

**ATTACHMENT A.**  
**RESUME OF ANN E. PEMBROKE**

## ANN E. PEMBROKE Program Manager

As Vice President and Technical Director of the Marine Services Group, Ms. Pembroke is responsible for the technical performance and projects in this Group. Her background is in marine ecology, specializing in impact assessment. She has managed the impact assessment, permitting, NEPA analysis, and monitoring for projects throughout the mid-Atlantic and New England. She has had significant involvement in every major type of coastal and offshore project, including pipelines, transmission cables, wind projects, deepwater ports, powerplants intakes, and wastewater outfalls. She has also worked on several projects directly for BOEM assisting them identify appropriate research questions on subjects such as electromagnetic field impacts, underwater noise, and habitat values of shoal features.

### REPRESENTATIVE PROJECT EXPERIENCE

**Seacoast Reliability Project, Eversource, Little Bay, NH (2014-Present).** ISO-NE has determined that rapidly increasing energy demands in the seacoast region will require additional transmission capacity. Eversource has proposed a new 115 kV line between Madbury and Newington, with a one-mile section installed through Little Bay. Ms. Pembroke is responsible for addressing environmental issues related with the burial of cables in Little Bay, part of the Great Bay Estuary National Estuary Research Reserve. She has designed and implemented field surveys for benthic resources, overseen water quality modeling, and worked directly with the installation contractor to define installation parameters. Ms. Pembroke will provide expert testimony at the NH Site Evaluation Committee hearings. Senior Marine Ecologist.

**Eelgrass Mitigation Feasibility, Massachusetts Port Authority, Salem Sound and Boston Harbor, MA (2012-2013).** Construction of a Runway Safety Area at Logan Airport resulted in impacts to an adjacent eelgrass bed, requiring mitigation. Ms. Pembroke designed and implemented a field assessment of the feasibility of mitigating for these impacts by replacing conventional moorings with conservation moorings in an eelgrass bed. Project Manager and Author.

**SeaLink Transmission System, New Hampshire Transmission, Ipswich and Massachusetts Bays, MA (2013-2014).** NHT proposed to install an HVDC cable from New Hampshire to Massachusetts to improve the reliability of service to the Boston metropolitan area with the majority of the route located in the Atlantic Ocean. Normandeau was responsible for characterizing benthic resources along the proposed cable corridor to assist in fine-tuning the route. Ms. Pembroke designed and implemented a multifaceted benthic survey consisting of sediment profile imaging, benthic grab sampling, and video survey. Results were used to help the project avoid sensitive resources. Project Manager.

### EDUCATION

M.S., Marine Biology, University of Delaware

B.S., Biology, Hobart and William Smith Colleges

### PROFESSIONAL EXPERIENCE

1980-Present	Normandeau Associates
1977-1980	College of Marine Studies, University of Delaware
1976-1977	Pandullo Quirk Associates
1974-1975	College of Marine Studies, University of Delaware
1972	Chesapeake Biological Laboratory

### PROFESSIONAL AFFILIATIONS

- New England Estuarine Research Society
- Estuarine Research Federation
- Gulf of Maine Council on the Marine Environmental, Habitat Monitoring Subcommittee

**Hawaii NextGrid, NEE Transmission LCC, Pacific Ocