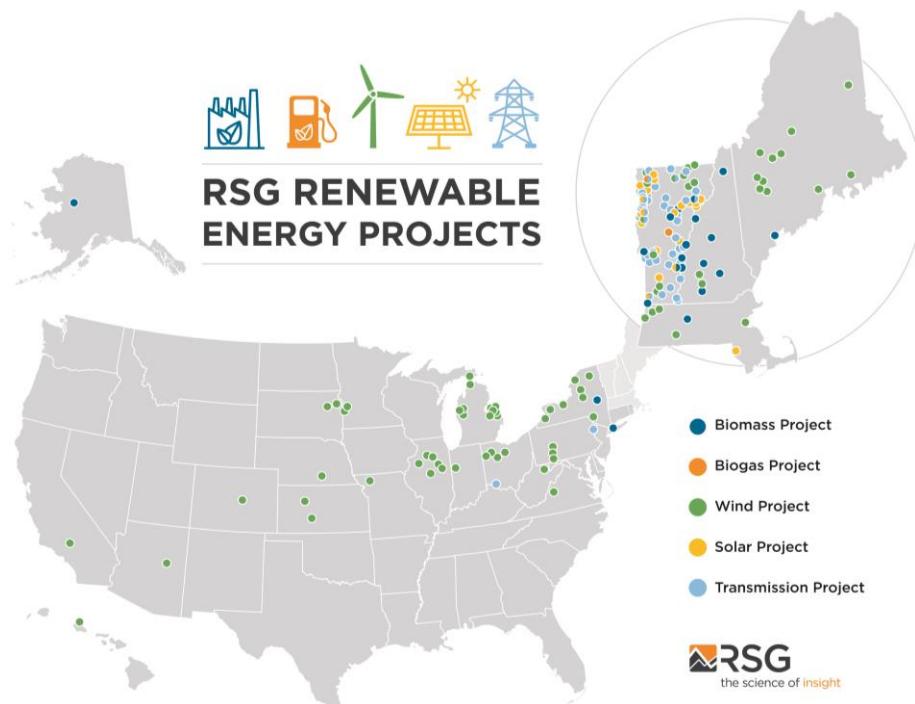


FIGURE 3: RSG RENEWABLE ENERGY PROJECTS (PARTIAL LIST)

We have extensive experience with noise analyses at power generation and transmission stations, including noise from transformers, reactive devices, synchronous condensers, and high-voltage power lines.

Beyond evaluating specific development projects, RSG led a team in conducting research to understand the special factors related to the prediction and measurement of wind turbine noise for the Massachusetts Clean Energy Center (MassCEC) and the Department of Environmental Protection (MassDEP). The project team worked to develop a comprehensive data collection scheme involving overall sound levels, spectral sound levels, infrasound monitoring, and amplitude modulation at multiple sites, concurrent with meteorological data. The analysis involved correlations of these various acoustical parameters with site and weather conditions. Ultimately, the study is helping inform MassCEC and MassDEP of the variance and sensitivity around certain parameters that could be used in their efforts to establish pre- and postconstruction evaluation protocols and standards.

Over the last few years, RSG has been working on research with Lawrence Berkley National Laboratories and the Department of Energy looking at public acceptance of wind energy and the effects of sound level on attitudinal variables.

RSG is a recognized leader in research and analysis of wind turbine noise. Our publications and presentations include:

- “Public Acceptance of Wind Energy: Impact of Sound Levels,” Acoustical Society of America, December 2017.
- “Wind Turbine Noise Dose Response – Comparison of Recent Papers,” Proceedings of the 7<sup>th</sup> International Conference on Wind Turbine Noise, May 2017.
- “Methods for Assessing Background Sound Levels during Post-Construction Compliance Monitoring within a Community,” Proceedings of the 6<sup>th</sup> International Conference on Wind Turbine Noise 2015.
- “Wind Turbines and Health; A Critical Review of the Scientific Literature,” Journal of Occupational and Environmental Medicine 56(11) 2014.
- “The Massachusetts Research Study on Wind Turbine Acoustics - Methods and Goals,” Proceedings of NoiseCon14, Fort Lauderdale, Florida, 2014.
- “Prevalence of Complaints Related to Wind Turbine Noise in Northern New England,” Proceedings of Meetings on Acoustics, Vol 19, 2013
- “Improving Predictions of Wind Turbine Noise using PE Modeling,” Proceedings of the 2011 Conference of the Institute of Noise Control Engineers, NoiseCon 2011.
- “Calculating Annualized Sound Levels for a Wind Farm,” Proceeding of Meetings on Acoustics, Acoustical Society of America, Volume 9, 2010.

“Public Acceptance of Wind Energy:  
Impact of Sound Levels”  
– Acoustical Society of America, 2017.



- “Calibration Studies and Sound Modeling,” National Wind Coordinating Collaborative’s Seminar in State of the Art in Wind Siting, Washington, D.C., October 2009.
- “Propagation Modeling Parameters for Wind Power Projects,” Sound & Vibration Magazine, Vol. 24 no. 12, December 2008.
- “Sound Advice: Evaluating Noise Impacts in a Changing Landscape,” American Wind Energy Association Fall Symposium, November 2008.
- “Improving Sound Propagation Modeling for Wind Turbines,” Acoustics 08, Paris 2008.
- “Understanding Turbine Sound Impact Studies,” North American Windpower, May 2008.
- “Propagation Modeling Parameters for Wind Turbines,” Proceedings of the 2007 Conference of the Institute of Noise Control Engineers, NoiseCon 2007.
- “Assessing Wind Turbines using Relative Noise Standards,” Proceedings of the 2006 Congress of the International Institute of Noise Control Engineers, Internoise 2006.

RSG consultants have chaired technical sessions at several conferences on wind turbine noise, including Acoustics 08 in Paris, France, Internoise 2009 in Ottawa, Canada, the 2010 joint meeting of the Acoustical Society of America and the Institute of Noise Control Engineering in Baltimore, Maryland, and the 2011, 2014, 2015 and 2017 meetings of the Acoustical Society of America.

## 6.2 INTRODUCTION TO PROJECT STAFF

Staff that will be involved in this project include:



**Kenneth Kaliski, PE, INCE Bd. Cert.**, is a Senior Director at RSG. Ken is a licensed Professional Engineer in Vermont, New Hampshire, Massachusetts, Illinois, and Michigan, and is Board Certified through the Institute of Noise Control Engineering. He is the co-chair of the Wind Turbine Noise Technical Activity Committee of INCE and formally served as Vice

President of Board Certification and on the Board of Directors at INCE. He is also a member of the Acoustical Society of America where he serves on the Technical Committee on Noise. Ken is certified as a Qualified

Ken is co-chair of the Wind Turbine Noise Technical Activity Committee of INCE.

Environmental Professional through the Institute of Environmental Practice. Ken’s first wind energy project was a peer review of the “Boundary Lands” project in Maine in 1993, soon followed by preconstruction sound monitoring, modeling, and testimony for one of the first utility-scale wind projects in the United States, Searsburg Wind in Vermont. Since then, Ken has been involved in dozens of energy projects across the United States, including such projects as

- Sound modeling for Element Power’s Wildflower (wind and solar) in California,
- Public presentation for Iberdrola’s Dry Lake II project in Arizona,
- Wind ordinance reviews for DTE in Michigan,

- Sound modeling and public testimony for Berkshire Hathaway's Sugar Creek Wind in Illinois,
- Ohio Siting Board hearings for Scioto Ridge in Ohio,
- Permitting of GMP's Kingdom Community Wind in Vermont,
- Postconstruction sound monitoring for Patriot's Spruce Mountain Wind project in Maine, and
- Project manager for the Cassadaga and Baron Wind projects currently undergoing Article 10 review in New York.

Ken has also taken a lead role in research on wind turbines, with more than a dozen papers on the subject. His research includes the "Massachusetts Study on Wind Turbine Acoustics" for the Massachusetts Clean Energy Center and Department of Environmental Protection and an ongoing study with the Lawrence Berkeley National Laboratory on wind turbine public acceptance. He also published several papers sound on propagation modeling for wind projects.



**Eddie Duncan, INCE Bd. Cert.**, is a Director at RSG. He is Board Certified through the Institute of Noise Control Engineering and is a member of the Acoustical Society of America where he serves on the Technical Committee on Architectural Acoustics. He presented a paper at the 2015 Wind Turbine Noise Conference in Glasgow, Scotland titled, "Methods for Assessing Background Sound Levels during Post-Construction Compliance Monitoring within a Community." In February 2016, he presented at the Energy, Utility, & Environment Conference (EUEC) a paper titled, "Understanding Noise Complaints from Relatively Low-Noise Utility Projects." One of Eddie's first wind projects was Iberdrola's Hays projects in Kansas, where he worked with Ken on preconstruction sound monitoring, experiments to calibration the sound propagation model for wind turbine noise, and modeling. He has since managed many wind projects across the United States, including Pisgah Mountain Wind in Maine, Crocker Wind and Cattle Ridge in South Dakota, and Northwest Ohio Wind in Ohio. He also managed the Blazing Star I and II projects in Minnesota where RSG recently received positive feedback from the state that they appreciate how clear and comprehensive our reports are compared to others that they have seen.



**Isaac Old** is a Consultant at RSG. He manages and provides technical support on wind and solar projects. He is a member of the Institute of Noise Control Engineering and Acoustical Society of America. Isaac has been measuring, analyzing, and modeling sound from wind power projects for over seven years at projects across the country. As a key member of our team, he works to develop advanced data analysis tools. He is lead author of the paper, "Wind Turbine Noise Dose Response – Comparison of Recent Papers," which he presented at the 2017 Wind Turbine Noise Conference in Rotterdam, the Netherlands. He is an expert of

deploying sound monitors in remote locations throughout the United States, including Ohio, South Dakota, Michigan, Illinois, Vermont, and Maine (among others). In addition, Isaac conducts sound propagation modeling for such projects as Champlin/GEI Wind Holdings project in Hawaii, Blazing Star in Minnesota, and Dairy Air Wind in Vermont. He manages preconstruction noise studies for solar projects, including Grand Isle Solar, Stafford Hill Solar, and Otter Creek Solar in Vermont.



**Ryan Haac** is a Senior Analyst at RSG. He is an associate member of the Institute of Noise Control Engineering and the Acoustical Society of America. Ryan specializes in the deployment of monitoring hardware and modeling, with a penchant for reliability and quality. He is co-author of the research paper, "Public Acceptance of Wind Energy: Impact of Sound Levels," which he presented at the 174th Meeting of the Acoustical Society of America in December 2017. Ryan is also involved in pre- and post-construction noise studies for wind and solar projects. He sets up monitoring systems in both easy and challenging environments like remote mountains in Maine.







55 Railroad Row  
White River Junction, VT 05001  
802.295.4999  
[www.rsginc.com](http://www.rsginc.com)



White River Junction &  
Burlington, VT



Arlington, VA



Chicago, IL



Evansville, IN



Portland, OR



Salt Lake City, UT



San Diego, CA

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# **CIANBRO**

PROPOSAL SUBMITTED TO:  
**SWEB**

**SILVER MAPLE WINDFARM**  
CIANBRO QUALIFICATIONS PACKAGE

SUBMITTED ON 5.22.19

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**SECTION 1**  
**QUALIFICATIONS SHEET**

**CIANBRO**

# Introduction

## History

With more than 70 years of history, Cianbro has safely and efficiently planned, managed, and constructed many technically complex, historic, and environmentally sensitive projects for a wide variety of public and private clients.

A total commitment to safety combined with the enthusiasm of an innovative team of construction professionals, has enabled Cianbro to build a durable reputation for completing projects safely, on schedule, and within budget.

Founded in 1949 by the Cianchette Brothers, Cianbro is now one of the United States' largest, most diverse, successful, open shop, 100% employee-owned construction companies, presently operating in more than 40 states, five markets, and employing over 4,000 team members.

## Geography

Cianbro's service territory spans the entire United States - from the North East to the Pacific Region. Each geographic location is comprised of offices, enclosed shops, and equipment yards, in addition to fabrication and coating as well as deepwater marine and modular manufacturing facilities.

## Open Shop

Cianbro is an open shop / merit shop contractor, and is therefore not signatory to any national or local labor agreements. Teamwork, dedication, and personal sacrifice are what differentiate Cianbro from its competitors. Cianbro applies its can-do spirit in the workplace every day, implementing innovative and creative solutions for client's needs on a wide variety of projects.

## Employee-Owned

Cianbro is 100% employee-owned by team member participation in the Profit Sharing Plan, facilitated by the Employee Stock Ownership Plan (ESOP). Each team member shares in the risk and profits of business. As owners, team members work more safely, efficiently, and productively to ensure the successful completion of each project.

## Construction Services

With over 4,000 team members, Cianbro provides Construction Services from the conceptual stages of design through implementation, to start-up, commissioning, and turn-key operations. Self-performing Civil, Structural, Mechanical, Electrical, Instrumentation, Fabrication, and Coating, in five different markets, under various contractual means and several different contracting roles, Cianbro's overall objective is to ensure each project is completed on schedule and within budget.

# Construction Services: *Wind Energy Services*

Cianbro's Wind Energy Services (WES) has experience in project development, pre-construction activities, EPC construction, and maintenance services.

Cianbro's unique strengths are centered on self-perform capabilities in all aspects of onshore and offshore wind farm construction, including site civil, structural, erection, and electrical, including substation transmission and collection.

Cianbro provides the following WES safely, on time, and on budget for a variety of clients, such as developers, energy providers, and private owners:

## Self-Perform

Project Management  
Environmental, Health & Safety  
Quality Assurance / Quality Control  
Procurement  
Construction Design  
Foundations  
Turbine Erection  
Turbine Down Tower Wiring  
Collection, Substation & Transmission  
Operations & Maintenance Building

## Resources

Project Managers	41
Project / Field Engineers	95
Superintendents / General Foremen	104
Civil Workers	177
Ironworkers	172
Crane Operators	70
Millwrights	110
Electricians	124
Transmission & Distribution Workers	115

## Preconstruction Services

- Engineering
- Permit Support
- Constructability Reviews
- Budget & Schedule Development

## EPC Services

- Site Civil, Foundation & Electrical Interconnect Engineering
- Site Development, Foundation Installation, Turbine Erection, Electrical Collection, Substation & Transmission Construction
- Commissioning & Start Up

## Maintenance

- Turbine / OEM Support Services
- BOP Maintenance

## Subcontract

Site Civil Design  
Structural Foundation Design  
Electrical Design  
Sitetwork  
Turbine Transport

## 4,000 Team Members

# Transmission, Substation & Construction Services: *Distribution*

Cianbro has more than 70 years of construction experience, with nearly a decade within this industry. Cianbro provides custom-tailored construction, construction management (CM) design-build (DB), engineer, procure, construct (EPC), and maintenance services for electrical transmission, substation, and distribution, as well as telecommunications and fiber and lighting projects.

Cianbro has successfully completed transmission line construction in challenging environments, ranging from the rugged New England terrain to portions of the heavily-traveled corridors in the Mid-Atlantic.

Cianbro has a proven track record of completing utility projects on time and has met the in-service date requirements on all of the projects we have undertaken, including the following:

Catenary Communications	Renewable Energy
Storm Restoration	
High Voltage Industrial	Submarine Cable
Maintenance	

## Scope of Services

Construction

Construction Management

Design-Build

Engineer, Procure, Construct

Maintenance

Transmission Experience

Aerial

Cable

Fiber Optics (OPGW)

Live Line

Substation Experience

Civil

Steel Fabrication & Erection Services

Electrical

## Specialized Transmission Equipment

Off-Road Haulers

Road Tractors

Box Drop Deck Trailer

Low Bed Trailer: 35 to 50 Tons

Aerial Bucket Truck: 50 to 55 Foot Reach

Digger Derrick Truck

Mat Handler Aerial Lift: 55 to 120 Foot Track

Digger Derrick Tracked

Dump Carrier Tracked

FlexTrack Vehicle

Tracked Trailer

Wire Trailer

Rope Tensioner Trailer

Puller / Tensioner Trailer

Three Reel Trailer

Boom Trucks: 8 to 23 Tons

Pole Transport Trailer

Bulldozer

Excavators

Rough Terrain & Carry Deck Cranes

# EQUIPMENT RESOURCES

CIANBRO IS PREPARED FOR  
**RAPID MOBILIZATION**

CIANBRO OWNS AN EQUIPMENT FLEET  
CONSISTING OF APPROXIMATELY **3,500 PIECES**  
AND VALUED AT NEARLY **\$150 MILLION**

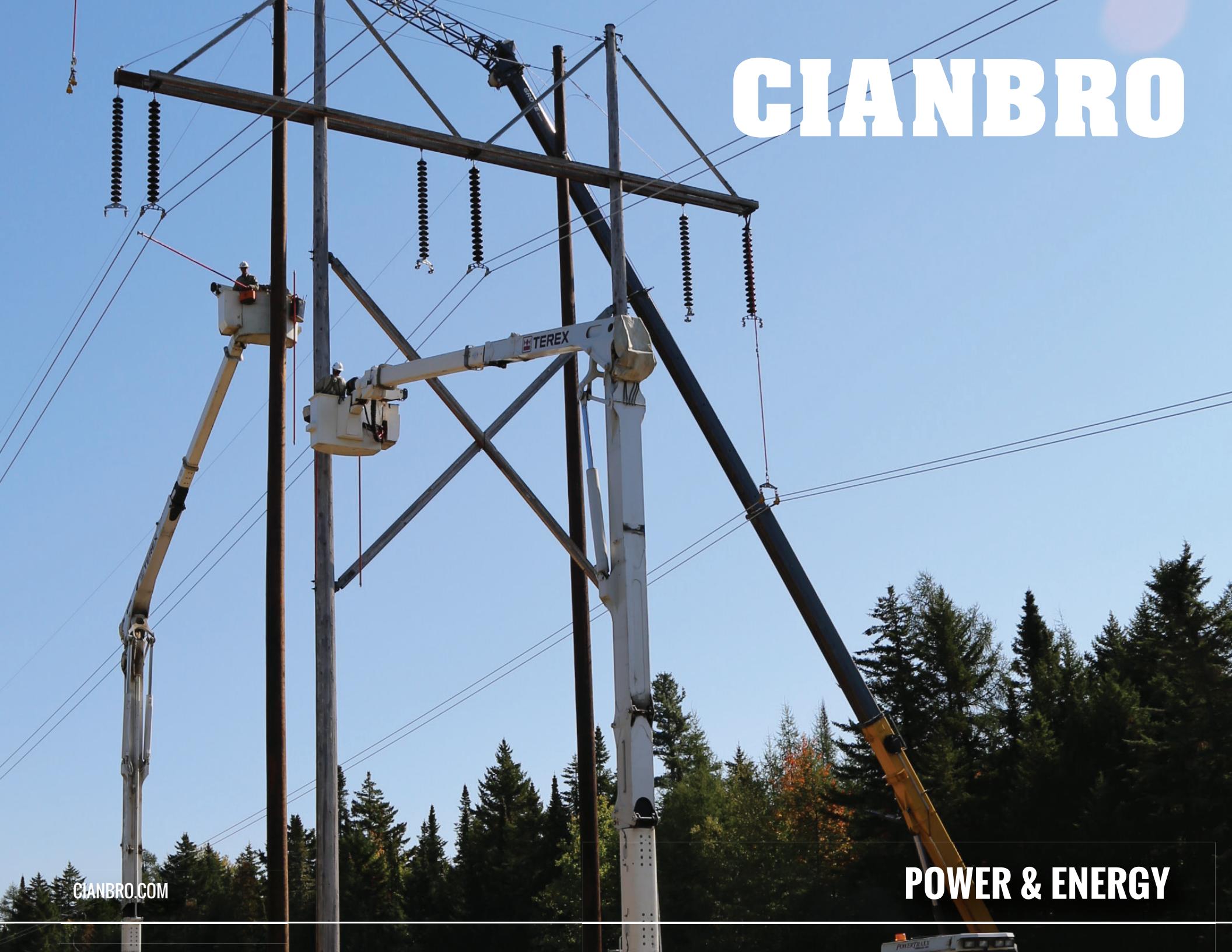


## POWER & ENERGY CONSTRUCTION EQUIPMENT

- 47** Crew Cab Pickup Trucks
- 14** Crew Cab T&D Flatbed Trucks
- 9** T&D Line Trucks
- 28** Utility Side-By-Sides, 4 x 4
- 12** Road Tractors
- 5** Lowbed Trailers: 30 - 55 Ton
- 22** Aerial Bucket Line Trucks
- 4** Digger/Derrick Trucks
- 4** Hydremas: Artic Dump Trucks
- 7** Tracked Material Handlers/Aerial Lifts
- 50** Aerial Personnel Lifts
- 5** Tracked Digger/Derricks
- 9** Tracked Dump Carriers
- 13** Reel Trailers
- 9** Reel Stands
- 7** Puller/Tensioner Trailers: V-Groove, Bull Wheels, Condux
- 5** Pole Trailers
- 4** Mulcher Trailers: (1)Trailer, (3)Skid
- 24** Storage Trailers: 6 ft x 10 ft - 34 ft
- 5** Four Drum Rope Pullers
- 5** Bulldozers: 15,000+ lbs
- 27** Extended Boom Forklifts
- 27** Excavator: 1/3- 2 1/2 Yard
- 26** Excavator Attachments: (1)Mulcher, (5) Auger, (13)Hoe-Ram (1)Pipe Grapple, (1) Clam Bucket, (1)Ripper Tooth, (2)Vibro Hammer, (3)Pintle Hitch Attach
- 19** Boom Trucks: 14- 30 Ton
- 18** Loaders: 3 Cubic Yards +
- 27** Rough Terrain Cranes: 18 - 130 Ton
- 12** Skid Steer Loaders
- 1** Tailgate Mulchers
- 1** Pulp Truck
- 2** Hotstick Trailers
- 22** Tag Trailers
- 2** Tracked Trailers

**CIANBRO**

# CIANBRO



CIANBRO.COM

POWER & ENERGY



**EXCELLENCE IN  
ENVIRONMENTAL STEWARDSHIP**



Safety is a Cianbro Core Value



Committed to Quality Workmanship

## MARKETS SERVED | Transmission & Distribution | Substation | Wind | Solar

### ENVIRONMENTAL, HEALTH, SAFETY & QUALITY

Cianbro is committed to identifying areas of environmental concern and working proactively to minimize the impacts of construction activities on environmental resources. Cianbro utilizes Best Management Practices and has policies in place to minimize environmental impacts and maintain compliance with applicable regulations, while efficiently and effectively fulfilling contract requirements.

Recognized as a national leader in workplace health and safety, Cianbro's number one value is our commitment to safety. Cianbro believes a team well-educated in health and safety is key to eliminating risks, improving quality, and achieving outstanding productivity. Our management team has developed a comprehensive safety program that encourages team members at every level to actively discuss and help improve safety in the workplace.

Cianbro strives to build it right the first time, safely, within budget and on schedule. We do this by utilizing our Quality Assurance/Quality Control programs based on ISO-9001.





Distribution Circuits

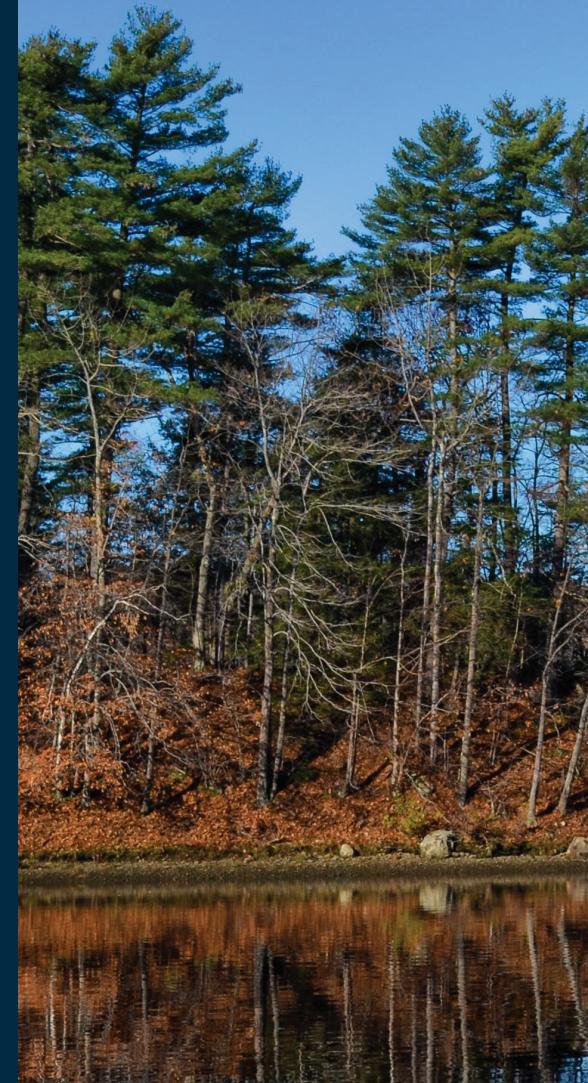


Transmission Inspection & Construction

Cianbro's experience includes setting and framing all structure types including wood, steel and lattice towers, single and bundled conductor, static wire, and OPGW installation for rebuilds or Greenfield lines up to and including 345 kV.

## SERVICES

- Clearing
- Access, Matting & Environmental Controls
- Material Procurement & Management
- Structure Installation
- Conductor & OPGW
- Energized Structure Replacement
- Storm Restoration





DELIVERING COMPLEX PROJECTS  
SAFELY AND SUCCESSFULLY

# SUBSTATION

Cianbro has extensive experience constructing both Greenfield substations and upgrades to existing, energized facilities, with voltages ranging from 12.47 kV to 500 kV.

## SERVICES

- STATCOM
- Structural
- Civil
- Security
- SVC
- Protection & Controls
- Electrical
- EPC
- GIS
- Aluminum Bus Welding
- Mechanical

## SUBSTATION SECURITY SERVICES

Cianbro offers above and below-grade installation, and all civil and electrical work associated with the installation of fence and security systems while working closely with security integration contractors through testing and commissioning.

- Manual & Motor Operated Gates
- Motion & Noise Detection Systems
- Camera & Card Reader Systems
- All Types of Steel & Concrete Physical Hardening Systems
- Lighting Upgrades



Tap Installation



Experience Assembling all Types of Security Fence Systems





EXCELLENCE  
IN CONSTRUCTION

# THE QUEST FOR CONTINUOUS IMPROVEMENT





Ridge Top Site Development



In-House Equipment Resources

## WIND POWER

Cianbro provides a cost-effective and efficient delivery model, centered on our unique strengths to self-perform all aspects of onshore wind farm construction including project development, pre-construction, construction, EPC construction and maintenance services.

### SERVICES

#### Pre-Construction

- Engineering
- Permit Support
- Constructability Reviews
- Budget Development
- Schedule Development

#### Construction

- Site / Civil
- Foundations
- Turbine Transport & Erection
- Electrical Collection
- Substation & Transmission Construction
- Commissioning & Start-Up
- Windfarm Maintenance - BOP & OEM Services

#### Offshore

- Substation Fabrication
- Substation Construction
- Substation Deployment

# EXCEEDING EXPECTATIONS SINCE 1949



Turn-Key EPC Services



Solar Farm Development, Management & Construction



---

## SOLAR ☀

Cianbro has experience in the development and construction of solar projects. Our expertise and depth of resources in the electrical and civil markets, provides us the ability to manage and deliver fully operational power generation facilities to our customers.

### SERVICES

- Site Work & Foundations
- Underground Cable System Installation
- Power Grid Interconnect Upgrades
- Photovoltaic Equipment Installation
- Racking Systems
- Electrical & Instrumentation Installations
- Fiber Optics

# WORKFORCE DEVELOPMENT



The Cianbro Institute provides recruiting, hiring and both craft and professional development opportunities. The Cianbro Institute has full-time instructors dedicated to developing team members including accredited apprenticeship programs and partnerships with external organizations. Cianbro provides a highly qualified and dedicated workforce skilled in multiple craft and professional trades in various aspects of construction, maximizing productivity and allowing us to quickly adapt to our client's needs.

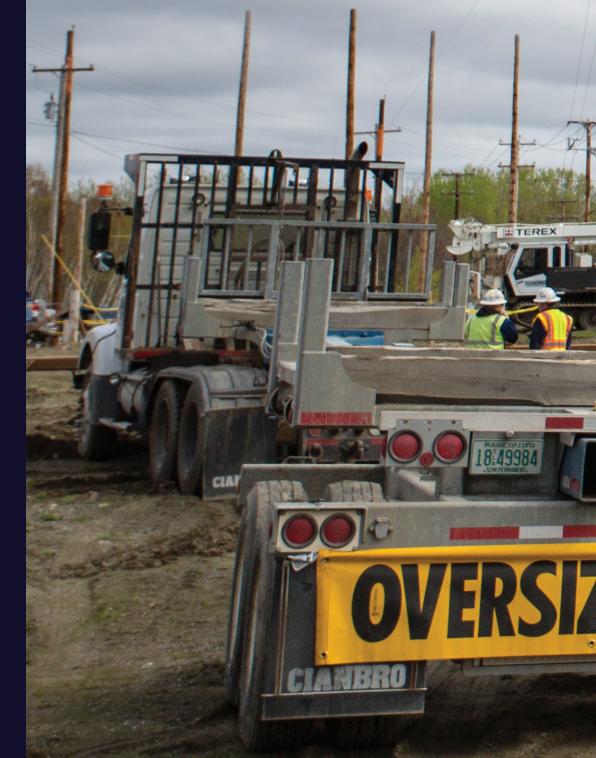
The Cianbro Institute has a workforce development center where instructors and team members are able to replicate practical applications and develop skills in all aspects of the work addressing terrain, voltage, access, equipment operation, and construction means and methods.



Mock Substation at Workforce Development Yard



Certified Welding Program





HANDS-ON  
EXPERIENCE

# 100% EMPLOYEE OWNED

FOUNDED IN  
1949  
CIANCHETTE BROTHERS

# 4,000 TEAM MEMBERS



## ABOUT US

Since 1949, Cianbro has safely and efficiently planned, managed, and constructed many technically complex, historic, and environmentally sensitive projects for a wide variety of clients. A focused and sustained commitment to safety permeates the entire Cianbro organizational culture and represents the foundation of our company's guiding principles. Cianbro team members reflect a "can do" spirit of cooperation, enthusiasm, and concern for the client, which is something Cianbro considers to be unmatched in the construction industry and has enabled Cianbro to build a durable reputation for completing projects safely, on schedule, and within budget.



# MARKETS



# 5

BUILDING  
INDUSTRIAL & MANUFACTURING  
INFRASTRUCTURE  
OIL, GAS & CHEMICAL  
POWER & ENERGY

## SELF PERFORMING

## GENERAL CONTRACTOR



CIVIL  
STRUCTURAL  
MECHANICAL  
ELECTRICAL  
INSTRUMENTATION  
FABRICATION  
COATING

CORPORATE PITTSTFIELD MAINE

OPERATING IN MORE THAN  
**40** STATES



LOCATIONS

# #1 SAFETY

OSHA SAFETY & HEALTH ACHIEVEMENT RECOGNITION PROGRAM (SHARP)  
CIANBRO ACCIDENT PREVENTION PROCESS  
JOURNEY BEYOND ZERO  
STAR MOBILE WORKFORCE VPP: REGION ONE - OSHA  
HEALTHIEST & SAFEST COMPANY IN AMERICA - ACOEM  
WELLNESS PROGRAM BEST IN UNITED STATES - WELCOA

## EQUIPMENT

Cianbro owns an equipment fleet consisting of approximately 3,500 pieces. Cianbro has complete control over its operation, having the ability to prioritize needs to assure the proper equipment is available where it is required the most. Cianbro is prepared for rapid mobilization.



## CONTACT

POWERENERGY@CIANBRO.COM

207.487.3311

[.com](#) [f](#) [g+](#) [in](#) [iagram](#) [tweeter](#) [youtub](#)



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**EEI**  
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**SECTION 2**  
REFERENCE PROJECTS

**CIANBRO**

**OWNER**

Withheld Upon Owner Request

**MARKET**

Power & Energy

**LOCATION**

Pennsylvania

**ORIGINAL CONTRACT VALUE**

Withheld Upon Owner Request

**ORIGINAL START DATE**

May 2017

**START DATE**

May 2017

**ORIGINAL COMPLETE DATE**

October 2019

**OWNER'S REPRESENTATIVE**

Jeff Nelson

P.Eng | Manager, Project Engineering  
TRANSALTA CORPORATION

+1 (403)-267-7451

+1 (403)-604-5260

## BIG LEVEL WIND

### SCOPE OF WORK

Cianbro is the EPC contractor for the BOP services contract for the 90 MW Big Level Wind project. The scope consists of the site work and access development, foundation, erection of 26, GE 3.X turbines with a 131 meter hub height, underground collection, overhead collection, a collection substation, an interconnect substation, O&M Building, as well as a permanent MET Tower.

### PROJECT DETAILS

- Construct approximately nine miles of access roads, crane roads, and turbine pads
- Construct 26 gravity foundations at approximately 650 cubic yards each
- Install nineteen 3.6 MW wind turbines at 131.4 meter hub height by 137 meter rotor diameter
- Install seven 3.6 MW wind turbines at 110 meter hub height by 137 meter rotor diameter
- Install approximately 45,000 linear feet of underground collection
- Install approximately two miles of double circuit and 1.5 miles of single circuit overhead collection
- Construct collection substation
- Construct three-breaker ring bus interconnection switchyard
- Construct an O&M building and 140 meter MET tower

### LEAN, INNOVATIVE, AND UNIQUE PROJECT SOLUTIONS

The Big Level Wind project will be constructed following stringent environmental requirements as the site is located among "high value" streams. Additionally, Cianbro will be installing and erecting North America's tallest turbine with a hub height of 130 meters.

**OWNER**

Pisgah Mountain, LLC

**ARCHITECT/ENGINEER**

Barr Engineering  
RLC Engineering  
Sebago Technics, Inc.

**MARKET**

Power & Energy

**LOCATION**

Clifton, ME

**ORIGINAL CONTRACT VALUE**

Withheld Upon Owner Request

**CONTRACT VALUE**

Withheld Upon Owner Request

**START DATE**

December 2015

**COMPLETE DATE**

December 2016

**OWNER'S REPRESENTATIVE**

Toby Hall  
Construction Manager  
SWEB  
6080 Young Street, Suite 106  
Halifax, NS B3K 5L2  
902-431-0564 ext. 251  
toby.hall@swebdevelopment.ca

## PISGAH MOUNTAIN WIND ENERGY

**SCOPE OF WORK**

Cianbro was the EPC contractor for the Pisgah Mountain Wind Energy project. The engineering, procurement, and construction scope of work consisted of the site development, including access roads and turbine sites, coordination of the transportation of the turbines from the port to the site, erection of five 1.8 MW Vestas V90 wind turbines, underground collection, overhead collection, and a complete collection substation.

**PROJECT DETAILS**

- Constructed 3 miles of access roads, 1 mile of crane roads, and 5 WTG pad sites
- Constructed 5 gravity foundations at 450 cubic yards each
- Erected five, 1.8 MW Vestas V90 wind turbines, at a 95M hub height, including down tower electrical
- Installed approximately 6500 linear feet of underground collection
- Installed approximately 1700 linear feet of overhead line construction
- Performed site development for substation and all below-grade electrical (grounding and conduit)
- Erected associated substation steel structures
- Installed substation bus and tap
- Procured, delivered, dress filled, and tested main transformer
- Installed prefabricated control building
- Installed and terminated all yard P&C cable
- Tested, commissioned, and turned over a complete operational facility

**LEAN, INNOVATIVE, AND UNIQUE PROJECT SOLUTIONS**

Cianbro engaged and supported the developer 5 years before the engineering and construction phase of the project. Delayed completion of the development cycle put the critical completion milestone in jeopardy. Due to Cianbro's early engagement, we were able to expedite the critical path electrical engineering and long lead electrical component procurement. This ensured that the project would meet the interconnect dates and the desired COD. Simultaneously, our site design team worked with the owner's permitting engineer to meet the restrictive permit requirements.



## PASSADUMKEAG WINDPARK

### SCOPE OF WORK

Cianbro provided complete engineering, procurement and construction (EPC) services for the 40 MW wind farm.

### PROJECT DETAILS

- Completed 6.5 miles of access roads including, 500,000 cubic yards of excavation
- Placed 13 WTG foundations, including 260 rock anchors
- Transported over-width/over-weight turbine components from Searsport, Maine to the project site
- Installed 13 Vestas V-112 turbines, including all erection, down-tower electrical, mechanical alignment, and commissioning support
- Placed five miles of underground collector line, including communications and grounding
- Placed 18 miles of overhead collector line, including nine miles of new overbuild for the existing utility, and nine miles of new cross country transmission and communication
- Installed D-VAR system to ensure power quality at the grid connection to the 34.5kV collection substation
- Constructed a 115kV switchyard, as well as performed 115kV transmission line tie-in and related outage coordination
- Constructed an O&M building with station service, communications, oil storage, and security, and erected a permanent MET tower and related instrumentation
- Managed the commissioning of the entire generation facility

### LEAN, INNOVATIVE, AND UNIQUE PROJECT SOLUTIONS

In order to overcome the project's environmental permit delays, Cianbro developed multiple start date scenarios with limited engineering expenditures and a compressed construction schedule to preserve the project completion date while limiting the client's cost exposure.

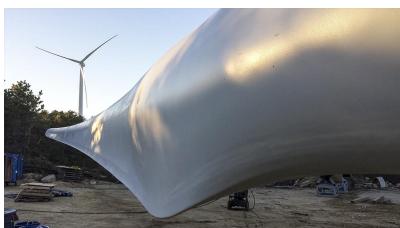
### AWARDS

2016 ENR New England Best Projects Merit Award

[VIDEO: Passadumkeag Wind Project Completed](#)



DEDICATED TO AN INJURY-FREE WORKPLACE

**OWNER**

United States Air Force

**ARCHITECT/ENGINEER**

STV Incorporated

**MARKET**

Power & Energy

**LOCATION**

Bourne, MA

**CONTRACT VALUE**

\$1,100,000.00

**COMPLETE DATE**

September 2013

**OWNER'S REPRESENTATIVE**

Ray Francisco

Environmental Chemical Corporation

33 Boston Post Road, Suite 420

Marlborough, MA 01752

508-229-2270

RFrancisco@ecc.net

## WIND TURBINE FOUNDATION & ERECTION

### SCOPE OF WORK

Cianbro installed foundations and erected two, 1.68 MW GE wind turbines near the PAVE (Precision Avionics Vectoring Equipment) PAWS (Phased Array Warning System), at a Massachusetts Military Reservation.

### PROJECT DETAILS

- Installed two, 56 feet octagonal concrete gravity foundations which included placing a concrete mud slab, along with installing 80 tons of reinforcing steel with two anchor bolt rings, as well as placing 850 cubic yards of total concrete
- Off-loaded two, 1.68 MW GE wind turbines that each included 80 meter towers, a hub, blades, and a nacelle
- Erected three tower sections
- Assembled the hub and blades on the ground then erected the hub/rotor assembly as one lift to the already erected nacelle

### LEAN, INNOVATIVE, AND UNIQUE PROJECT SOLUTIONS

The project site is located within an active military base, and was constructed during peak tourist season on Cape Cod. To minimize the project's footprint, each site had minimal space for laydown and installation activities, requiring precise coordination with transportation for all major components.

**OWNER**

Georgia Mountain Community Wind,  
LLC

**ARCHITECT/ENGINEER**

Barr Engineering  
Cross Consulting Engineering  
RLC Engineering  
VERA Renewables

**MARKET**

Power & Energy

**LOCATION**

Milton, VT

**ORIGINAL CONTRACT VALUE**

\$7,290,040.00

**CONTRACT VALUE**

\$8,700,000.00

**COMPLETE DATE**

December 2012

**OWNER'S REPRESENTATIVE**

Martha Staskus  
Vermont Environmental Research  
Associates, Inc. (VERA)  
1209 Harvey Farm Road  
Waterbury Center, VT 05677  
802-244-7522  
802-244-1857  
marthas@northeastwind.com

ZERO LOST-TIME INJURIES

## GEORGIA MOUNTAIN WIND PROJECT

### SCOPE OF WORK

Cianbro provided EPC services to complete a 10 MW wind project with four 2.5 MW direct drive Goldwind America wind turbines in the mountains of Vermont.

### PROJECT DETAILS

- Managed site preparation including 100,000 cubic yards of rock excavation
- Placed four 30 feet diameter heavily reinforced concrete foundations anchored with 3 inch diameter 45 feet long rock anchors
- Constructed Turbine Transport Roadways with 20% grades
- Erected four 2.5 MW, 80 meter hub height direct drive wind turbines including all downtime wiring and mechanical completion
- Installed four 2.75 MVA transformers (34.5 kV to 690 volt)
- Installed 3,600 linear feet of 34.5 kV Underground Collection
- Installed 1.5 miles of 34.5 kV Overhead Collection
- Installed a complete fiber optic SCADA system

### LEAN, INNOVATIVE, AND UNIQUE PROJECT SOLUTIONS

Cianbro provided engineering and construction services for this turnkey project. Cianbro worked with the Owner's permitting and engineering teams in early spring to advance the design and release long lead equipment to meet the aggressive schedule. The entire project team overcame turbine delivery obstacles in order to maintain the original in-service schedule. Significant public outreach and accommodation of local needs facilitated a smooth project execution ultimately leading to the wind turbines erection and successful commissioning of the project before year-end to achieve the Commercial Operation Date Milestone.





<b>OWNER</b> ECO Industries, LLC	<b>ARCHITECT/ENGINEER</b> Barr Engineering RLC Engineering	<b>MARKET</b> Power & Energy	<b>LOCATION</b> Woodstock, ME	<b>ORIGINAL CONTRACT VALUE</b> Withheld Upon Owner Request	<b>CONTRACT VALUE</b> Withheld Upon Owner Request	<b>COMPLETE DATE</b> December 2011	<b>OWNER'S REPRESENTATIVE</b> Will Spielvogel, COO Jay Cashman, Inc PO Box 692396 Quincy, MA 05569 617-890-0600 617-890-0606 wspielvogel@jaycashman.com
<p>“...was the fastest ridgeline project completed to date in the State of Maine...was especially impressed by your company’s safety procedures and attention to quality control and assurance...a partnership embracing clear communication and endless cooperation...” - Will Spielvogel, COO Jay Cashman Inc.</p>							

## SPRUCE MOUNTAIN WIND PROJECT

### SCOPE OF WORK

Cianbro erected a 20 MW wind project with 10, 2 MW Gamesa wind turbines.

### PROJECT DETAILS

- Installed 10 rock anchor foundations
- Provided all offloading, erection and down tower wiring services
- Installed 7,000 feet of overhead transmission lines
- Installed 7,000 feet of overhead distribution lines
- Installed 2 miles of underground collection power lines and fiber network
- Performed operations and maintenance
- Constructed O&M Building

### LEAN, INNOVATIVE, AND UNIQUE PROJECT SOLUTIONS

This ridgeline wind farm project was constructed on an accelerated schedule in which construction began in August and was commissioned / operating by December. Cianbro was selected by the Owner as a result of our self-perform capabilities on all aspects of the work and providing our client with collaboration and schedule certainty to avoid winter conditions.

**OWNER**

Withheld Upon Owner Request

**MARKET**

Power & Energy

**LOCATION**

Maryland

**ORIGINAL CONTRACT VALUE**

Withheld Upon Owner Request

**CONTRACT VALUE**

Withheld Upon Owner Request

**COMPLETE DATE**

December 2010

**OWNER'S REPRESENTATIVE**

Withheld Upon Owner Request

Personnel received special training in high angle rescue operations

## WIND PARK WIND TURBINE GENERATOR ERECTION

### SCOPE OF WORK

Under contract to the Wind Turbine Generator OEM, Cianbro erected (2.5 MW) turbines for a Wind Park in Maryland. All turbine materials were supplied by the OEM.

### PROJECT DETAILS

- Erected 20 turbines with a hub height of 262 feet. Each unit was comprised of:
  - Four (4) tower sections
  - Three (3) blades, 144 feet long each
  - One (1) 105 ton nacelle
- Prepared the nacelle for installation including generator installation and alignment
- Prepared towers for erection including installation of electrical cabinets
- Routed and connected generator power and communication cabling
- Provided engineered rigging plans developed by Cianbro's internal Construction Engineering group

### LEAN, INNOVATIVE, AND UNIQUE PROJECT SOLUTIONS

The team coordinated the receipt of components from Germany, Arkansas, Tennessee and Iowa to erect towers on a just-in-time basis. The project overcame severe winter conditions for a successful completion.



## FOX ISLANDS WIND PROJECT

### SCOPE OF WORK

Cianbro constructed three, GE 1.5 MW wind turbines in the town of Vinalhaven, located on Vinalhaven Island, Maine.

### PROJECT DETAILS

- Provided support to the owner through permitting, engineering and procurement of the turbines
- Cleared the site
- Constructed the site road
- Placed the concrete foundations
- Erected three, GE 1.5 MW wind turbines, including tower sections, nacelle, hub, and blades
- Installed the collection and interconnect system
- Installed the SCADA and communications system

### LEAN, INNOVATIVE, AND UNIQUE PROJECT SOLUTIONS

Cianbro constructed the wind turbines on Vinalhaven Island approximately 12 miles off the coast of Maine. The location of the project required all construction materials and equipment to be barged to the island. In order to transport the 18 erection crane loads, 27 turbine loads, 30 concrete loads, and all the construction material and equipment to the project site requires precise logistics, including; scheduling and coordination with the owner, vendors, and transportation companies to ensure all material is transported in the most cost effective and safest way possible. Due to the size of Vinalhaven Island and how its economy depends on fishing and summer tourism, Cianbro worked closely with the community to mitigate any impacts that arose as it related to the project.

**OWNER**  
Fox Islands Wind, LLC

**ARCHITECT/ENGINEER**  
EOS Ventures, LLC  
RLC Engineering  
Sebago Technics, Inc.

**MARKET**  
Power & Energy

**LOCATION**  
Vinalhaven, ME

**ORIGINAL CONTRACT VALUE**  
Withheld Upon Owner Request

**CONTRACT VALUE**  
Withheld Upon Owner Request

**COMPLETE DATE**  
October 2009

**OWNER'S REPRESENTATIVE**  
George Baker  
CEO  
Fox Islands Wind, LLC  
66 Main Street  
Vinalhaven, ME 04863  
207-863-4900  
207-863-4526  
gbaker@hbs.edu

**SECTION 3**  
CLIENT REFERENCES

**CIANBRO**

## SECTION 3

### CLIENT REFERENCES

#### **GAMESA**

Eric Gagnon  
Construction Project Manager  
1150 Northbrook Drive, Suite 150  
Feasterville, Trevose, PA 19053-8409  
215-375-2014  
[egagnon@gamesacorp.com](mailto:egagnon@gamesacorp.com)

#### **QUANTUM**

Suriyun Sukduang  
Vice President  
1401 McKinney Street, Suite 1800  
Houston, TX 77010  
713-485-8658  
[SSukduang@quantumug.com](mailto:SSukduang@quantumug.com)

#### **SWEB DEVELOPMENT LP**

Paul Fuller  
Director  
6080 Young Street, Suite 106  
Halifax, Nova Scotia, B3K 5L2  
1-902-431-0564  
[paul.fuller@swebdevelopment.ca](mailto:paul.fuller@swebdevelopment.ca)

#### **SWEB DEVELOPMENT LP**

Toby A. Hall  
Director of Construction, SWEB Development  
6080 Young Street, Suite 106  
Halifax, Nova Scotia, B3K 5L2  
t (902) 431-0564 ext 251  
c (902) 818-4559  
[toby.hall@swebdevelopment.ca](mailto:toby.hall@swebdevelopment.ca)

#### **WALDEN GREEN ENERGY**

Jack Kenworthy  
Director  
155 Fleet Street  
Portsmouth, NH 03801  
w: 603.570.4842  
c: 484.467.5315  
[www.waldengreenenergy.com](http://www.waldengreenenergy.com)

**SECTION 4**  
**RESUMES**

**CIANBRO**

## CHARLES S. ALLEN | PROJECT MANAGER

### 15 YEARS OF EXPERIENCE

Chad has 14 years of experience working with Cianbro in the Power & Energy market. Chad has worked in various capacities executing multiple levels of organization and strategy, is knowledgeable and experienced as a project engineer, estimator, and project manager. Chad is responsible for developing cost-competitive project execution strategies, and resulting scope, cost and schedule. Chad also identifies project challenges and risks while developing corresponding mitigation strategies. In addition, he identifies project and customer opportunities while expanding vendor and subcontractor relationships.

#### EDUCATION

B.S. Chemical Engineering, University of Maine; Orono, ME

#### CERTIFICATIONS

OSHA 30 Hour | Construction  
Quality Management | Leading  
with Safety Management

### PROJECT EXPERIENCE

#### NORDEX ROTH ROCK WIND PROJECT - MARYLAND

Cianbro, under contract to the Wind Turbine Generator OEM, erected 20 ea. 2.5MW turbines for a wind park in Maryland. Each unit was comprised of four tower sections, three blades 144 feet long each, and one 105 ton nacelle.

#### TRANSCANADA KIBBY WIND FARM - FRANKLIN COUNTY, ME

Cianbro constructed a 27.6 mile 115 kV transmission line from Kibby Township to Central Maine Power Company's Bigelow Substation.

#### FOX ISLANDS WIND PROJECT - VINALHAVEN, ME

Cianbro constructed three, GE 1.5 MW wind turbines in the town of Vinalhaven, located on Vinalhaven Island in Maine.

#### ECO INDUSTRIES, LLC SPRUCE MOUNTAIN WIND PROJECT - WOODSTOCK, ME

Cianbro erected a 20 MW wind project with 10 ea. 2 MW Gamesa wind turbines.

### EXPERIENCE PRIOR TO CIANBRO

- Development Engineer – Metso Paper; Karlstad, Sweden
- Technical Specialist – Metso Paper; Various Locations – North America/Europe

### CORE RESPONSIBILITIES

- Point of contact for the project team and will be in direct contact with the client
- Leads the project team in regards to business aspects of the job to ensure all safety, customer, production, quality, financial and company objectives are met, and coordinates resources as needed

### OTHER NOTABLE PROJECTS

- Passadumkeag Wind Project Preconstruction Services
- Pave Paws Wind Project Preconstruction Services
- Georgia Mountain Wind Project Preconstruction Services
- Pisgah Mountain Wind Project Preconstruction Services
- Fox Islands Wind Project

## **BENJAMIN R. BLODGETT | SUPERINTENDENT**

### **20 YEARS OF EXPERIENCE**

Ben has over 20 years of experience in the construction industry in roles ranging from carpenter, to foreman, to superintendent. Ben's responsibilities have included onsite construction planning, scheduling, and coordination and monitoring of work activities. Ben is proven in overseeing and managing multiple crews performing various skills.

### **CERTIFICATIONS**

National Center for Construction Education Foreman Certified #7538779 | OSHA 30-Hour

## **PROJECT EXPERIENCE**

### **PISGAH MOUNTAIN, LLC WIND ENERGY PROJECT – CLIFTON, ME**

Cianbro was the EPC contractor for the Pisgah Mountain Wind Energy project. The engineering, procurement and construction scope of work consisted of the site development, included access roads and turbine sites, coordination of the transportation of the turbines from the port to the site, erection of 5 1.8 MW Vestas V90 turbines, underground collection, overhead collection, and a complete collection substation.

### **BIG LEVEL WIND - PENNSYLVANIA**

Cianbro is the EPC contractor for the BOP services contract for the 90 MW Big Level Wind Project. The scope consists of the site work and access development, foundation, erection of 26 ea. GE 3.X turbines with 131 meter hub height, underground collection, overhead collection, a collection substation, an interconnect substation, O&M building and permanent MET Tower.

### **QUANTUM UTILITY GENERATION PASSADUMKEAG WINDPARK – LOWELL, ME**

Cianbro provided complete engineering, procurement and construction (EPC) services for the 40 MW wind farm.

### **ECO INDUSTRIES, LLC SPRUCE MOUNTAIN WIND PROJECT – WOODSTOCK, ME**

Cianbro erected a 20 MW wind project with 10 ea. 2 MW Gamesa wind turbines.

### **NEXTERA ENERGY MAINE FISH LIFT LOCKWOOD DAM PROJECT – WATERVILLE, ME**

Cianbro installed an elevator-operated fish lift, tank, and platform located adjacent to the Unit #7 hydroelectric power house.

### **CORE RESPONSIBILITIES**

- Responsible for running all aspects of the project
- Oversees and manages construction of the project, managing multiple skilled crews
- Coordinates work packages for construction sequencing and schedule compliance including change management

### **OTHER NOTABLE PROJECTS**

- Eastern Maine Medical Center West Parking Garage – Bangor, ME
- PENN National Gaming Hollywood Slots Temporary Gaming Facility – Bangor, ME
- Madison Paper #3 Paper Machine Rebuild – Madison, ME

## PETER A. FOSTER, P.E. | DESIGN MANAGER

### 36 YEARS OF EXPERIENCE

Pete has over 36 years of project manager, design, and construction experience in the following markets: Infrastructure, Industrial & Manufacturing, and Power and Energy. Pete also has extensive knowledge in Geotechnical Quality Control and commissioning of facilities. Pete's strength is in managing large projects and he is extremely knowledgeable with managing various construction and engineering related functions.

#### EDUCATION

M.S. Civil Engineering, University of Maine; Orono, ME  
B.S. Civil Engineering, University of Maine; Orono, ME

#### CERTIFICATIONS

Professional Engineer – ME, NH & NY | Design-Build Institute of America Member

### PROJECT EXPERIENCE

#### QUANTUM UTILITY GENERATION PASSADUMKEAG WINDPARK – LOWELL, ME

Cianbro provided complete engineering, procurement and construction (EPC) services for the 40 MW wind farm.

#### MOTIVA ENTERPRISES, LLC CRUDE EXPANSION PROJECT PORT ARTHUR REFINERY – BREWER, ME

Cianbro was selected from a field of 60 module facilities from around the world to construct and fabricate modules for Motiva's Refinery Expansion project located in Port Arthur, Texas. Cianbro assembled and transported 51 modules via barge as part of the 325,000 barrel-per-day capacity expansion project.

#### PETRODRILL AMETHYST SEMI-SUBMERSIBLE DRILLING RIGS – PORTLAND, ME

Cianbro completed the construction of two, 12,000-ton, offshore, semi-submersible oil drilling vessels.

#### GREAT NORTHERN PAPER COMPANY PAPER MACHINE REBUILD AND MODERNIZATION – MILLINOCKET, ME

Cianbro self-performed the No. 11 Paper Machine rebuild and modernization project, which included converting paper production from directory grade to supercalender "Grade A" Paper.

#### CORE RESPONSIBILITIES

- Provides and coordinates internal and external design engineering support
- Works closely with the team and owner to ensure compliance with project specifications, standards, and requirements

#### OTHER NOTABLE PROJECTS

- Central Maine Power – Various Transmission Line Projects, ME
- International Paper – Capital Projects Team, Various Locations in North Eastern United States
- Proctor & Gamble – Tambrands Account, Auburn, ME

## BRADLEY G. THERRIEN | SUPERINTENDENT

### 9 YEARS OF EXPERIENCE

Brad has over 9 years of experience working with Cianbro in the Power & Energy market. Bradley has worked on Transmission Line, Substation and Wind Farm construction projects. Bradley is knowledgeable in material procurement, managing the movement of equipment and materials, including distribution and tracking. Bradley also has experience in managing project schedules, monitoring daily production and maintaining detailed logs and reports.

### CERTIFICATIONS

OSHA 10-Hour | National Center for Construction Education Foreman Certified Plus #14802755

### PROJECT EXPERIENCE

#### **PISGAH MOUNTAIN, LLC WIND ENERGY PROJECT – CLIFTON, ME**

Cianbro was the EPC contractor for the Pisgah Mountain Wind Energy project. The engineering, procurement and construction scope of work consisted of the site development, included access roads and turbine sites, coordination of the transportation of the turbines from the port to the site, erection of 5 1.8 MW Vestas V90 turbines, underground collection, overhead collection, and a complete collection substation.

#### **BIG LEVEL WIND - PENNSYLVANIA**

Cianbro is the EPC contractor for the BOP services contract for the 90 MW Big Level Wind Project. The scope consists of the site work and access development, foundation, erection of 26 ea. GE 3.X turbines with 131 meter hub height, underground collection, overhead collection, a collection substation, an interconnect substation, O&M building and permanent MET Tower.

#### **QUANTUM UTILITY GENERATION PASSADUMKEAG WINDPARK – LOWELL, ME**

Cianbro provided complete engineering, procurement and construction (EPC) services for the 40 MW wind farm.

#### **GEORGIA MOUNTAIN COMMUNITY WIND, LLC WIND PROJECT – MILTON, VT**

Cianbro provided EPC services to complete a 10 MW wind project with 4 2.5 MW direct drive Goldwind America wind turbines in the mountains of Vermont.

#### **IBERDROLA RENEWABLES GROTON WIND FARM – GROTON, NH**

Cianbro was responsible for the heavy civil portion of the Groton Wind Farm project including construction of 12 miles of roadways, 24 rock-bolted wind turbine foundations, the underground collection system, medium voltage terminations, and an O&M Pre-Engineered Building.

### **CORE RESPONSIBILITIES**

- Responsible for running all aspects of the project
- Oversees and manages construction of the project, managing multiple skilled crews
- Coordinates work packages for construction sequencing and schedule compliance including change management

### **OTHER NOTABLE PROJECTS**

- American Electric Power 138kV & Beatty Hayden 345 kV Transmission Line – Columbus, OH
- Iberdrola / CMP MPRP Central Loop Project (230 Miles of Transmission Lines) – ME

**SECTION 5**  
**SAFETY**

**CIANBRO**

# SAFETY CULTURE

## 2018 SAFETY STATISTICS

> 5.7 million work hours

RIR 0.90

EMR 0.51

Beyond Zero - We Have Each Other's Backs

Cianbro Accident Prevention Process (CAPP)

"Healthiest and Safest Company in America" - ACOEM

**GOALS** = **Eliminate** At-Risk Behavior  
**ZERO** Injuries



Star Mobile Workforce  
Region One  
Voluntary Protection Programs  
An OSHA Cooperative Program

1 of 9 Star Mobile Workforce participants  
in the United States classified under  
NAICS code 237 - heavy construction



## Safety Policy

Cianbro team members deserve a work environment that is free from injuries, illnesses, and at-risk behaviors.

We will attain our goal of eliminating at-risk behaviors and achieving zero injuries by having each other's backs. We believe that teamwork is required to achieve a safe working environment.

All Cianbro managers are expected to provide an injury/illness free workplace for all team members and subcontractors. Supervisors must hold all team members, subcontractors and vendors accountable to high performance standards.

### Action Items:

The following minimum action items have been established:

- (1) Report all near misses daily. Expect your team to report near misses to you. This information, when acted upon, will improve our overall safety performance.
- (2) Measure performance and progress towards our ultimate goal and develop improvement initiatives to be implemented.
- (3) Use activity planning, frequent inspections of all work activities by competent persons, and other hazard recognition tools to identify and mitigate hazards.
- (4) Implement a "Safety Health Awareness Raises Excellence" (SHARE) committee at all work locations. Focus on improving the overall project/department safety processes to include eliminating, isolating or controlling physical and environmental hazards, injury management activities, eliminating at-risk behaviors, promoting wellness initiatives, community involvement, and team member morale, etc.
- (5) Support CAPP (Cianbro's Accident Prevention Process) at each project by allowing adequate time for team members to complete observations and provide immediate feedback to those observed.
- (6) Train each team member appropriately before starting a new work assignment. This training will, at a minimum, include workplace orientation, team member mentoring, care and use of personal protective equipment, and lastly specific activity planning instructions including recognition and mitigation of hazards. In addition, team members must be qualified to properly operate tools and/or equipment in order to complete their work safely. Supervisors must ensure that new team members are partnered with experienced team members to help them work safely.
- (7) Provide immediate medical attention from an established health care clinic or hospital to every injured team member.
- (8) Investigate all accidents, injuries, at-risk behaviors, and near misses to find root causes. The results of the investigation will be used and communicated to prevent future occurrences.
- (9) Pre-qualify subcontractors based on their safety performance and hold them accountable to comply with all federal, state, local, and Cianbro requirements. Monitor their safety performance and ensure that all injuries are investigated, documented and reviewed by project management.

We will communicate the Cianbro Safety Program to all Cianbro team members with innovation and effectiveness, while holding team members accountable to follow established safety initiatives.

The corporate, business unit/market and project safety managers will assist the project teams in developing, implementing, and monitoring their compliance with all safety programs, policies, and procedures.

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## Attachments ([Click Here](#))

- Beyond Zero Safety Reviews
- Cianbro Accident Prevention Process (CAPP) Card
- Counseling Report
- Daily Activity Plan
- First Report of Incident
- Hazard Hunt Card
- Hazardous Materials and Hazardous Waste Handbook
- Health and Safety Recognition Policy
- Incident Investigation Policy
- Injury Management Policy
- Lesson Learned Form
- Life Saving Absolutes Policy
- Progressive Discipline Policy
- Project Environmental Plan
- Project Management Plan (PMP) Outline
- Recognition Report
- Safety Inspection X-ray Program
- Safety Monthly Topics Calendar
- Safety Policy and Procedure Index
- Safety Specialist's Job Responsibilities and Expectations
- Subcontractors Best Practices at Jobsites Policy
- Wellness Program Brochure
- Work Activity Planning Policy



CIANBRO ACCIDENT PREVENTION PROCESS

**CAPP**

THE KEY TO SUCCESS

### Overview

Cianbro implemented the Cianbro Accident Prevention Process (CAPP) program in 1997 as a behavior-based safety process that provides all team members with the opportunity to participate in safety improvement by performing observations that identify both safe and at-risk behavior in everyday work activities.

### Vision

Continually improve our safety culture through management support of an employee owned and operated behavioral observation and feedback process that provides leadership and direction towards our goal of zero workplace injuries.

### Mission

Implement Cianbro's Accident Prevention Process (CAPP) into our safety program to create an environment of safe behaviors that will result in zero workplace injuries.

### Objectives

Identify safe and at-risk behaviors by observing work in progress

Provide immediate feedback to the person doing the work on what was observed safe and at-risk

Discuss alternatives to any at-risk behaviors to determine barriers that may exist to safely perform the work

Collect data to use in problem solving potential solutions

Develop action plans to eliminate barriers that may exist

Implement action plans and start the process over again



# TEAM MEMBER **WELLNESS**

Cianbro is committed to our Journey Beyond Zero: sending team members home **healthier**, more **educated**, and able to **influence** those around them

## **Cianbro's Wellness Program**

Encourages, Educates & Supports Team Members

### **"Wellness Program Best in United States."**

Wellness Council of America (WELCOA)

## **Health & Wellness Programs**

Tobacco-Free Workplace  
Healthy Lifestyle  
Health Coaches



**SECTION 6**  
**ENVIRONMENTAL**

**CIANBRO**

## SECTION 6

### Environmental Policy

The Cianbro Companies acknowledges its moral and legal obligations to protect the environment from undue risks of harm that may result from project activities or the use of hazardous substances or materials in its business operations. Cianbro is committed to providing a method to identify areas of environmental concern and to work proactively to minimize the impacts of construction activities on those sensitive environmental resources. Cianbro team members, and their subcontractors, will be aware of the environmental resources or concerns associated with the project or facility and the Federal, State and Local regulations that govern their protection. The Cianbro Companies will utilize proper Best Management Practices and develop policies to minimize impacts to sensitive environmental resources and maintain full compliance with all applicable regulations, while efficiently and effectively fulfilling the contract requirements.

Project Management and the VP of HSE of Cianbro will develop, implement, and monitor such programs as may be necessary to fulfill the foregoing policies and to train or otherwise educate all Cianbro team members concerning their individual responsibilities for these policies and such programs.

The expectation of The Cianbro Companies is that we will meet or exceed all applicable environmental laws at all of our locations. It is the responsibility of the management team at each site to follow the policies in place to ensure that this happens.



# **Cianbro Environmental Awareness and Compliance Plan for (Project)**

**Date:**

## ***Use of this Plan:***

*The following plan and steps should be included in each project Environmental Awareness and Compliance Plan for Power and Energy Services. Although permit/license requirements may change from project to project, the general process to comply with the requirements should remain the same. Once the requirements of each project are reviewed, this plan is intended to assist the project management staff in fully complying with the environmental regulations surrounding the project. The plan is meant to be modified to fit each projects needs and the narratives below should be taken as guidance to be sure the project team is aware of the environmental requirements of their work. (Template Revised January 2016)*

## Contents

### Part 1: Project Overview and Environmental Regulatory References

### Part 2: Identification of Construction Area and Environmental Impacts

**Preconstruction Site Walk/Meeting documentation**

**Preconstruction Checklist and Project Environmental Checklist**

### Part 3: Review of Potential Impacts of the Project

**Finalize Project Environmental Checklist and review with project schedule/activities**

### Part 4: Review and Planning of Work in Sensitive Areas

**Project Requirements from Stormwater Pollution Prevention Plan (SWPPP) or Erosion and Sediment Control Plan Notes**

**Construction Sequence to comply with the permits for Time of Year restrictions**

**Work in sensitive habitats – ESA, Natural Areas, Invasive Species**

**Cianbro Best Practices for Mat Placement and use**

### Part 5: Erosion and Sedimentation Control Measures

**State, Client or Region Manual guidance documents**

**Project Specific Erosion and Sediment Control Plan**

**General Cianbro environmental guidelines:**

- **Environmental Activity planning - Dewatering**

### Part 6: Spill Prevention and Response Procedures

**Prevention and Response plan**

**Full Spill Control and Countermeasure Plan (SPCC)**

### Part 7: Waste Handling and Minimization

**Storage/Disposal on Project**

**Storage/Disposal off Project**

**Demolition of material**

**Recycling**

**Part 8: Coordination with Major Activity and Daily Activity Plans**

**Inclusion of environmental requirements into daily work activity**  
**Inclusion of environmental requirements into schedule**

**Part 9: Monitoring of Construction Activity**

**Inspection reports – weekly required**  
**BMP logs – project specific**  
**Protocol for monitoring sensitive resources – Project specific**

**Part 10: Reporting Inspection Results**

**Reporting Protocol for environmental concerns**  
**Corrective Action Reports**

**Part 11: Environmental Orientation Training**

**Training will be developed and presented to each team member. Example included, should be *project specific***

**Materials Handling, Storage and Spill Response Plan**  
(details are project specific)

**Attachment**

**Preconstruction Site Walk Checklist -template**

**Attachment**

**Project Environmental Checklist - template**

**Attachment**

**Flagging and Construction Restriction Guide**

***project specific***

**Contacts**

***project specific***

## **Project Environmental Plan:**

**The overall purpose of this plan is to provide a method to identify areas of environmental concern and work proactively to minimize impact of construction activities on those areas of environmental concern. Team members, and their subcontractors, will be aware of the environmental concerns associated with the project, their locations, and will utilize the controls discussed in this manual to minimize impacts to those resources while efficiently and effectively fulfilling the contract requirements.**

### **Communication:**

The *purpose* of this environmental plan is to inform and educate team members of the importance of maintaining good environmental practices throughout the duration of the project. Clear and continuous communication is essential in maintaining compliance with the environmental permits governing the project. This plan will outline issues related to environmental concerns and stipulate Best Management Practices to ensure the construction activities conducted by the team members working on the project does not result in an environmental violation.

### **Training**

Project environmental staff will conduct an environmental orientation as part of the overall team member orientation process for the project. Site specific Environmental Orientations may be conducted as part of the site or even job specific Activity Plans as needed. These site specific environmental orientations may only be given to the team members responsible for conducting that job. The need for additional site specific environmental orientation will be determined based on the results of the preconstruction walk through.

## **Part 1: Project overview and Environmental Regulatory References**

### **Permits and Licenses**

- *In this section list all regulatory licenses, documents, manuals or other environmental requirement for the project. Examples include Department of Environmental Protection or EPA project specific permits, Construction Storm water General Permits, Army Corp of Engineers or local environmental requirements/construction permits. Include those issued to the Owner and those to be obtained by contractor(s).*

### **Scope of Work**

- *In this section list the project scope of work including state, municipality and the acreage expected to be impacted by the project. A site location map should be included with access roads to the site marked. Use of special equipment or oversized loads should be noted so use of an appropriate access route can be planned.*
- *Be sure the Project Environmental Checklist is completed and included in this section.*

### **“Findings of Fact” or Permit Conditions:**

- *This section should note the specific conditions or concerns addressed by the regulatory agency through the permits or licenses. These conditions are often found in the “findings of fact” portion of a license or listed as “conditions”. This section will also call out any additional material, such as a Vegetation Management Plan or Endangered Species Plan (incidental take plan) which was part of the environmental permitting application package and is now considered a condition of compliance for the license. The conditions should be listed in table form for easy reference.*

**NOTE: An environmental license may have multiple conditions or plans that should be noted in this section. Each should be noted in the Awareness and Compliance Plan. This plan should be developed to include all of the above areas as needed.**

## **Part 2: Identification of Construction area and Possible Environmental Impacts**

### **Preconstruction walk through:**

The first step is to review all areas of Environmental Concern during a **pre construction site walk** and by reviewing any resource maps or sediment and erosion control drawings provided by the Owner in a document such as a Stormwater Pollution Prevention Plan or SWPPP (if not provided, review state and federal agency data available via most agency web sites). The site walk notes, photographs of environmental areas and review of the project drawings and permits will be used to develop the remaining sections of this plan.

It is helpful to have all environmental resource areas identified or flagged prior to team members entering the site for this pre construction walk. Determine if flagging or resource identification is complete prior to scheduling a walk.

It is important to note the construction restrictions for each environmental resource and their location in reference to the various construction activities and phases of activity. If the field review notes that a construction activity cannot be completed without infringing on a sensitive environmental resource, there may be impacts to the construction schedule or additional work which will need to be completed in order to comply with the permits.

**KEY NOTE: Any changes to the project plans or permits needed based on the preconstruction walk results must be brought to the attention of the project management and environmental agency immediately following the preconstruction walk if they are not already present. (Preconstruction Checklist template – Appendix 2)**

### **Photo Documentation:**

Pictures of these locations can, and should, be taken prior to construction activities. The photo documentation is helpful in establishing baseline conditions and assuring the resource is left or returned to natural conditions after any permitted temporary impacts. All areas must not be disturbed unless the environmental permit has authorized the disturbance. All disturbed sensitive resource areas must be returned to natural state as soon as possible when construction is complete. The photo documentation will also assist in assuring any disturbance which was existing prior to the project is tracked and not attributed to the project activity. An example would be non-project ATV traffic or a abutting landowner project which created a disturbance beyond the project permits.

### **Flagging:**

All sensitive areas will be identified with flagging. The project contract documents will identify which party is tasked with installing and maintaining the environmental flagging for the project. This should be noted in this section of the plan. Maintenance of the flagging is typically a permit requirement.

It will be the project team's responsibility to be familiar with the flagging system for sensitive environmental areas and methods (BMPs) utilized to assure these sensitive areas are not impacted by construction activity unless permitted to do so. The team must

successfully implement the required BMPs in order to maintain compliance with both state and federal rules, and complete the project with as little environmental impact as possible.

A Flagging and Construction Restriction Chart should be developed and kept on the project site with the Major Activity Plan.

- *In this section insert the completed preconstruction site walk checklist, project environmental checklist, notes from preconstruction meeting on any environmental concerns, flagging chart and reference to the location of any project specific drawings, specifications and plans. All should be summarized with a brief narrative.*

### **Part 3: Review Potential Impacts of Project:**

The environmental specialist or safety specialist will review the results of the preconstruction site walk with the construction manager/superintendent and develop Construction Access Plan or Storm water Management Plan or Cianbro Major Activity Plan (as needed by the project requirements) that includes how environmental controls will be placed to establish initial compliance with the regulatory requirements of the project. The planning process for the work will address which types of construction activity are to be performed that day and how they can impact the sensitive areas identified via the site walk. An Environmental Activity Plan, or equivalent, will be completed with the Daily Activity Plan for the work scheduled. The Environmental Activity Plan must clearly address the sensitive areas and any practices needed to comply with the environmental permits. This Environmental Awareness and Compliance Manual will be used as a reference in developing those procedures to protect the sensitive locations during construction. The Environmental Manager or Environmental Specialist or Safety/Environmental Specialist assigned to the project will assist in developing the Environmental Activity Plan. A site specific Environmental/Safety Orientation will be given to the team members working on the project which will include areas of significant environmental concern.

The following sections of this manual discuss the requirements of the contractor to assure this project is conducted in a manner to achieve compliance with all environmental permits and to be sure we leave as little impact on the natural environment as is possible during construction. The following sections must be considered when developing the project work plans. A Third Party Inspector from the regulatory agency may be assigned to the project to oversee compliance.

- *In this section list the permitted and potential impacts of the project scope*
- *Review those requirements for overall constructability – i.e.: we need to cross a wetland that was not permitted to be crossed by the environmental agencies. To do so will require a permit modification. This will need to be documented to the owner.*

## **Part 4: Review and Planning of Work in Sensitive Areas**

**ALL** designed access roads to be used for delivery of material, components and overall construction traffic of the project should be done according to the project issued plans and specifications. The guidance listed below are best practices used by Cianbro and typical to the industry for temporary access travel; BUT are only for reference in planning a project. Close attention must be paid to the road design/construction for stormwater and surface water flow. All changes should be sent to the owner and environmental for review/approval as many changes to the design require regulatory permit changes. In some cases this could be a time consuming process.

### **A. How do we know we are working in Sensitive Areas?**

A set of plans or maps may have been prepared for the Project that graphically presents sensitive environmental resources located within the Project footprint. If not prepared, the environmental team should prepare a set of aerial photos or other sketch of the project site and indicate any areas of environmental concern. Project components, such as access roads, should be overlaid on the environmental data to show construction personnel the relationship between the sensitive resources and allowable project-related impacts. These maps are provided to work crew with other construction documents. The sensitive areas will have been identified during the pre-construction walk through.

#### **Definition: Sensitive Area:**

A *sensitive area* may include, wetlands or water courses, steep or erodible terrain, archeologically significant sites, and sites containing rare, threatened or endangered species, invasive plant and insect species. Flagging should denote these areas. If there is a question on the location or need to perform work in a marked sensitive area, contact the environmental coordinator or manager assigned to the project. For a list of potential sensitive areas see the pre-construction checklist in Step 1.

*This section should be used to reference project specific plans with a bullet list of items specific to our construction activity.*

#### **Cianbro Best Practices include:**

- **no fueling within 100 ft of a wetland/stream without secondary containment measures**
- **No travel within the vernal pool buffer areas without permitted permissions**
- **Stabilize exposed soils within 48 hours or before rain**
- **Permitted stream crossing locations must be reviewed with environmental prior to construction.**
- **Permitted culvert locations reviewed with environmental prior to construction**
- **Construction mat placement and cleaning best practices**

- **Stormwater Management devices/structures must be reviewed with environmental prior to construction and verified by the design engineer post construction.**
- **Construction Schedule to include Time of Year Work restrictions**

**The above practice apply to Cianbro and project subcontractors.**

## **B. Clearing and Vegetation Management Plan (VMP) or Endangered Species Management Plan (or ITP)**

*If required by the project,* additional environmental requirements may be listed in area specific plans or sections of the project permits. The additional environmental plans/requirements associated with the project should be reviewed during the development of the Pre Construction Checklist. Areas which have been mapped to contain any sensitive areas AND require work in the sensitive habitat should be scheduled for completion of that portion during a time when the subject of the sensitive habitat is not utilizing the area (for example do not work around an active eagle nest; wait for the nesting season to be over). Frozen ground or winter conditions may allow for work in these areas without the use of timber mats. Activity which may require special planning from an additional permit requirement or “plan” such as the “Vegetation Management Plan” or “Endangered Species Management or Take Prevention Plan”

- **Clearing or access construction activities in any sensitive habitat (flagged area)**
- **Herbicide applications**
- **Work in or near Vernal Pools**
- **Work in or around Rare Animal or Plant Communities, Inland Waterfowl and Wading Bird Habitat and Deer Wintering Areas – Time of Year work restrictions**
- **Work in, through or near Invasive Species or Plant areas (flagged)**
- **Wetland or Stream Alterations or Crossings**

When work in these areas is required, the project specific requirements will be outlined in the Activity Plan for that day or project.

Clearing of wetland or stream areas must be done according to procedures outlined in the environmental permits and as indicated in this manual.

Team members will be familiar with these procedures prior to construction start. Good Practices that are often required by many state environmental licenses are as follows, please refer to the project specific permits, this is meant as **guidance only, and setbacks for work around resources can vary by state or region:**

1. Riparian buffers (vegetation) must be retained within **100 feet high class** water body. These areas should be flagged in the field and Resource maps

are available. The agency may approve a lesser buffer if it is determined there will be no impact on the threatened or endangered species. The buffer is measured horizontally from the top of the bank.

2. No accumulation of slash may be **left within 50 (fifty) feet** of the top of the stream bank. Any debris that falls below the normal high-water line of a water body or tributary stream shall be removed.
3. On all other streams and rivers (lower or lesser quality waters) minimize clearing of shrubby vegetation in the immediate vicinity to maintain shade. Exercise care in clearing to minimize foot traffic at stream bank.

**Definition: Riparian Buffer Zones:**

Riparian Buffer Zones are important in protecting many sensitive species that live around or in streams, wetlands and rivers. Habitat area native to that location and stream – construction work can alter these areas if allowed by the permit; we should do our best to protect the Riparian Zone and limit the impact on the stream life.

**C. Temporary stream or wetland crossings and Construction Mat use:**

Multiple areas of the project may require a stream or wetland area to be crossed temporarily in order to establish final roads for construction of turbines; such as during clearing activity. Where water body crossings do need to occur, temporary crossings (i.e. temporary bridges or timber mats) will be used to cross streams, drainage ways or wetlands that contain any of the following:

- flowing water
- standing water
- saturated soils
- organic/mucky soils

No equipment will operate in or travel through the water or on soft or saturated wetland soils, unless determined otherwise by Environmental Specialist, or the Third Party Inspectors. Any work in such areas will be outlined in an Environmental Activity Plan.

**1. Acceptable Crossings:** Unless completely frozen, streams must be crossed using ***Construction Mats or Bridges***. Culverts are allowed only under certain conditions as noted below.

**2. Culverts:** Culverts may be used to divert or provide passage for surface waters only in specific instances licensed under the permit. ***Each state may have specific culvert use and placement requirements, review the requirements and add to this section as needed. If not specifically noted on the project Erosion and Sediment Control Plan or in the SWPPP, contact Project Management and Environmental BEFORE installing.***

### **3. Construction/Crane Mats and Mat Placement:**

Proper cleaning of the excess sediments will be done prior to using the mats in a new location. Any cleaning activity must be done in a dry, upland location with proper disposal of any sediment. Upland sediments ***cannot be tracked to wetland or stream areas.*** ***Plant debris or materials cannot be tracked out of the area of origin*** to avoid spreading invasive plant and insect species.

**Mat Placement:** Every effort should be made to assure that the mats remain clean and sediment is not pushed, washed or blown into surface waters or wetland areas. Items to consider when placing mats:

- Be sure mats are cleaned of any excess sediment, bark or plant matter prior to entry into the ROW. Cleaning of the mats should have occurred prior to movement from the last area of use. ***Document mats are clean prior to use.*** ***Some projects require reporting of the mat use locations to limit risk of invasive species transport.***
- Use additional mat sections to assure a dry entry to the mats,
- A woven geo-textile fabric can be placed beneath the mat sections where possible. The geo-textile will allow water to move through the fabric, but reduce the migration of sediments away from the matting area. This may be helpful in wetland areas without standing water or prior to stream crossings, or
- Place heavy rock at the entrance and exits to assist in collecting excess sediments and reducing tracking prior to migration to the wetland area and, or;
- Hand or equipment cleaning of mats of any excess sediment will be done on an as needed basis, ***and*** prior to any storm events. Sediment will be placed in an upland area with control devices in place to eliminate migration of the sediments to wetlands or water resources. Removed excess sediments will be spread in the upland, covered with topsoil or ECM and allowed to revegetate.
- ***Sediments will not be allowed to enter the wetland or water body.***

**Mat Cleaning Procedure:** Once removed these procedures should be followed prior to transport to new use location.

- Mats should be placed in a designated location, away from *any* resource. The designated area should be upland; flat and well vegetated if available.
- Prior to leaving the site for the day or closing out the jobsite, mats should be swept and shoveled of excess sediments, plant material and associated debris.
- In most cases sediments may be spread in an upland location and stabilized (seed, mulch). It is important to refer to the project permits and plans for additional requirements.

### **D. Invasive Species/Plant Management:**

If ***invasive plant species or insect species*** are found to be located in the area of construction activity, equipment and timber mats, or other reuseable construction

materials must be monitored for transport of soil, plant matter and visual inspection for pests.

**1. Construction Mat/Crane Mats:**

Prior to transport out of the invasive area; mats must be allowed to dry, then plant matter and associated sediment swept or removed from the mats and collected in containers for disposal per the project permits. As noted above, the decontamination process for the mats must be documented. Cianbro will use the Daily Activity plan for that work activity to document mats have been treated to the best of our ability to remove invasive plant/insect matter.

In some cases the dry mats must then be transported to an appropriate location for decontamination BEFORE being used again. If wash solution is used, wash water cannot be discharged to surface waters. Containment and proper disposal of *any* wash water is required. Only in rare cases is a decontamination solution or wash solution needed, refer to project specific requirements or contact the Environmental Coordinator/Manager for direction.

**2. Equipment Cleaning:**

Equipment will be cleared of accumulated sediments and plant matter prior to moving out of the designated invasive species locations. Sediments and plant matter will be collected with any construction mat debris and handled according to the project permits.

## **Part 5: Erosion and Sedimentation Control Measures:**

Correct placement of Erosion and Sedimentation Control measures are a high priority to reduce the impact of the project on any sensitive environmental areas. Erosion and Sediment Control measures must be in place prior to beginning construction or in conjunction with the work. In addition to the following description of standard sedimentation and erosion control measures to be employed during this project, a narrative requirement for sediment and erosion control is included in Part 7 of this plan. Team members will work to reduce or eliminate erosion and sedimentation issues by performing the following preventative steps:

**Erosion and Sediment Control Plan essential components:**

Disturb only areas that must be disturbed as outlined in that day's Activity Plan. If necessary, a detailed Erosion and Sediment control plan will be developed for the activity, otherwise the following bulleted items will be utilized for each activity.

- Team members will plan which areas will drain to what BMPs prior to disturbing that areas and as the project progresses.
- A preliminary stormwater, snow melt drainage plan will be developed as part of the Construction Access Plan / Storm Water Management Plan prior to beginning construction activities if there is the potential to impact wetlands, streams, vernal

pool habitat areas or other sensitive environmental resource. The plan will consist of a map indicating, access roads, wetlands, sensitive resources and placement of sediment controls to protect those resources from storm water or snow melt associated with the access.

- **Sedimentation and Erosion Control Measures** will be installed **prior** to beginning construction activities (exposed soil such as grubbing). The initial site walk and segment construction plan will stipulate minimum controls. Additional controls may be used to prevent discharges of sediments to sensitive resources as construction progresses. Team members should contact the Environmental Specialist for the project if there is a question on the use or installation of S and E controls.
- Pay attention to “run on” areas from upstream slopes, wetlands or streams. Water from these locations may flow across construction areas if not diverted or controlled. Ground water may also be a contributing factor in spring during thaw or in high ground water table areas.
- Prevention is the best method to be sure the team does not encounter any environmental violations. Disturbance of a certain areas or storage of material piles must be accomplished with minimal exposure to surface waters via stormwater or by tracking of materials. Pre planning is key to preventing discharges of sediments or other pollutants from the construction site.
- The use of additional silt fencing, erosion control mix berms or dewatering activities is acceptable, but these additional controls should be logged for maintenance monitoring.
  - **DO NOT** construct any additional structural controls beyond those specified in the site design for the project without approval of the Owner and regulatory agency.

### **BMPs: Use and installation of Sediment and Erosion Controls:**

Team members will install all sediment barriers in accordance with the project plans and guidance in this manual. Team members are made familiar with proper sediment and erosion control measures during annual and project orientation training. State regulatory agencies may include specific types/brands ect of controls in each permit. This section should note those specific controls. In general if the project permits do not state specific types of controls, a wide variety of sediment barriers or erosion control techniques may be used on project including:

#### Silt Fences-

- Along all access roads or work areas within 100-feet of water resources or wetlands if permitted by the project permits.
- Along all access roads or work areas in upland settings that encountered runoff or seepage moving across slope.
- Around stockpiled soils.
- Silt fence must be inspected weekly or after rainstorms producing at least one half inch of rainfall or a heavy down pour or daily during a prolonged rainfall.

### Erosion Control Berms

Erosion control mix consisting primarily of wood chips, waste wood, bark mulch and similar material. Specifications for Erosion Control Mix can vary. Refer to project permits for acceptable use of Erosion Control mix and berms. Use is similar to silt fencing, but can be more appropriate in freeze thaw or frozen ground conditions as the berm moves with the earth. **BE SURE TO PLACE THE BERM ON GROUND, NOT SNOW OR ICE.**

Berms and Silt Fence should be installed in an area free of debris, rocks, bumps or other obstacles that may cause the silt fence or berm to be ineffective. Both the berm and silt fence should be “keyed” into the soil with the use of a 4” trench when possible.

### Erosion Control Socks

Mulched wood or wood waste filled socks of varying diameter. Use is similar to silt fencing, but do not require “keying” in to the ground. The socks must be staked into the ground and repaired or reset if damaged.

### Mulch

Hay or Straw mulch is acceptable in most cases.

Slope and Seasonal Guidelines for placement of mulch do apply. Team members will refer to the Sediment and Erosion Control BMPs for the project and the agency permit for winter stabilization requirements, amounts of mulch/slope ratio or will contact the project Environmental Manager or Specialist.

### Stone Check Dams

Stone Check Dams are typically constructed of 2-3 inch stone. Check dams may be placed in ditches to slow flow of stormwater and reduce sedimentation caused by erosion. Stone check dams are also helpful in trapping some sediment with larger particle size. 2-3 inch stone will not trap finer particles, but may create detention time, allowing for settling of sediments. At that point, solids should be removed from the ditch line to reduce the chance of re-suspension.

Level spreaders, rock plunge pools: These devices can be useful in slowing water flow and collecting additional sediment from the discharge. However these controls should only be used if the stormwater component of the design calls for their use or they can be removed and not effect the overall engineered design of the site. These controls would be a structural addition and may require additional oversight from the Owner and possibly regulatory agency prior to use.

**Project Specific BMPS:** *In this section add references or specifications for any project/permit specific control devices which must be used. The project SWPPP can also be referenced in this section.*

### **Maintenance**

**Status of sediment control devices will be reviewed during daily site inspections. Maintenance must occur when the area behind the device has become 50% full.**

**ALL controls must be maintained until the vegetative cover is over 70% established**

**REMEMBER:** Construction activities during winter months do required different stabilization BMPs. If there is a question contact the Environmental Specialist.

## **Part 6: Review and Develop Spill Prevention and Response Procedures:**

**Spill Contingency Plan** At a minimum the following procedures will be followed for prevention of spills. These procedures will be reviewed during each site safety/environmental orientation. Based on the preconstruction walk through, additional requirements may be added to the Spill Contingency and Clean up Plan.

It is the team members' responsibility to be familiar with the spill prevention and response procedures required by the environmental permits for the project and add to this section as needed. Cianbro Corporation procedures are as follows:

- Fully stocked Spill kits must be present at the location of fueling, along the ROW work area and a minimum of absorbent pads kept in each piece of equipment. Fully stocked spill kit means, absorbent pads, containment boom or sock(s), speedi dri material and disposal containers. A supply of disposal drums will be kept at the project trailer site for use if needed. An emergency contact sheet and instructions must also ***be in the kit.***
- Spill kit should be checked daily for contents before traveling away from the base location.
- Visual inspection of all equipment for potential hose breakage or leaks. Document inspections. Daily inspection logs should be kept with the equipment.
- Spill containment materials should be on site with spill kit – i.e. drip pans or drums for containment of wastes if maintenance of a piece of equipment must be done in the field.
- Awareness is key to prevention. Periodic inspections of the travel ways to reduce incidental spills over a distance should be conducted. If detected, immediate clean up is required.
- The use of herbicides will require review of the VMP and a separate herbicide use plan developed according to procedures outlined the environmental permits or agency rules.

### **Spill reporting**

All spills must be reported to the Construction Superintendent who will then report them to the proper state agency and to Corporate Safety and Environmental. **Spills must be reported with in 2 hours.** The spill must also be recorded on the spill reporting form and submitted to the team Environmental Manager or designated contact. If a spill reaches surface water, the National Response Center must also be contacted. In case of emergency situations, contact phone numbers for the State Agency spill response, the National Response Center, environmental manager or project manager, and an approved spill response contractor, such as Clean Harbors, will be posted at the site and a copy kept in the spill kit(s).

For additional information on the requirements, team members may refer to The Material Handling, Storage and Spill Control Plan.

### **Material Storage and Inventory**

A Materials Inventory list and storage requirements will be developed as needed for any project with a material storage area requiring measures beyond sediment control, secondary containment and procedures outlined in the Spill Contingency Plan above. It is anticipated that any hazardous materials or materials requiring special storage will be kept in a designated lay down location with proper containment and routine inspection. A Material Storage and Handling plan will be developed for each yard location and any storage areas on the ROW. This plan will include the above mentioned spill control and clean up procedures. See attachment A.

## **Part 7: Waste Handling and Minimization:**

Waste Handling and Minimization site specific plans will be developed for the project material storage areas. The following guidelines can be utilized to develop the plan. (See also Attachment 1)

### **Plan Guidelines:**

This section will describe the methods to be utilized for the identification, segregation, storage, testing, recycling/disposal and disposition of construction spoils (Excess Materials) generated as a result of this project. The Environmental Coordinator will oversee compliance with applicable state, federal solid waste and hazardous waste regulations and all other applicable rules for handling of Excess Materials Encountered during this project.

***Contaminated Excess Materials*** “are any Excess Materials that are not considered inert due to the presences of chemical constituents that are not naturally occurring at concentrations that exceed regulatory threshold criteria established by the applicable law and are present as a result of anthropogenic sources.” Examples that may be encountered during this project include: treated

and untreated wood, soils, scrap metals, trash, oily waste, hazardous wastes and universal wastes.

**Staging and Stockpiling of Excess Materials** –Stock piles of contaminated soils will not remain on site past the day they were generated if possible. Where practical all contaminated materials will be stored in steel, sealed roll off containers. Stockpiled soils must be placed on a minimum of 6-mil plastic sheeting. Piles and containers will be covered from weather when not in use. If materials stockpiled on plastic are to remain on site *beyond* the day of generation, these piles must be covered with the 6-mil sheeting, surrounded with a berm (clean soil, hay bales or keyed in silt fence). Material must be removed to the approved disposal or recycling facility as soon as possible.

- Locate, obtain access to, design, permit (if needed) and maintain the Interim Storage Area (ISA) for all solid Excess Material. These areas must, in all cases, be in full compliance with Applicable Law and regulations;
- Ensure that soil and erosion control and leak containment measures are in place at the ISA;
- For contaminated Excess Materials, maintain copies of load tickets/manifests for all Excess Materials transported to and from the ISA to enable a fully traceable document trail to the disposal site;
- For contaminated Excess Materials, stock piles or containers will be covered and managed according to the practices above.
- Material will be segregated according to physical characteristics and waste classifications. All analysis on the excess materials will be kept at the ISA with their disposal or recycling records.

#### **Recycling and Disposal Options:**

- *This section should list all expected materials to be disposed of and recycled at the project. This may include one or more of the following:*
- ***Lead Paint, Asbestos, and Mercury Switches/Universal Wastes/Hazardous Wastes:*** Removal, storage and transportation of these items, if encountered must be in accordance with Solid Waste and Hazardous Waste Management and Transportation requirements. These rules can be both State and Federally regulated.
- ***Soil and Rock:*** excess uncontaminated soil and rock may be reused, sold or given away by the contractor where applicable to state and federal regulation.
- ***Contaminated Soil and Rock shall be transported to a fill, recycling or disposal facility as indicated by the waste characterization.*** Owner approved disposal facilities may be required.

**Solid Waste Disposal Records and Documentation:**

*The following is true for many projects, but please review the specific requirements and update as needed.*

**Owner** shall be identified as the generator of any Excess Material transferred to a recycling or disposal facility except in such cases where contaminated Excess Material is not Pre-Existing and was generated by, or as a result of the action of, the Contractor. In such cases, Contractor shall be identified as generator and pay for transportation and disposal of such Excess Material that is not pre-existing contaminated Excess Material.

**Contractor** shall obtain written statements from all treatment and/or disposal facilities acknowledging acceptance of Excess Material and the testing associated therewith, if any.

**Contractor** shall prepare all waste profiles (as required by recycling/disposal facilities), bills of lading, and/or shipping manifests. Contractor shall provide copies of all filings and other documentation required in connection with the disposal of Excess Material to the owner.

**Liquid Material Management – Dewatering Plans:**

If needed based on Pre-Construction site walk.

Prior to beginning any excavation work for foundations, a Dewatering Plan will be developed for management of excess liquid material.

**Part 8: Construction Sequencing for Environmental Compliance; Coordination with Major and Daily Activity Plans**

**Communication of Restrictions:**

The Pre-construction checklist and review of the items discussed in the previous Parts of this plan will be discussed and reviewed for incorporation into the project scope. Each activity plan will have a corresponding Environmental Activity Plan or section of the Daily Activity Plan designated to track environmental compliance. The form will review the environmental concerns associated with that activity and how those concerns will be mitigated. For example placement of silt fencing, berms or diversion structures will be noted. It will be the responsibility of the designated environmental team member on site to give the initial review of any areas of concern in that section of work to the team members. The sensitive areas and restrictions will be reviewed as needed with team members during morning stretches. The responsible environmental team member will be regularly inspecting work areas for compliance with environmental regulations.

If a sensitive environmental area is impacted by the construction activities, the designated environmental team member and construction superintendent will investigate the causes and issue a warning and any discipline measures if warranted. The goal of a project is to have ZERO environmental violations. If good communication and awareness skills are established during the beginning of the project, the goal should be attained.

- **For this section: The following items can be replaced with permit specific documents, but the intent of this section is to document a process to include environmental controls and requirements in the planning of the construction activity.**

### **Construction Sequencing or Environmental Activity Plan items:**

For environmental compliance the Construction Sequencing Plan or Major Activity Plan should include the following items as to be listed on the Environmental Activity Plan form:

- Sediment and erosion control plan, including the items listed in the example below
- Pre-construction checklist
- Resource Maps depicting location of any wetlands, streams, sensitive habitats or species; or
- A map generated by the environmental specialist (or owners) which indicates wetlands, access roads, structures, sensitive resources and wetlands and placement of erosion and sediment controls.
- SPCC plan or Materials Handling, Storage and Spill Response Plan if appropriate.

### **Sediment and Erosion Control Plan: Construction Sequence minimum**

**requirements.** The following steps are to be referenced in every Activity Plan with Sediment and Erosion Control requirements. Additional items or requirements may be required by the Third Party Inspector, regulatory agency or by the client. A general Sedimentation and Erosion Control Plan has been developed by the project engineer and can be referenced as Section 015713 – 2 Rev 2 of the construction specifications. The contractor is expected to follow the erosion and sediment control plans issued for each section in addition to these basic practices.

1. Establish construction workspace limits, construction sequence; identify the sensitive areas – Utilize the Pre-Construction Checklist.
2. All work will be performed in accordance with good sediment and erosion control practices and construction stormwater best management practices.
3. Prior to use of the access road, construct and stabilize the entrance area with a stone pad, mud rack or other materials or containment system used to reduce the tracking or flowing of sediment off the site. This area may also be used for cleaning of mats and equipment prior to tracking to another segment access point. All materials or sediments removed from the equipment must be disposed of properly.
4. Install and maintain sediment barriers such as silt fencing and or other erosion control barriers along the down hill limits of any work. Drawings will show the appropriate locations for sediment controls, however these may be adjusted in the field as is appropriate. (to avoid, tree roots, rocks ect). Document placement and do not place beyond permitted boundaries unless approved in writing by the Owner or permitting authority.

5. Additional controls will need to be used for sediment control if construction activities indicate a need.
6. Access roads, equipment and material storage areas and parking areas should all be stabilized with matting, crushed stone or gravel as necessary to avoid ponding of water and rutting of the road surface.
7. The contractor shall stabilize any exposed soils that will remain exposed for more than **7-days with** mulch or other non-erodible cover.
8. The contractor shall stabilize areas within **75 feet** of a wetland or water body within 48 hours of the initial disturbance of the soil or prior to any storm event, whichever comes first.
9. Minimize the amount of disturbance at any one time by staging construction as much as practical. Natural vegetated buffers or strips of vegetation should be left in place as much as possible to reduce erosion potential.
10. Any excess spoils or material should be removed from the site as soon as possible. Stockpiled soils that remain in place for **48 hours** or more, or is placed prior to a rain event, will be contained with sediment barriers such as silt fence, hay bales or equivalent. The sediment barriers shall be adequately located and reinforced to handle a significant rain event and potential slumping of the pile. Apply temporary seed and mulch to any pile that is not expected to be disturbed within **30 days** and anchored mulch daily to piles during winter construction.
11. Inspect and repair all sediment and erosion controls as needed. Daily inspections during active construction (combined with the daily site walk), weekly and after rainfall of 0.5 inches or more in a 24 hour period. Remove any accumulated sediments at 1/3 capacity of the structure. Daily inspections should also take into consideration the public roads travelled by the construction vehicles for tracking of sediments or other materials.
12. Maintain all sediment and erosion controls until vegetation has been established over **85-90%** of the area. Reseed as needed until well established. Only then may the temporary controls be removed.

**NOTE: Yellow Highlight denotes values that may change with permit conditions**

## **Part 9: Monitoring of Construction Activity:**

### **Daily Inspection Reports:**

Daily inspection reports conducted by either a team member the environmental specialist. These reports will cover all environmental issues related to the project as well as construction and safety concerns. Results and issues will be discussed during the weekly safety/environmental meetings. Daily work area inspections can be documented in the daily report format currently utilized and stored in ConstructWare. Most environmental permits require tracking of the installation and maintenance of Best Management Practices. Cianbro utilizes a BMP log for this purpose. The log can act as the weekly report. Example attached.

**Other Inspections and reports:**

- *In this section note any additional requirements by the project contract or environmental permits.*

**Documentation Requirements:**

- **Pre-Construction inspection/walkthrough Report:** The results of the walk through will be utilized to develop the Construction Access Plan and subsequent activity plans for that segment of construction.
- **Environmental Activity Plan:** The Environmental Activity Plans will be developed as needed for work in sensitive environmental areas and copies kept at the jobsites for reference and training of new crew members. (Attachment 3 Environmental Activity Plan)
- **Daily Inspections:**  
During construction the contractor is responsible for conducting daily inspections to be sure the site is in compliance with all permits and regulations. If there is a question as to the status of the site, the Environmental inspector must be contacted.

**Items to review during daily inspections:**

- Weather
- Flagging still intact?
- Are all disturbed areas protected from discharging sediment to a sensitive area via proper sediment controls?
- Have completed areas been stabilized?
- Is there any erosion of currently stabilized areas? If yes, a Corrective Action and Report must be completed as soon as possible to reduce further erosion. If the area of erosion is causing sediments or other materials to threaten a sensitive area, sediment controls must be installed immediately.
- Are there any special considerations for continued work at this project site: future wetland impacts, stream crossing, any new sensitive environmental habitats discovered?

**Storm event or snow melt inspections:** The project site must be inspected for any signs of erosion or sedimentation issues following a storm event or major snow melt. (greater than 0.50 inches in 24 hours) The inspection must be documented, any required corrective actions initiated and the report discussed during the weekly meeting.

**Part 10: Reporting Inspection Results**

Any discharges of pollutants or other environmental violation; or condition that may lead to an environmental or other regulatory agency violation must be reported to the project site manager and environmental inspector immediately and the issue corrected if possible. If not possible to correct the situation immediately, temporary measures should be established and a ***Corrective Action Report (see report template attached)*** completed. Notification to the regulatory agency should be given as well as to the client or owner depending on project specific requirements. It is always best to report issues immediately than to wait or attempt to fix the situation without input of the regulatory agency. The Third Party Inspector may also be involved in this process. Conditions requiring correction may include:

- Discovery of faulty or improperly installed sediment controls – fix immediately
- Sediment controls in need of maintenance – perform maintenance immediately
- Evidence of a discharge after heavy rain or snow melt (i.e.: silt in a wetland area)  
*Report this to supervisor; owner representative on site and Environmental Specialist upon discovery.*
- Exposed areas of construction site during a period of inclement weather which may result in a discharge. Report the condition to the project supervisor for development of a corrective action plan. Reporting requirements of such instances may be different per project contracts. Be sure to review these requirements carefully.

Follow up Items:

- A template corrective action report form is included with this template, alternate forms may be used provided all items are captured. A Cianbro Lessons Learned should be generated and submitted to Corporate Safety/Environmental if the issue may be relevant to other work.
- The project team will perform additional training to prevent further issues corrective actions to prevent a discharge.

#### **Non-Conformance with environmental controls:**

- *In this section list any additional contract or project specific non-conformance requirements. Project specific.*
- *Corrective Action Report form*

#### **Step 11: Training: Level II Environmental Training:**

**\*\* to be developed on a project specific basis\*\***

**SECTION 7**  
**QUALITY ASSURANCE / QUALITY CONTROL**

**CIANBRO**

# Quality Certifications

## Quality Management System

### Quality Program Compliant with ISO-9001:2015

Cianbro Corporation has been recognized by the Associated Builders and Contractors, Inc. (ABC) as a 2018 Accredited Quality Contractor (AQC). The AQC program is a third-party national accreditation process that certifies construction firms who have documented their commitment to quality in five key areas of corporate responsibility, including quality, safety, training, employee benefits, and community relations. The AQC program is an annual accreditation and members must renew each year to maintain their status. ABC is a national construction industry trade association and is recognized as the leading organizations representing the merit shop construction industry.

### American Institute of Steel Construction (AISC)

Steel Building Structures  
Simple Steel Bridges  
Major Steel Bridges  
Fracture Critical Endorsement  
Certified Steel Erector (Advanced)  
Sophisticated Paint Coating Endorsement - Enclosed  
Sophisticated Paint Coating Endorsement - Covered



### Precast / Prestressed Concrete Institute (PCI)

Qualified Erector



### The American Society of Mechanical Engineers (ASME)

Pressure Vessels (U)  
Power Boilers (S)



### The National Board of Boiler & Pressure Vessel Inspectors

Repairs and Alterations (R)



### The Society for Protective Coatings (SSPC)

Field Application of Coatings (QP1)  
Lead Based Paint Removal (QP2)



### Experienced & Qualified Team Members

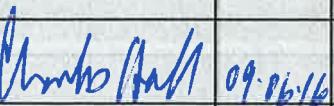
AWS / CWIS  
National Board A Endorsement (AI) Authorized Inspectors  
ASNT NDE Level II & III (VT / MT / PT / UT)  
NACE Level 3 Coatings Inspectors  
SSPC QC Inspectors - Level I  
Certified ISO Internal Auditors  
ACE / NAVFAC QSM Certified  
Certified API Inspectors

**CIANBRO**

# Quality Management Plan

## Third Edition – Revision 1

September 6, 2016

Revisions			
Rev. #	Description		Date
Orig			11/16/07
-	Second Edition		12/13/13
-	Third Edition		
1	Revised Organization Chart		09/06/16
Prepared/Review by:	Signature	Date	<b>GIANBRO</b> Pittsfield, Maine
Director – Quality Assurance		09-06-16	Quality Management Plan
VP Engineering & Estimating	Frank Sui	9/6/16	QA-1001
			1 of 41

**Revisions / Editions**

Revisions to this manual shall be identified as follows: A description of the changes shall be entered below. In the effected sections, changed or deleted text shall be identified by striking through the text. New text shall be in bold face, italicized font. Following proper review and approval, the revision status of the manual shall be updated.

New Editions contain no indication of the changes.

<u>REVISION</u>	<u>DATE</u>	<u>SECTION</u>	<u>DESCRIPTION</u>
—	<u>12/13/13</u>	<u>All</u>	<u>Reissued as Second Edition.</u>
—	<u>01/08/16</u>	<u>All</u>	<u>Reissued as Third Edition. Incorporated 2015 Revision of ISO-9001 and updated content to reflect restructuring of Cianbro along Market based operations.</u>
<u>1</u>	<u>09/06/16</u>	<u>App. B</u>	<u>Revised Organizational Chart (Appendix B)</u>

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# Wind Energy Services - Field Quality Manual

## **Quality Assurance / Quality Control**

Revisions		
Rev. #	Description	Date
Orig		09/2009
1	General revision of forms and procedures, updated references	4/2010
2	To align with new QC-WES Manuals	4/2013
	Job #:	<b>CIANBRO CORPORATION</b> Pittsfield, Maine
Prepared/Review by:	Signature	
Gen. Mgr		
Parker Hadlock		
QSM		
Charles Hall		4.25.2013
		Size: <b>A</b> CAGE:
		1 of 6

## Quality Assurance

### ***Mission***

Quality has been and always will be of paramount importance to the Cianbro team. Quality begins with our people. Our experienced team, training and management techniques will be used to ensure a top quality project. Our mission is simple:

**“Safely deliver a quality product that meets contract specifications to the customer within the time frame allotted.”**

### ***Means and Methods***

Cianbro is responsible for assuring all work is completed in accordance with the contract drawings, standards and specifications. Methods used to achieve that goal are in agreement with sound industrial construction practices and shall be carried out by personnel qualified by training and/or experience to perform their assigned responsibilities.

The Corporate QA/QC Manager is responsible for planning, implementation and auditing the Project Quality Plan. Required documentation, of major construction activities, shall be gathered, organized and turned over to the client as part of the final turnover packages.

A Cianbro team member will be assigned the responsibility as Project QA/QC Representative, to implement the Quality Plan, coordinate inspections and manage documentation. Generally these responsibilities will be assigned to a Project or Field Engineer.

Supervisors shall establish clearly defined expectations and hold all personnel accountable for meeting those expectations. Supervisors shall review the work of all direct reports to sufficiently verify workmanship and adherence to project specifications.

All Quality Assurance & Quality Control requirements of Cianbro's Quality Program are applicable to subcontractors.

### ***Results***

Quality Assurance and Quality Control processes reduce re-work cost and time, reduce down time due to failures and improve the life of the structures. Furthermore, effective management of materials, processes and documentation is crucial to assuring a trouble free turnover of the facilities to the owner at project completion.

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## **SECTIONS / GENERAL TOPICS**

<b><u>General Description</u></b>	<b><u>Plan Identification</u></b>	<b><u>Number of Pages</u></b>
<ul style="list-style-type: none"><li>• <b>Civil Site Work</b><ul style="list-style-type: none"><li>○ Scope and Purpose</li><li>○ References</li><li>○ Responsibilities</li><li>○ Procedure<ul style="list-style-type: none"><li>■ Materials</li><li>■ Surveying &amp; Layout</li><li>■ Excavation</li><li>■ Backfill &amp; Compaction</li><li>■ Establishment of drainage</li><li>■ Inspection &amp; Testing</li></ul></li><li>○ Records</li><li>○ Forms</li></ul></li></ul>	QC-WES-1000	8

## SECTIONS / GENERAL TOPICS

<u>General Description</u>	<u>Plan Identification</u>	<u>Number of Pages</u>
<ul style="list-style-type: none"><li>• <b>Structural Foundations</b><ul style="list-style-type: none"><li>○ Scope and Purpose</li><li>○ References</li><li>○ Responsibilities</li><li>○ Procedure<ul style="list-style-type: none"><li>▪ Excavation &amp; Drainage</li><li>▪ Concrete &amp; Reinforcement</li><li>▪ Mixing &amp; Transportation</li><li>▪ Concrete Placement</li><li>▪ Third Party Inspections</li><li>▪ Concrete Repairs</li><li>▪ Rock Anchors</li></ul></li><li>○ Records</li><li>○ Forms</li></ul></li></ul>	QC-WES-1500	11
<ul style="list-style-type: none"><li>• <b>Underground Collection</b><ul style="list-style-type: none"><li>○ Scope and Purpose</li><li>○ References</li><li>○ Responsibilities</li><li>○ Procedure<ul style="list-style-type: none"><li>▪ Materials</li><li>▪ Underground Collection</li><li>▪ Electrical Components</li><li>▪ Grounding Grid</li><li>▪ Workmanship</li></ul></li><li>○ Records</li><li>○ Forms</li></ul></li></ul>	QC-WES-3000	5
<ul style="list-style-type: none"><li>• <b>Operations &amp; Maintenance</b><ul style="list-style-type: none"><li>○ Scope and Purpose</li><li>○ References</li><li>○ Responsibilities</li><li>○ Procedure<ul style="list-style-type: none"><li>▪ General Requirements</li><li>▪ Site Construction</li></ul></li></ul></li></ul>	QC-WES-4000	8

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- Masonry
- Metals
- Wood & Plastics
- Thermal & Moisture Protection
- Doors & Windows
- Finishes
- Specialties
- Equipment
- Furnishings
- Special Construction
- Conveying Systems
- Mechanical
- Electrical
- Punchlist Inspection
- Records
- Forms

- **Turbine Erection** QC-WES-500
- Scope and Purpose
- References
- Responsibilities
- Procedure
  - General Comments
  - Critical Bolted Assemblies
  - Miscellaneous Components Installation
  - Mechanical Workmanship & Cleanliness
  - Electrical Components
  - Electrical Workmanship
  - Steel Tower Erection
  - Final Torque / Tensioning
  - Equipment Alignment
  - Commissioning & Final Turnover
- Records
- Forms

## DESCRIPTION OF REVISIONS

QC Plan may be revised periodically to update existing procedures or to add additional procedures or Forms.

Revisions to this manual shall be identified as follows:

- Identify the major section(s) of the manual to be revised in the space below (for example: QCP-WP-2000).
- In the affected manual sections; describe the revision(s), in brief detail, in the paragraph provided for “revisions”.
- In the revised “sub-sections”; changed or deleted text shall be identified by striking through the text. *New text shall be in bold face, italicized font.*
- Following proper review and approval, the revision status of the manual shall be updated.

Revision	Quality Manual Section Revised	QC Manager	Date
1	Sections 1000, 2000, 3000, 5000, 6000	<i>Charles Hall</i>	4/26/2010
2	Revised Cover to align with manual	<i>Charles Hall</i>	4/25/2013

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Tube

Cianbro Corporation  
101 Cianbro Square  
Pittsfield, ME 04967



## Exhibit 4.3

### STATEMENT OF QUALIFICATIONS



**EMPOWERING ENERGY SOLUTIONS**  
*for the future...today.*

**HALLOWELL OFFICE**  
267 Whitten Road  
Hallowell, ME 04347  
Phone: 207-621-1077

**FALMOUTH OFFICE**  
360 U.S. Route 1  
Falmouth, ME 04105  
Phone: 207-621-1077



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## COMPANY PROFILE

### Overview & Background

RLC Engineering, LLC (RLC) is an engineering consulting firm located in Hallowell and Falmouth, Maine, offering a full range of services in the electric utility and renewable generation engineering fields, from initial concept to final commissioning. RLC opened its corporate office in 2006 in Augusta, Maine and has experienced steady growth and success since then. In 2016, RLC reached an important milestone celebrating 10 years in business. In 2017, RLC opened its second office in Falmouth, Maine.

### Our Mission

To provide professional consulting services and innovative solutions for our clients, while providing an enriching work environment that encourages personal development and job satisfaction for our employees.

### Who We Are

RLC's team of more than 60 technical professionals provide innovative electrical engineering solutions, tailored to fit the specific needs of each of our clients. Our Engineers bring extensive experience in the study, planning, and design of complex power systems, understanding the need for efficiency, flexibility, attention to detail, and value for money invested. Our Core services include:

- **Power System Studies**
  - Transmission System Studies
  - Distribution System Studies
  - Renewable Energy
- **Power Delivery**
  - Substation Design
  - Transmission Line Design
  - Protection & Control
  - Automation & Integration
- **Power Generation**
  - Solar Generation
  - Wind Generation
  - Hydro Generation
  - Battery Storage
  - CHP
  - Biogas
  - Waste to Energy
  - Biomass

**RLC delivers creative, cost-effective solutions to our clients.**

**We specialize in solving energy and infrastructure related problems.**

**RLC has formed strategic partnerships to allow for EPC Support.**

RLC personnel can work as a supplement to your in-house staff or provide turnkey planning, feasibility studies (site selection, utility interconnections), design, interconnection applications, permitting, and project management services for electrical substations, transmission lines, power generation facilities, and industrial plants.

RLC has provided the following services to the Utility and Power Generation markets (This represents a small sample of our total portfolio):

- System planning and engineering studies for Central Maine Power Company's Maine Power Reliability Program (MPRP), playing a significant role in the planning and construction sequence for MPRP's proposed substation and transmission improvements.
- Planning services for the proposed Hydro Quebec transmission connection into New England.
- Design, management and construction oversight for more than 30 wind power projects across the United States and Canada, and a 62 MWdc solar program totaling 19 sites in New England.
- Multi-discipline design, project management and construction oversight for 12.7kV to 345kV Substations, Transmission and Distribution Protection Systems, Communications Network and A&I Systems.

Services have included interfacing with Utilities, Generating Facilities and the Independent System Operators (ISO-New England, NYISO).

With our comprehensive range of services, RLC will provide expert consulting engineering services to meet your technical, schedule and budgetary requirements.

## RLC SERVICES

### POWER SYSTEM STUDIES

RLC is widely recognized as a leading industry provider of Power System Studies in the Northeast. We perform a full breadth of transmission and distribution system planning and operational studies for electric utilities and energy developers. Owners of T&D systems need to find effective ways to meet mandated reliability standards and power quality requirements while meeting the challenges of grid modernization. With large amounts of distributed energy resources interconnecting and other non-transmission alternatives competing with traditional grid solutions, energy developers, utilities, regulators, and system operators will depend on power system studies to maintain the security and dependability of the electric grid. Clearly, the future grid will look different from that of today. There will be more stakeholders actively involved, requiring system studies to evaluate and manage the myriad of challenges arising from change. RLC's Power System Studies group has decades of electric system operational and planning experience necessary to effectively tackle these challenges.

#### Transmission System Studies

RLC is expert at performing transmission system studies. These studies range from preliminary feasibility studies for energy developers to wide area transmission planning studies to satisfy regional and national reliability standards, and competitive transmission solutions for public policy initiatives. Our engineers have significant experience modeling and planning transmission systems both large and small. RLC maintains a high level of security and confidentiality through security software and internal procedures for handling Critical Energy Infrastructure Information.

#### Distribution System Studies

Distributed energy resources are dramatically changing the design and requirements of the future distribution system. Advances in smart grid technology coupled with high penetration of renewables proposing to interconnect on distribution lines require modeling, study and investigation. The new challenges and advancement in technology require better understanding of both supply and load resources. We have been helping our utility customers by performing distribution interconnection impact

#### RLC STUDIES EXPERTISE INCLUDES:

- ARC FLASH HAZARD ANALYSIS
- CABLE SIZING
- CIRCUIT BREAKER RATING ANALYSIS
- DETAILED LOSS ANALYSIS
- EMF ANALYSES AND MEASUREMENTS
- EVALUATION OF POWER SUPPLIES ALTERNATIVES
- FIELD SURVEYS OF ELECTRICAL FACILITIES
- GENERATION AND EMERGENCY GENERATION ANALYSIS
- GROUNDING ANALYSIS
- HARMONICS ANALYSIS
- HOSTING CAPACITY STUDIES
- INSULATION COORDINATION
- MOTOR START ANALYSIS
- POWER SYSTEMS COMPUTER MODELING AND ANALYSIS
- REACTIVE COMPENSATION ANALYSIS
- SWITCHING SURGE STUDIES

studies and equipment design reviews to ensure and maintain mandatory power quality standards. We also performed a Distribution Hosting Capacity Study for service territories in Maryland.

### **Renewable Energy (Solar, Wind, Battery Storage, etc.)**

The growth of solar, wind and battery renewable energy sources has been brisk the last few years and is likely to continue its high penetration of both small- and large-scale projects. We analyze the integration of these resources onto both transmission and distribution systems through interconnection studies or fatal flaw assessments. We have analyzed interconnections of small and large resources, performed siting and interconnection studies and most recently performed studies for emerging technologies. In addition, we perform congestion analyses to study moving large quantities of renewable energy over long distances.

**Software Applications:** RLC Engineering personnel are competent and knowledgeable users of ASPEN, CYME, PSCAD/ATP, PSS/E, PSLF, SKM Power Tools, Synergi, TARA, as well as our own specialized programs. Additionally, we are fluent in handling Critical Energy Infrastructure Information and always maintain a high level of security and confidentiality through security software and internal procedures.

## **POWER DELIVERY**

---

RLC offers a comprehensive package of engineering, design and estimating services for Substations, Transmission Lines, Protection & Control and Automation & Integration. Our substation and transmission facility design services range from 12.47 kV to 345 kV. RLC's engineers have extensive experience with substation and switchyard design for transmission and distribution systems, as well as experience designing wind farm collector systems, interconnection substations, and transmission facilities for power plant and utility service applications. RLC leverages its design experience in combination with utilizing nationally recognized software (SAGE-Timberline) to support Level 1 through 4 estimating efforts for our Utility and Developer clients.

## **Substation Design**

Whether you need a conceptual bid package or completed for construction documents, our engineers are able to plan, specify, and perform all aspects of preliminary and detailed engineering for transmission, distribution or interconnection substations. We assist our clients in navigating from the conceptual stage into the preliminary stage, followed by the detail design stages to include final design as well as through material procurement, construction and final commissioning.

## **Transmission Line Design**

Our expertise extends from distribution to transmission line design and standards. Our Engineers are qualified to provide transmission line design services and investigations from the conceptual or permitting level through detailed design for construction. We offer a wide range of services including:

- Development of Specification documents (Procurement and Construction)
- Development of Transmission and Distribution System Design and Construction Standards
- Complete drawing package development including project bill of materials
- NERC compliance reviews
- Full structural analysis including foundation design
- Project comparative cost estimating
- Facility thermal ratings and re-ratings analysis
- Construction inspection
- Field investigations

Our customers include major investor-owned utilities through small municipal power owner and operators. Independent of size, they all have the same goal to optimize and maximize the reliability and transfer capability of their power delivery corridors.

## **Protection & Control**

The modernization of the protective relay functions within the electric grid involves a knowledge of power systems and microprocessor based equipment to provide both safe and reliable operation. Legacy equipment replacement with state-of-the-art numerical relays represents a major sector of our business and capabilities. Our relay engineers and designers specify the proper

equipment and set the new relays for secure and dependable operation. Our group is able to coordinate large areas of relay settings to minimize any mis-operation and mitigate undesirable outcomes due to electrical system faults. We have created, reviewed, and approved protective relay settings for numerous relay types and applications and developed construction level control system designs for new and existing facilities.

Our settings group has provided services to include:

- Generator Protection
- Bus Differential Protection
- Line Protection
- Transformer Protection
- Breaker Failure
- PRC Compliance Analysis (PRC-024 thru 27, etc.)

**RLC Engineering also developed and presented a NERC certified training course on the Fundamentals of System Protection for CMP and PSNH System Operators.**

## **Automation & Integration**

RLC Engineering provides automation & integration engineering solutions for utility applications including transmission, distribution, and wind farm generation. We offer a complete package of design, protection & control, and automation & integration services, ranging from simple RTU replacements or additions to comprehensive substation HMIs and fully integrated substations. We have experience with a variety of vendor platforms and operating practices, along with the tools and skills needed to develop, test, and commission your application. RLC also provides an impartial evaluation of vendors and equipment in order to meet each customer's unique specifications and needs.

**Software Applications:** RLC Engineering personnel are competent and knowledgeable users of AcSELerator, ASPEN, AutoCAD, CYME, Enervista, PLS-CADD, PSSE, RISA, RISA 3d, Sage Software, SKM PowerTools, WinIGS and SAGE.

RLC Engineers have relay application and setting experience with most of the microprocessor relays and alarm and control devices commonly used in today's utility applications. RLC Engineering also developed and presented a NERC certified training course on the Fundamentals of System Protection for CMP and PSNH System Operators.

## POWER GENERATION

---

RLC's engineering services cover the full life of a system from concept and feasibility to design and commissioning as well as maintenance support. We provide engineering solutions for complex power systems that serve a variety of energy related technologies, which include Photovoltaic, Wind, Standby and Emergency Generation.

### Solar Generation

Our solar experience on ground mounted, landfill mounted, rooftop and canopies over parking lots is extensive and ranges from small to large-scale projects. Our solar engineering services cover the full life of a system from concept and feasibility to design and commissioning as well as maintenance support. We can assist on behind the meter projects where all the energy is consumed within the host system or on those projects exporting power to the grid and into the energy markets.

We have provided developers with prospecting/development assistance and land acquisition for over 350MWac of systems throughout the Northeastern United States.

Services noted above include but are not limited to the following:

- Site Feasibility Studies with focus on infrastructure
- Preliminary Design including Gap Analysis
- Interconnection Applications (when applicable)
- Detail Design
- Testing and Commissioning support
  - Energization Plans
  - Commissioning Plans
  - Site Support
  - Relay Testing
  - IV Curve Tracing
  - Performance Guarantee Testing
- Training Owner personnel
- O&M System performance monitoring

### Wind Generation

Our wind interconnection experience on both onshore and offshore projects in the Northeast is extensive. We have performed conceptual design studies for projects ranging between 5 and 450 MW in size. RLC has also conducted detail design on over a dozen wind projects ranging from 5 MW to 40 MW.

## **Battery Storage**

Our battery storage interconnection experience in the Northeast has been steadily growing. The market for stand-alone AC-coupled systems and DC-coupled array enhancements has grown significantly in the last year and is expected to accelerate. We have performed conceptual design studies for projects ranging between 1 and 10 MWhr in size. RLC has also completed detailed design and construction support activities for several BESS systems. Furthermore, RLC can provide our clients with a turnkey solution for their battery storage needs from interconnection applications to testing and commissioning of the projects on a single site or program-wide scale.

## **CHP/Cogeneration/Utility Plant Retrofits**

RLC's capabilities include the development/design/commissioning of behind the fence CHP projects for institutions, industry, and commercial entities as well as various prime movers and thermal solutions offerings to ensure efficiency and secure financial savings. From initial feasibility analysis to electrical and mechanical design and implementation, RLC can provide a single source solution. Additionally, RLC has experience in retrofitting existing utility plants for efficiency, compliance, and enhancement programs.

**Software Applications:** RLC Engineering personnel are competent and knowledgeable users of ASPEN, AutoCAD, CYME, Helioscope, PLS-CADD, PSSE, PVsyst, SKM PowerTools, SAGE, SunDAT, and WinIGS.

## CLIENT REFERENCES

### Contact Information

RLC is extremely proud of our established reputation with our clients. Please feel free to contact the following references regarding our performance and services.

### POWER SYSTEM STUDIES

#### **Mr. George Wegh**

*Manager, T&D*  
Eversource Energy  
Phone: 860-728-6179  
E-mail: [george.wegh@eversource.com](mailto:george.wegh@eversource.com)

### POWER DELIVERY

#### **Mr. Jeremy Sherman**

*Capital Projects Manager*  
Brookfield Renewable  
Phone: 617-943-7542  
E-mail: [jeremy.sherman@brookfieldrenewable.com](mailto:jeremy.sherman@brookfieldrenewable.com)

#### **Mr. Bowin Lindgren**

*Capital Projects Manager*  
Eversource Energy Inc.  
Phone: 860-728-4817  
E-mail: [bowin.lindgren@eversource.com](mailto:bowin.lindgren@eversource.com)

### POWER GENERATION

#### **Mr. Todd Presson**

*Chief Executive Officer*  
Jay Cashman, Inc.  
Phone: 617-890-0600  
E-mail: [TPresson@jaycashman.com](mailto:TPresson@jaycashman.com)

#### **Mr. Mark Kimball**

*Project Director, Solar*  
Eversource Energy  
Phone 860-728-4640  
E-mail: [mark.kimball@eversource.com](mailto:mark.kimball@eversource.com)

#### **Mr. Parker Hadlock**

*General Manager*  
Cianbro Corporation  
Phone: 207-487-4116  
E-mail: [PHADLOCK@cianbro.com](mailto:PHADLOCK@cianbro.com)

## RLC EXPERIENCE

### **AVANGRID (CMP) MAINE POWER RELIABILITY PROGRAM**

RLC provided system planning and engineering studies – including report writing and presentation before ISO-New England, Maine Public Utilities Commission and other regulatory stakeholders – for more than 550 miles of preliminary, alternate and selected transmission line routes. We assisted in the preparation of the permit applications for the Maine Department of Environmental Protection as well as other local and state permitting bodies. RLC also played a significant role in the construction sequence and planning for the MPRP proposed substation and transmission improvements.

RLC has performed numerous analyses of MPRP's potential impact on existing CMP substation facilities, including these studies:

- Steady State Impacts on existing station equipment bus, breaker and switch configurations;
- Fault Current Impacts on circuit breaker duty ratings, circuit breaker transient recovery voltage (TRV), bus support insulators, disconnect switches, grounding switches, line traps, capacitor banks, and shunt capacitors;
- System Impacts on protection relays, shunt capacitor settings, line relay applications, SPS systems, series capacitor, ground relay polarization and out-of-step stability.

### **EVERSOURCE ENERGY NEW ENGLAND EAST WEST SOLUTION**

RLC provided reliability assessment of steady state and stability performance, including report writing and presentation before ISO-New England on the NEEWS Projects. We prepared the study reports and played a significant role in the I.3.9 review and approval process with the Transmission and Stability Task Force Groups.

## **AVANGRID (UNITED ILLUMINATING) GRAND AVENUE RELAY SETTINGS**

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RLC developed the relay settings for the Grand Avenue Substation Replacement Project. Services provided by RLC for this project included the development of relay setting files, the associated relay setting calculations and written descriptions of the relay settings related to the construction of the new Grand Ave. gas-insulated substation. This project also included providing the settings for the new Grand Ave. substation as well as the remote line terminals for each of the seven 115 kV transmission lines that terminate at Grand Ave.

## **RENEWABLE ENERGY PROJECT EXPERIENCE**

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RLC engineers have significant experience in the design, management, and procurement and construction oversight of interconnection facilities associated with wind projects including collector systems, transmission lines, interconnection substations, protective relaying and communication needs. We have also evaluated more than a dozen proposed distributed generation projects in Massachusetts, Connecticut, and Vermont under state tariff regulations and requirements. RLC is knowledgeable and familiar with IEEE 1547 Standard for Interconnecting Distributed Resources.

Recently, our engineers have worked on the following renewable energy related projects:

### **NEW ENGLAND (MAINE)**

- Various Locations, MA – recently completed 62 MWdc solar program in which we served as Owner's Engineer and Interconnection Process technical lead as well as performed design, management and construction oversight for a total of 19 sites including ground mounts and canopies
- Franklin County, MA - Bear Swamp Capacitor Bank Scoping Document and +-10% Capital Cost Estimate
- Millinocket, ME – 2018 Millinocket and Dolby Station Modifications Project - Relay Settings Development
- Freedom, ME – 4.5 MW wind project – detailed design and construction management of 34.5 kV collector system and 34.5 kV interconnection
- Canton, ME – 51 MW wind project – conceptual design of 34.5 kV collection system and interconnection

- Vinalhaven Island, ME – 4.5 MW wind project – detailed design of 12.47 kV collector system and 34.5/12.47 kV Substation upgrade
- Highland Plantation, ME – 156 MW wind project - preliminary design of 34.5 kV collector system, 115/34.5kV collector substation, and 115 kV transmission line
- Roxbury, ME – 55 MW wind project – conceptual design of common utility/collector system substation and alternative interconnection assessment
- Saddleback Mountain, ME – 34.5 MW wind project – preliminary & detailed design of 34.5 kV collection system and interconnection
- Kibby Wind Project – conducted short circuit, coordination and arc flash hazard analysis
- Kibby Wind Project – designed and guided implementation of an integrated voltage control system
- Woodstock, ME – 20 MW wind project – detailed design, construction management, and commissioning of 34.5 kV aerial and underground collection system and interconnection
- Township 16, ME – 34.2 MW wind project – preliminary design of 34.5 kV collector system interconnection
- Oakfield, ME – 141 MW wind project – revised preliminary collector and interconnection design to accommodate change to larger wind turbine

## NEW ENGLAND (OTHER)

- Nantucket Sound – 462 MW wind project – evaluated transmission issues
- Coos County, NH – 99 MW wind project – preliminary design of 34.5 kV collector system, 115/34.5kV collector substation, 115 kV 3 breaker ring bus interconnection substation and 115 kV transmission line
- Adams, MA – 24 MW wind project – conceptual design of 34.5 kV collection system and interconnection
- Brodie Mountain, MA – 15 MW wind project – 23 kV distribution system impact analysis
- Greenfield, MA – 1.5 MW Axio Green photovoltaic project 13.8 kV distribution system impact analysis
- Pittsfield, MA – 1.5 MW Silver Lake photovoltaic project – 23 kV distribution system impact analysis
- Pittsfield, MA – 2.0 MW Pittsfield Sanitary District photovoltaic project – 23 kV distribution system impact analysis
- Georgia Mountain, VT – 10 MW wind project – conceptual and detailed design of 34.5 kV collection system and interconnection

**RLC Engineering has delivered renewable energy services throughout Maine, New England, and Canada.**

- Lowell, VT – 42 MW wind project – conceptual design of 34.5 kV collection system and interconnection
- Lowell, VT – 63 MW wind project – preliminary and detailed design of 34.5 kV aerial and underground collection system, collector substation and upgrades to other local 46 kV substations
- Rutland, VT – 85.5 MW wind project – conceptual design of 34.5 kV collection system and interconnection
- Searsburg, VT – 45 MW wind project – preliminary design of 34.5 kV collector system and 69/34.5kV collector substation
- Sheffield, VT – 40 MW wind project – transmission/interconnection testimony on system impact
- Bristol, New Hampshire – 80 MW wind project – Conceptual design of 230 kV interconnection substation and 34.5 kV collector system
- Ferdinand, Vermont – 91 MW wind project – Conceptual design of 115 kV interconnection substation and 34.5 kV collection system

## CANADA

- Norway, PEI – 9 MW wind project – detailed design and construction management of 34.5 kV collector system and 69/34.5 kV collector substation
- West Cape, PEI – 99 MW wind project – detailed design and construction management of 34.5 kV collector system and 138/34.5 kV collector substation
- Mont Copper, Quebec – assessment of 34.5 kV collector system

## CLIENTS

### **EMERA MAINE (BANGOR HYDRO ELECTRIC)**

Downeast Reliability Study; Mount Desert Island Area Study; Keene Road Operational Studies; Merchant Transmission Study; Chester SVC Re-tuning Study; Bulk Power System Classification Study; and Downeast Voltage Study.

### **AVANGRID (CENTRAL MAINE POWER)**

Planning studies, MPUC licensing support, and engineering studies for Maine Power Reliability Program; Non-transmission Alternative Assessments for Mid-Coast and Portland regions; MPUC licensing support for the Lewiston Loop Project; SCADA Integration and Automation for Saco Bay Reinforcement; and Western Maine Renewables Integration Study.

### **ISO-NEW ENGLAND**

System Impact Studies for Stetson and Rollins Wind Farm, Jimmy and Owl Wind Farm, Kibby Wind Farm, Passadumkeag Wind Farm, Oakfield Wind Farm, Record Hill Wind Farm, Longfellow Wind Farm, Stony Brook II, and Kingdom Community Wind Farm Projects; transfer limit analyses; and Short-Circuit Database Manager and Engineering Analyst of Short-circuit Issues.

### **NEW YORK ISO**

System Reliability Impact Studies for renewable energy projects and for general system improvements.

### **BROOKFIELD RENEWABLE**

Engineering Services for development of protection settings required to support energization of Dolby Hydro Station; Cost Estimate to expand Capacitor Bank from 53 to 63MVar, and add second 63MVar Capacitor Bank at Bear Swamp Substation.

### **EVERSOURCE ENERGY**

System Impact Studies for New England East West Solution; NERC Steady State and Stability Assessments for 2008, 2009, 2010 and 2011; Photovoltaic System Impact Studies on Western Massachusetts Distribution System; Relay Replacement Projects through Protection and Control Services Contract; Agawam Relay Settings (61850 Compliant Site); and Black Start Switching Study.

## **AVANGRID (THE UNITED ILLUMINATING COMPANY)**

Grand Avenue Relay Settings for Substation Replacement Project; Bulk Power System Classification Study; Optimal Transformer Tap Study; NERC Stability Assessment.

## **PATRIOT RENEWABLES**

Beaver Wind Farm Design and Construction; Spruce Mountain Wind Farm Design and Construction; Carthage Preliminary Design for Permitting; Canton Preliminary Design for Permitting.

## **FOX ISLAND ELECTRIC COMPANY**

Vinalhaven Wind Farm Design and Construction.

## **VERMONT ELECTRIC COMPANY**

Jay Tap 115/46 kV Area Study; Burton Hill Capacitor Analysis.

## **INDEPENDENCE WIND**

Highland Wind Preliminary Interconnection Design for Permitting; Record Hill Interconnection Evaluation and Alternatives.

## **FIRST WIND**

Bull Hill Wind Preliminary Interconnection Design for Permitting; Oakfield Preliminary Design Revision for Wind Turbine Change.

## **GEORGIA MOUNTAIN COMMUNITY WIND**

Milton, Vermont Wind Farm Interconnection Design and Construction.

## PRINCIPAL BIOS

### **Rick Conant, PE – Member-Manager**

As the Member-Manager and Founder of RLC Engineering, LLC, Rick offers utility providers and developers a rich background of power system studies and power delivery engineering excellence. With over 30 years of experience in the electric utility industry, Rick provides clients with a diverse knowledge of power system operation from both a planning and operational perspective in tandem with exceptional professional engineering. Rick is integrally involved in the day-to-day management of RLC's two offices, heads a team of more than 60 technical professionals, and works in close collaboration with RLC clients on numerous projects.

### **Waine Whittier, PE – Manager of Power System Studies**

With more than 40 years of utility management, planning and engineering experience under his belt, Waine is expert at power system planning, project planning and financial analysis. Waine manages the Power System Studies group and is responsible for power system economic analyses including congestion analysis. He has provided expert testimony before FERC and state regulatory agencies. Waine is an accomplished engineer with more than 20 years of consulting experience in the United States and Europe, including the countries of Bulgaria, Czech Republic, Russia, Ukraine, Kazakhstan, and Poland.

### **Phil Nadeau, PE, PMP – Manager of Power Delivery**

Phil is a Principal Electrical Engineer at RLC, registered as an Electrical PE and a certified Project Management Professional. Throughout his 30-year career, Phil has managed projects ranging from \$10k-\$50MM within the utility, heavy industry, light manufacturing, food and beverage, pharmaceutical, commercial and government sectors. Phil's expertise is in the management of technical, non-technical, salaried and hourly resources; management of all project phases including safety, feasibility studies, conceptual design, detail design, bid document development, contract negotiations, construction management, testing & commissioning and training. Overseeing the Engineering & Transmission Design group at RLC, Phil works with both the client and our in-house team from a projects initial concept to final commissioning.

### **Tedd Gifford, PE – Manager of Power Generation & Engineering**

Tedd has over 35 years of combined experience in the energy, utilities, industrial, commercial, municipal, educational, nuclear and governmental industries. As Principal Electrical Engineer for Distributed Generation Impact Studies at RLC, Tedd manages studies for various utilities to assess the impact on utility distribution circuits including back feed into substation and transmission lines for solar, wind and synchronous generators. Tedd also works together with RLC's principals when implementing a strategic plan or developing a new business plan.

### **David Estey, PE – Principal Electrical Engineer**

Dave is a Principal Electrical Engineer with over 40 years of experience in the electric utility industry; combining superb engineering services with a solid understanding of power and control systems, Demand Side Management (DSM), generator interconnection systems, renewable energy resources, distributed generation and electric service rates and issues. He is experienced with comprehensive power flow and short circuit analysis, arc flash hazard analysis, and system impact studies for high and medium voltage electric power systems and has specified, designed and commissioned interconnection facilities along with balance of plant power and control systems for utility scale wind and photovoltaic power projects throughout the Northeast and sites in the Southwest.

## Exhibit 4.5



### CORPORATE PROFILE

Since 1995, Strum has been providing integrated services to land developers, corporate entities, and energy clients across Atlantic Canada. With a staff of 55 engineers, surveyors, environmental scientists, and technicians, Strum has on-going projects across Atlantic Canada as well as Quebec, Alberta, and British Columbia. In each of our key Industry offerings, we strive to deliver Client oriented **Solutions that Make Sense!**



Strum provides **Civil Design and Land Development** services for a wide range of commercial developers. From approvals and permits to conceptual and final design, Strum ensures expert advisory on proposed development and re-development projects aimed at optimizing commercial site value. Strum also provides **Legal** and **Topographic Surveying**. Existing projects include commercial and large residential developments such as Bedford West (2500 homes). Strum is providing civil design and environmental services on a new 45 million DND Amoury, as well as a DND Drill Shed and the Dartmouth 4 Pad.

A leader in **Environmental Impact Assessment**, Strum excels at coordinating Federal and Provincial Approvals on large projects. Our specialists conduct biophysical assessments such as wetland and stream characterization, species at risk, benthic and fish studies, and bird inventories. Our team will undertake compensation planning, conduct Environment Effects Monitoring and develop Environmental Protection Plans tailored to your project's unique situation, ensuring timely Regulatory Compliance.

Currently, Strum is combining its environmental and engineering capabilities as an integral part of a number of **Commercial**, **Mining**, and **Alternative Energy** projects. Strum projects include civil design on several Halifax office towers, multi-tenant commercial developments, and two mining projects in Labrador. Other projects include a Marine Terminal, an Oil and Gas Pipeline project in Alberta, an LNG Export Facility in NS and several commercial wind projects. Strum coordinated the Maritimes Link EIA, undertook several GPS Database Inventories for HRM and is completing a Tidal Energy project EA in Nova Scotia.



Strum offers **Contaminated Site Assessment** in support of acquisitions, divestitures, or ongoing property development. Working for banks, lenders, and commercial clients, we provide Phased Site Assessment, clean-up supervision at contaminated sites, and Hazardous Materials Management. Strum has expertise in Brownfield site characterization and development, applying risk assessment and other **Remedial** capabilities to achieve environmental site closure, while preparing the site for redevelopment.

Strum provides a coordinated, hands-on approach to meeting our client needs. We call it, **Taking Charge!**

**Head Office**  
Railside, 1355 Bedford Hwy.  
Bedford, NS B4A 1C5  
**t.** 902.835.5560 **(24/7)**  
**f.** 902.835.5574

**Antigonish Office**  
3-A Vincent's Way  
Antigonish, NS B2G 2X3  
**t.** 902.863.1465 **(24/7)**  
**f.** 902.863.1389

**Moncton Office**  
45 Price Street  
Moncton, NB E1A 3R1  
**t.** 1.855.770.5560 **(24/7)**  
**f.** 902.835.5574

**Deer Lake Office**  
101 Nichol'sville Road  
Deer Lake, NL A8A 1V5  
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# ENVIRONMENTAL ASSESSMENT

Strum works with Government, Industry, and Construction clients to provide assistance with environmental requirements for a wide range of projects.

## KEY SERVICES

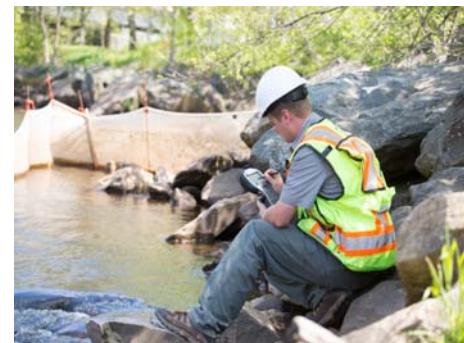
### Environmental Planning

- Risk Assessment
- Fatal Flaw Analyses
- Site Planning (roads, structure placement)
- Regulatory Process Coordination and Consultation
- Construction Planning and Coordination



### Environmental Approvals

- Water Renewal Applications and Reporting
- Wetland Alteration Approvals
- Watercourse Alteration Approvals
- Environmental Management/Protection Plans (EMP/EPP)
- Groundwater Supply Development Approvals



### Environmental Assessment

- Environmental Assessment Reporting (Provincial and Federal levels)
- Environmental Baseline Studies
- Noise Assessment
- Viewscape Assessment
- Wetland Functional Assessment
- Mitigation Planning
- Stakeholder & Public Consultation (openhouses, website creation/management)



### Mitigation

- *Fisheries Act* Habitat Offsetting
- Bird Habitat Compensation Planning
- Wetland Compensation and Restoration
- Monitoring and Follow-up (planning and implementation)

### Strum Project Experience

- 100 MW South Canoe Wind Project
- Melford Marine Terminal
- Maritime Link Subsea Transmission Line
- Nova Scotia Power Transmission Line Upgrades
- Halifax Water Infrastructure Survey & GIS Development
- Offshore Oil & Gas Seismic Environmental Assessment



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## ENVIRONMENTAL APPROVALS

Strum works with Developers, the Construction Industry, Energy clients, and a wide range of Large Project proponents to assist each in characterizing the physical environment and gaining approvals to advance their interests. A key strength lies in our ability to understand our client's needs. This saves time and cost over the long run and ensures that approvals are developed in a timely fashion, getting those projects underway early.

### CLIENT SERVICES

#### Site Developers

- Baseline Biophysical Studies
- Wetland Delineation
- Wetland Alteration Approvals
- Watercourse Alterations
- Groundwater Supply Development
- Mitigation Plans



#### Commercial and Construction Sites

- Environmental Protection Plans (EPP)
- Compensation Planning and Coordination
- Fisheries Act Authorization and *Serious Harm* Compensation
- Federal Environmental Assessment (in accordance with CEAA 2012)
- Environmental Impact Statements (EIS)
- Fatal Flaws Analysis



#### Energy Projects

- Tidal and Wind Project Approvals
- Land and Marine Compensation
- Wetland Restoration
- Fauna and Flora Studies
- Oil and Gas Studies, Seismic EA
- Hydro Power



#### Strum Project Experience

- 100 MW South Canoe Wind Project
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**f.** 902.863.1389

**Moncton Office**  
45 Price Street  
Moncton, NB E1A 3R1  
**t.** 506.850.9314  
**f.** 902.835.5574

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## WIND ENERGY PROJECTS

Strum Consulting is playing a leading role in Wind Energy development across Atlantic Canada. With projects in all four provinces, Strum is presently providing a wide range of services to over 25 projects ranging from 2 to 101 MW. Clients include Energy companies, private developers, First Nations developers, and others. Strum can assist with any or all aspects of these projects to bring your project to fruition in the shortest possible time.

### KEY SERVICES

#### Preliminary Studies

- Fatal Flaw Analysis
- Environmental Impact Studies
- Preliminary Site Screening
- COMFIT Application Support



#### Comprehensive Studies

- Environmental Impact Assessment (EIA)
- Environmental Protection Plans
- Long Term Monitoring Programs
- Regulatory Process Coordination



#### Biophysical Assessment

- Fauna and Flora Studies
- Wetlands and Watercourse Assessment/Permitting
- Bird, Bat, and Large Mammal Studies



#### Impact Studies

- Photo Montage, View Plane Analysis
- Noise Studies, Radar Interference
- Power Easement Routing Plans
- Transport Studies, Shadow Flicker



#### Engineering and Construction

- Land Easement Negotiations
- Legal, Topographic, and Construction surveying, LIDAR
- Road Layout, Civil Design, Tendering and Materials Specifications
- Construction Support

#### Public Consultation

- Public Engagement and Facilitation
- First Nations Consultation
- Open Houses
- Website Development

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## PROFESSIONAL ASSOCIATIONS

- Environmental Services Association of Nova Scotia (ESANS)
- Canadian Land Reclamation Association (former Board Member)
- Halifax Chamber of Commerce
- OTANS member

## AREAS OF SPECIALIZATION

- Project Management
- Environmental Impact Assessment
- Public and Regulatory Consultation
- Permitting
- Infrastructure Planning and Construction
- Environmental Management System
- Natural Resource Inventories

## RELEVANT EXPERIENCE

Mr. Duncan is currently the Vice-President of Business Development at Strum based in Bedford Nova Scotia. Shawn has also worked for both provincial and federal government departments, as well as having senior environmental experience in the private sector for the oil and gas industry. He has worked professionally in the environmental field throughout Canada and internationally for 29 years. His areas of specialization include project planning and management, environmental impact assessment, infrastructure planning and construction, public consultation and regulatory support.

## REPRESENTATIVE PROJECTS AND ROLES

### NATURAL RESOURCE INVENTORIES AND SURVEYS:

**Environmental Effects Monitoring Programs, Paper Mills (NB) - Project Manager:** Involved in the development, design, and implementation of EEM programs for five pulp mills that were required under federal regulations. These programs were multi-year in scope and involved both freshwater and marine systems.

**Assessment of Downstream Fish Migration (NB) - Field Coordinator:** Involved in the study of the downstream migration patterns of juvenile blue-backed herring and alewife on the St. John River.

**Fish Habitat Assessments (NS and NB) - Program Manager:** Coordinated a fish habitat assessment program that assessed over 500 watercourses that intersected a proposed pipeline corridor, in support of the EIA and provincial and federal permitting.

**Aerial Moose Survey (NB) - Program Manager:** Managed and conducted a provincial aerial winter survey for moose, using helicopter.

**Development of Watershed Management Plan, Keswick River (NB) - Program Manager:** Developed a watershed management plan for the Keswick River System in conjunction with the federal Department of Fisheries and Oceans.

### EDUCATION

- BSc., McGill University, Montreal (1990)

### TRAINING

- M.Eng. (pending), University of New Brunswick, Fredericton
- CEAA Screening Training
- Contaminated Sites Assessment and Clean-up
- EMS and Project Planning
- Conflict Management and Dispute Resolution
- Project Management Bootcamp, 2007
- ISO 14001 Orientation

**Numerous Fisheries and Aquatic Habitat Surveys (NS and NB) - Project Manager:** Coordinated a number of freshwater fisheries and aquatic habitat surveys throughout the Atlantic provinces to provide baseline and monitoring data for a number of projects and developments.

**Identification of Fish Habitat Improvement Opportunities (NB) - Project Manager:** Identified particularly beneficial opportunities for fish habitat improvement in New Brunswick, and determined strategies for project implementation.

**Development of Fisheries Management Plans, Recreational Fisheries Developments (NB) - Technical Support:** Involved in the preparation of fisheries management plans to provide improved recreational salmonid fishing on private landholdings.

**Tropical Ecology, Bellairs Institute (Barbados) - Field Assistant:** Attended a field course on tropical ecology and participated in research surveys of mangrove environments, reef ecosystems, and marine fisheries.

**Fish Behavioural Study, St. Andrews (NB) - Field Assistant:** Conducted a two-month study underwater survey to observe the behaviour of juvenile Pollock under induced threat from predation.

**Marine Benthic Habitat Surveys (NS and NB) - Field Assistant:** Conducted a number of marine benthic habitat and sampling surveys for the federal government to support dredging or wharf construction activities.

## **ENVIRONMENTAL ASSESSMENTS:**

**Sydney Tar Ponds Environmental Impact Statement, Sydney (NS) - Manager:** Mr. Duncan managed the EIS for the cleanup, which involved managing a large team of professionals, working closely with the proponent and their engineering consultant to prepare the 7-volume EIS for submission to federal and provincial regulators. Components included public and regulatory consultation, environmental baseline field work and human and ecological risk assessments. He also provided testimony during the three week public hearing process as part of a joint review panel.

**Environmental Impact Assessment, Keltic Petrochemical and LNG Facilities, (NS) - Project Manager:** Mr. Duncan acted as Project Manager for the preparation of a provincial EIA and a federal CSR for this combined petrochemical and LNG project. Managed a large consulting team and coordinated consultation with the public, stakeholders, and the regulatory agencies. Shawn also acted as panel lead at the 8-day provincial hearings that were part of the NS review process.

**Fundy Tidal Energy Project (NB) - Senior Technical Reviewer:** Mr. Duncan provided senior technical input and senior review for the combined federal and provincial EA that was required as part of the Fundy Tidal Energy Project.

**Environmental Assessment, NB DoT, Route #11(NB) - Senior Reviewer:** Mr. Duncan acted as the senior reviewer for a provincial EA for a new 4 lane highway in northern NB. This Project also included compliance with the federal CEA Act and required a number of natural resource surveys.

**Federal Comprehensive Study Report, Hamilton Harbour Clean-up (ON) - Project Manager:** Mr. Duncan was the Project Manager and Senior Technical Reviewer for the federal CSR that was required as part of the Randle Reef Project in Hamilton Harbour.

**Environmental Impact Assessment, 25 MW Windfarm, Canso, (NS) - Project Manager:** Mr. Duncan conducted the environmental impact assessment for a windfarm and associated infrastructure. Components included public and regulatory consultation, environmental baseline field work, turbine site selection, and environmental impact assessment.

**Joint Federal-Provincial Environmental Assessment (Comprehensive Study) for the Black Point Quarry Project, Erdene Resource Development Corp (NS) - Project Director:** Mr. Duncan was the Project Director responsible for senior review and client management for the environmental assessment project and EA scoping; scoping and coordination of field studies; regulatory and public consultation plans; and report preparation.

**Environmental Impact Assessment, Power Generating Facilities (Barbados) - Project Manager:** Mr. Duncan was the Project Manager for the environmental impact assessment for a 250 MW power production facility and associated transmission line. Options that were considered for the facility fuel design included low-speed diesel engines and natural gas engines. Components included public and regulatory consultation, environmental baseline field work, and environmental impact assessment.

**Environmental Assessment, Maritimes & Northeast Pipeline, Mainline Expansion (NS and NB) - Project Manager:** Mr. Duncan provided project management and development of the federal CEAA screenings for four compressor stations. This involved detailed site selection, field surveys and public, regulatory, and First Nations consultation programs.

**Environmental Impact Assessment, Terminal and Pipeline Facilities (Barbados) - Project Manager:** Mr. Duncan prepared the EIA for a petroleum terminal facility and associated transmission pipelines. The existing bulk storage facilities were relocated from a coastal location in Oistins to a location near the airport. Components included public and regulatory consultation, environmental baseline field work, and pipeline route selection.

**Environmental Impact Assessment, Windfarm (Barbados) - Project Manager:** Mr. Duncan conducted the Environmental Impact Assessment for a windfarm near Lamberts, Barbados. The project consisted of eleven 900 kW wind turbines. The EIA included public and regulatory consultation, environmental baseline field work, and environmental impact assessment.

**Environmental Impact Assessment, Prison Facility (Barbados) - Project Manager:** Mr. Duncan prepared the Environmental Assessment for a new prison facility in Dodds, St. Philip. The previous prison was destroyed by fire and therefore there was an accelerated timeline to build a new facility to house the inmates. The EIA was completed ahead of schedule.

**Environmental Impact Assessment, Natural Gas Pipeline Route, Country Harbour, Nova Scotia to St. Stephen, New Brunswick - Assessor:** Mr. Duncan participated in the technical aspects of the corridor selection and environmental impact assessment of a 558 km pipeline, which included providing input on the definition of VECs, prediction of environmental effects, identification and analysis of design and route alternatives, socioeconomic impacts, contingency planning and compensation.

#### **ENERGY RELATED EXPERIENCE:**

**Regulatory Support and Joint Public Review, Sable Offshore Energy and Maritimes & Northeast Pipeline - Technical Support:** Mr. Duncan participated in, and provided environmental support to expert witness panel members testifying before a Joint Public Review Panel which included representatives of the National Energy Board.

**Detailed Route Assessment and Hearings Maritimes & Northeast Pipeline - Technical Support:** Mr. Duncan conducted a detailed analysis for the routing of the detailed 25 m easement for the mainline 30-inch pipeline. He also provided technical support for a detailed regulatory review of this easement through a NEB panel review process.

**Environmental Protection Plan, Maritimes & Northeast Pipeline - Management/Technical Support:** Mr. Duncan provided management and technical support for the development of an environmental protection plan for construction of 550 km of 30 inch natural gas transmission pipeline. Construction practices and protection measures were outlined in the EPP which would minimize potential impacts to the receiving environment.

**Maritimes & Northeast Pipeline - Construction Supervisor:** For the construction of the M&NP mainline and the Halifax lateral, Mr. Duncan fulfilled the role of construction supervisor. He provided supervision of a team of 20 environmental inspectors to oversee the implementation of environmental commitments and regulatory requirements during construction activities.

**Duke Energy, Environment, Health and Safety Audit, Natural Gas Distribution and Processing Facilities, Fort Nelson, British Columbia, and Northwestern Ontario - Lead Assessor:** Mr. Duncan conducted an EH&S compliance audit of distribution pipeline facilities in Ontario, and a gas processing facility in Fort Nelson. He verified compliance with applicable provincial and federal legislation and/or permits related to environmental and health and safety requirements for these types of facilities.

**Comprehensive Study, Halifax Lateral, Maritimes & Northeast Pipeline - Management/Technical Reviewer:** Mr. Duncan provided management support and technical review of a comprehensive EIA for the construction and operation of 120 km of 12 inch natural gas pipeline into Halifax. Shawn also acted as the construction supervisor to oversee the implementation of required environmental measures.

**Pipeline Evaluation and Coastal Mapping, Orimulsion Pipeline (NB) - Project Manager:** Mr. Duncan was involved in the evaluation of an Orimulsion pipeline and the development of a coastal mapping for use in contingency and spill response planning for the transportation of Orimulsion. The Orimulsion was being transported to the NB Power generating station in Dalhousie New Brunswick.

## **ENVIRONMENTAL MANAGEMENT:**

**Sydney Tar Ponds Remediation - Project Director and Regulatory Manager:** Mr. Duncan fulfilled these senior roles during the Detailed Design of the Sydney Tar Ponds Clean-up and for the ongoing Construction Administration and Oversight for this Project.

**Inventory of Fish Processing Facilities, Environment Canada, Atlantic Provinces - Project Manager:** Managed a project that compiled and evaluated data and information of fish processing facilities in the Maritimes with the intent to evaluate waste treatment procedures for these operations.

**Acid Rock Mitigation and Construction Response Plan, Maritimes & Northeast Pipeline - Technical Support:** Participated in the development and implementation of a unique approach to the handling of acid rock during the planning and construction of the pipeline. A construction response plan (CRP) was developed in conjunction with regulators that addressed the identification, handling, and disposal of acid rock encountered during construction. In addition, the CRP outlined mitigation and risk analysis procedures that were developed for treatment of acid rock to be left on-site.

**Environmental Evaluation and Management, Canadian International Development Agency (India) - Technical Support:** Assisted CIDA and the government of India in identifying hazardous waste streams and developing treatment strategies.

**Environmental Sensitivity Atlas, Baie de Chaleur (NB) - Assessor:** Collected environmental information for the Baie de Chaleur region and used it to produce environmental sensitivity mapping for the region to support spill response planning.

**Inland Waters and Coastal Oceanographic Information Network (NB) - Technical Support:** Provided technical support for a project to develop and apply an environmental information system for the Bay of Fundy and Chaleur Bay regions. The system combines metafiles, a knowledge-based system and a geographical information system. It is used both for EIAs of proposed projects and contingency planning and to identify development opportunities.

**Corporate EMS, Industrial Client - Project Manager:** Developed and provided implementation guidance for a corporate environmental management system that closely followed the requirements as set out in the ISO 14001 CSA standard.

**Environmental Performance Evaluation Training (India) - Technical Support:** Provided technical input and conducted training to environmental professionals in India to provide an overview of EPE and the requirements under the ISO 14031 CSA standard.

**Wilderness Recreation Potential Assessment, Halifax (NS) - Project Manager:** Prepared an assessment of the potential for wilderness recreational use of a forest area that will be bisected by the proposed Highway #113.

## AREAS OF SPECIALIZATION

- Project Management
- GIS Analysis
- Flora and Fauna Surveys
- Wetland Specialist
- Avian Surveys
- Habitat Characterization
- Wetland Delineations, Functional Assessments, Post-Alteration Monitoring and Post-Creation Monitoring
- Ambient Sound Assessments

## RELEVANT EXPERIENCE

Mr. Dickey joined the Strum team in 2012. He received his Masters of Resource and Environmental Management degree from Dalhousie University that same year. While studying at Dalhousie, Scott specialized in the environmental assessment of renewable energy technologies, and natural resource management in Nova Scotia. Scott also obtained his Bachelor of Science degree in 2009 from Mount Saint Vincent University. Here he specialized in botany and wetland ecology. He focused on the population genetics of the globally imperilled Long's Bulrush (*Scirpus longii*) for his Honours thesis.

Scott is active in managing consulting projects, conducting environmental assessments, conducting wetland delineations and alterations, completing flora and fauna surveys, avian assessments, and other ecological studies. He is knowledgeable with provincial and federal approvals processes and works closely with senior staff to prepare reports and regulatory submissions.

Scott held a previous position with Nova Scotia Power Inc. (NSPI) as an ecological consultant. He developed water management strategies to improve the environmental performance on a selection of NSPI's hydro-electric power systems. Scott also worked with Environment Canada as an environmental researcher, where he assisted with a number of watershed management projects related to pesticide usage by the agricultural industry on Prince Edward Island.

## REPRESENTATIVE PROJECTS AND ROLES

**Power Generating Station Benthic and Mixing Zone Studies (NS), 2013 – Project Coordinator/Field Biologist:**  
 An ecological assessment was completed to evaluate ecosystems in three water bodies, which receive effluents from the Generating Station and associated operations. The assessment incorporated an evaluation of benthic community composition (i.e., benthic macro-invertebrates and macrophytes), as well as a characterization of habitat in the receiving waters. The ecological assessment was completed simultaneously with a mixing zone study, which was designed to provide guidance on determining effluent discharge limits outlined in the Operating Approval for the Generating Station, by determining concentrations of compliance parameters in the mixing zones of receiving waters. Scott has been involved in all aspects of the Project including study design, the coordination and completion of the field programs, data management, reporting, and general project management.

**Maritime Link Transmission Line Watercourse Assessment (NS), 2013- 2014 - Project Coordinator/Field Biologist:** The scope of this project includes the design and coordination of desktop and field programs to assess watercourse crossings and fish habitat along the footprint of transmission and grounding lines for the purpose of

## EDUCATION

- Masters of Resource and Environmental Management (MREM) - Dalhousie University, Halifax, NS (2012)
- Bachelor of Science (Honours in Biology) - Mount Saint Vincent University, Halifax, NS (2009)

## TRAINING

- Project Management for Environmental Professionals - Eco Canada (2013)
- Risk Communication and Conflict Resolution Training - Eco Canada (2013)
- First Aid & CPR Level A - St. John's Ambulance (2013)
- WHMIS Certification - Construction Safety Association of Nova Scotia (2012)
- Certification in GIS Analysis Software - ESRI Canada (2011)
- Over 80 Hours of Project Management Coursework - Dalhousie University's Faculty of Management (2010 -2011)

construction planning and permitting. This involved the identification and assessment of watercourses within the 90 km (combined) transmission and grounding line corridors in Cape Breton, as well as all associated site facilities and access roads. Scott was responsible for completing field assessments including fish habitat and fish population assessment, preparation and maintenance of field data, and general communications.

**Canso Spaceport Environmental Assessment (NS), 2018 – Environmental Scientist:** Completed ecological assessments including avian assessments, contributed to the Project's environmental assessment, and completed ambient sound assessments.

**South Canoe Wind Project (NS), 2012-2018 - Environmental Scientist:** Completed wetland assessments, Completed wetland assessments, flora and fauna surveys, ambient sound assessments, wind turbine sound warranty tests as well as assisted in geotechnical assessments.

**Aulds Cove Avian Assessment (NS), 2016 – Avian Ecologist:** Completed avian studies and risk analysis.

**South Canoe Wetland Compensation Research Project (NS), 2014-2016 – Environmental Scientist:** Completed a comprehensive research project as partial fulfillment of the wetland compensation requirement for the South Canoe Wind Project's wetland alteration. This included a comprehensive assessment and monitoring program of a number of reference wetland sites in Nova Scotia, as well as GIS analysis, vegetation, soil and hydrology data analysis and reporting for the Project.

**Windsor Forks Wetland Compensation Project (NS), 2014-2018 – Environmental Scientist:** Contributed to the design and construction of a wetland creation project in which a wetland was created in the site of a quarry near Windsor Nova Scotia.

**Martock Community Wind Project (NS), 2012 - Wetland Delineator/Environmental Specialist** Completed wetland : Completed environmental assessments, wetland assessments, flora and fauna surveys, avian assessments and post-construction bird and bat monitoring programs,

**North Beaver Bank Community Wind Project (NS), 2012 - Wetland Delineator/Environmental Specialist:** : Completed environmental assessments, wetland assessments, flora and fauna surveys, avian assessments and post-construction bird and bat monitoring programs,

**Nine Mile River Community Wind Project (NS), 2012 - Wetland Delineator/Environmental Specialist:** : Completed environmental assessments, wetland assessments, flora and fauna surveys, avian assessments and post-construction bird and bat monitoring programs,

**Pockwock Community Wind Project (NS), 2012 - Wetland Delineator/Environmental Specialist:** : Completed environmental assessments, wetland assessments, flora and fauna surveys, avian assessments and post-construction bird and bat monitoring programs,

**Millbrook Community Wind Project (NS), 2012 - Wetland Delineator/Environmental Specialist:** : Completed environmental assessments, wetland assessments, flora and fauna surveys, avian assessments and post-construction bird and bat monitoring programs,

**Truro Heights Community Wind Project (NS), 2012 - Wetland Delineator/Environmental Specialist:** : Completed environmental assessments, wetland assessments, flora and fauna surveys, avian assessments and post-construction bird and bat monitoring programs,

**Whynott's Community Wind Project (NS), 2012 - Wetland Delineator/Environmental Specialist:** : Completed environmental assessments, wetland assessments, flora and fauna surveys, avian assessments and post-construction bird and bat monitoring programs,

**Canso Causeway Avian Study (NS), 2016 - Avian Ecologist:** Completed avian studies and risk analysis, wetland assessments, flora and fauna surveys, as well as ambient sound assessments.

**Vegetation and Rare Habitat Assessment, Marshal Falls Development (NS), 2012 - Field**

**Biologist/Environmental Specialist:** Assisted in the completion of vascular/rare plant species surveys for a proposed hydro power canal near Sheet Harbor, Nova Scotia.

## PROFESSIONAL ASSOCIATIONS

- College of Applied Biology, British Columbia
- Alberta Society of Professional Biologists

## AREAS OF SPECIALIZATION

- Wetland/Watercourse Assessments and Permitting
- Vegetation Surveys
- Fish and Fish Habitat Assessments
- Environmental Assessment
- Wildlife Assessments
- Water Quality Assessments and Monitoring
- Geographic Information Systems (GIS)

## RELEVANT EXPERIENCE

Ms. Marriott is an Environmental Scientist with Strum working in our Environmental Science Group. Her experiences include environmental monitoring, wildlife and plant surveys, and extensive GIS activities. She has experience working on many aspects of projects, including proposal writing, permit applications, consultations, field work, data analyses, and report preparation.

Ms. Marriott is experienced in developing, utilizing, and maintaining ecological databases which are essential for conservation risk assessments, land planning, and management of wildlife, plant, and fishery resources. She has participated in consultations pertaining to the snow crab fishery in Labrador, and land use planning in Nunavut. She provided the GIS expertise required to complete the first Torngat Mountains caribou herd census (2014). She has also assisted with fieldwork for numerous research projects, including the assessment of biological control agents for plant pathogens, testing aversion conditioning and deterrent sprays on black bears, and assisted with the setup and monitoring of bearing fencing around igunaq caches on Igloolik Island.

Ms. Marriott has performed research in conservation biology using natural history collections to assess changes in relative abundance and geographic distribution of native and non-native lady beetles in eastern Canada. Her research contributed significantly to the prioritization of lady beetle species for future COSEWIC assessments. There are now two species listed by COSEWIC.

## REPRESENTATIVE PROJECTS AND ROLES

**Canso Spaceport Environmental Assessment (NS), 2018 – Environmental Scientist:** Contributed to the Project's environmental assessment and public consultation process.

**BigMoon Power Corporation Tidal Approval and Environmental Assessment (NS), 2018 – Environmental Scientist:** Contributed to the Project's environmental assessment and public consultation.

## EDUCATION

- MSc. (Biology), University of Prince Edward Island, Charlottetown, PE (2012)
- Adv. Dip., (GIS), Centre of Geographic Sciences, Lawrencetown, NS (2011)
- B.Sc., (Biology) University of Prince Edward Island, Charlottetown, PE (2006)

## TRAINING

- H<sub>2</sub>S Alive (2019)
- Wetland Specialist Training with an emphasis on Wetland Delineation (2018)
- Wilderness & Remote First Aid & CPR/AED Level C (2018)
- Erosion and Sediment Control (2014)
- Environmental Monitoring of Construction Sites (2014)
- Backpack Electrofishing (2015)
- Bear Safety Training (2013)
- Light Truck Precision Driving Program with Training in 4x4 Operation (2015)
- ATV Training Course (2015)

## PUBLICATIONS

- Assessing geographic and relative abundance patterns of native and non-native lady beetles (Coccinellinae) from historical occurrence data. MSc Thesis, University of PEI.
- Changes in the status and geographic ranges of Canadian lady beetles (Coccinellinae) and the selection of candidates for risk assessment. Part 1. Foundation Report (COSEWIC)
- Evaluation of biological control agents for the management of *Botrytis cinerea* in lowbush blueberry (*Vaccinium angustifolium*) under field and experimentally controlled conditions. BSc Thesis, University of PEI.

**Sustane Biomass Environmental Assessment (NS), 2018 – Environmental Scientist:** Contributed to the Project's environmental assessment and public consultation.

**Susies Lake Watercourse Monitoring (NS), 2018 – Environmental Scientist:** Involved in monthly monitoring (water sampling and vegetative surveys) in three watercourses which discharge into Susie's Lake.

**Highway 102 Lantz Interchange and Connector Environmental Screening (NS), 2018 – Environmental Scientist:** Completed wetland delineations and functional assessments of six wetlands (~10 ha), a rare plant survey, and a fish and fish habitat assessment.

**Lake Major Dam Replacement (NS), 2018 – Environmental Scientist:** Collected water and fish tissue samples for methylmercury testing, completed a fish and amphibian salvage during dewatering of the coffer dam. Assisted with on-going surface monitoring program.

**NSPI Hydro System Review (NS), 2018 – Environmental Scientist:** Assisted with a desktop review of wetland habitat associated with the 16 hydro systems in Nova Scotia.

**Musquodoboit Infill (NS), 2018 – Environmental Scientist:** Completed a wetland delineation, functional assessment and application for approval to alter a wetland in response to a complaint regarding the infilling of wetland habitat at 60 and 61 Mill Pond Court in Musquodoboit Harbour, NS.

**65/79 Shore Drive (NS), 2018 – Environmental Scientist:** Assisted with the CEAA Environmental Review for a new residential subdivision and marina at 65 & 79 Shore Drive, Bedford, NS.

**Oxford Trail Wetland Monitoring (NS), 2018 – Environmental Scientist:** Assisted with the installation of two wetland monitoring wells and eight vegetation plots as part of a monitoring plan to ensure wetland hydrology is maintained throughout construction of the trail.

**Piggott Lake Subdivision (NS), 2018 – Environmental Scientist:** Completed a wetland delineation and functional assessment for 17 wetlands (~2.2 ha) on 11 lots designated for development.

**Mahone Bay Nursing Home (NS), 2018 – Environmental Scientist:** Completed a wetland delineation and functional assessment of a wetland (~0.6 ha) at the site proposed for the new Nursing Home Facility in the Town of Mahone Bay, Nova Scotia.

**Prince Albert Road, Dartmouth (NS), 2018 – Environmental Scientist:** Completed a wetland delineation and functional assessment (~0.04 ha), and a fish and fish habitat assessment.

**NSPI Springhill Culvert Assessment (NS), 2018 – Environmental Scientist:** Conducted a fish and fish habitat assessment.

**City of Prince George Erosion Slope Protection Project (BC), 2015 – Biologist:** Environmental Monitor during bank stabilization project along a section of the Nechako River. Responsibilities included daily monitoring of water turbidity, inspections on equipment and machinery, erosion and sediment control measures, as well as associated daily and weekly reporting.

**Riparian Assessment, Prince George (BC), 2015 – Biologist:** Participated in a site visit to 2361 Estate Road, where a site assessment and riparian area evaluation was completed. Drafted letter to accompany the client's Riparian Development Permit application under the City of Prince George Zoning Bylaw #7850.

**Phase I Environmental Site Assessment – Site Visit, Prince George (BC), 2015 – Biologist:** Carried out a site visit to conduct visual and olfactory reconnaissance of 9883 Milwaukee Way and neighbouring properties. Also participated in phone interview with the property owner and conducted on-site interviews with persons present at the time of the site visit.

**Progress Energy Canada Ltd. Asset Management (BC), 2015 – Biologist:** Assisted with project initiation and development of a Vertisee mapping environment. Activities included data acquisition and management, ongoing updates and maintenance, as well as technical assistance to users of both Vertisee and the ArcGIS Collector

application. Also inventoried culverts and signage along approximately 580 km of access roads using a custom-made Collector App for ArcGIS.

**Village of Fraser Lake (BC), 2015 – Biologist:** Assumed responsibility for data acquisition and management of the Vertisee mapping environment. Also developed a custom-made Collector App in ArcGIS used in the field to inventory assets (e.g. storm, water and sanitary features, signage, etc.).

**CN Rail, Moose-Train Interaction Survey, Fraser-Fort George Area (BC), 2015 – Biologist:** Participated in ground surveys conducted from a CN Hi-Rail truck between McBride and Prince George.

**Mining Project (BC), 2014-2015 – Biologist:** Tasked with a variety of projects associated with the development of two large mining projects in BC. Duties include compiling Special Use Permit Application maps, Road Use Application maps, prioritized road upgrade map series, stream classifications maps, field maps, and winter road maintenance maps.

**McMillan Creek Water and Sediment Testing, City of Prince George (BC), 2014 – Biologist:** Collected water and sediment samples in response to a stream contamination event. In-situ water quality parameters were also monitored on both emergency and ongoing basis. Prepared an overview map of area, showing chemical exceedences in spatial relation to storm infrastructure.

**TransCanada, Coastal Gas Link Project (BC), 2014 – Biologist:** Reviewed bridge and road engineering designs for the Coastal Gas Link project to assess associated environmental impacts, as well as to determine permitting requirements.

**Parks Canada, Riverbank Stabilization at Rocky Mountain House National Historic Site (AB), 2014 – Biologist:** Prepared the turbidity monitoring program for the North Saskatchewan River bank stabilization works which involved the placement of ~4800 m<sup>3</sup> of rip rap in and around the Saskatchewan River at Rocky Mountain House Historic Site, AB. CEQG Turbidity Guidelines established by the CCME were followed.

**Dawson Creek / Chetwynd Area Transmission Line (DCAT) Project (BC), 2014 – Biologist:** Environmental Monitor; responsibilities included pre-clearing surveys for nesting birds, amphibians and noxious weeds, as well as daily inspections on equipment, machinery and erosion and sediment control measures, as well as associated daily and weekly reporting.

**Muncho Lake Provincial Park Road Works Project (BC), 2014 – Biologist:** Environmental Monitor during the installation of two out of three retaining walls on the Alaskan Highway adjacent to Muncho Lake. Responsibilities included daily water turbidity monitoring, inspections on equipment, machinery, and erosion and sediment control measures, as well as associated daily and weekly reporting.

**Census of the Torngat Mountains Caribou Herd (NL), 2014 – GIS Analyst:** In collaboration with the consulting caribou biologist, used telemetry data (GPS and VHF) and traditional Inuit knowledge collected between 1988 and 2013 to design the first census of the Torngat Mountains caribou herd, completed in March 2014.

**Aerial Survey and Fecal Collection of the Red Wine Mountains and Dominion Caribou Herds (LB), 2014 - Field Biologist:** Collared animals were located using telemetry data, photos of animals were taken for classification purposes and fecal samples were collected from individual cratering events in surrounding areas. Transects were also flown over known wintering grounds.

**Polar Bears from Space: Assessing Satellite Imagery as a Tool to Track Arctic Wildlife (NU), 2012 – Wildlife Research Technician:** Participated in groundtruthing satellite imagery of Rowley Island, NU using a helicopter survey and double observer analysis to verify detection of polar bears in satellite imagery.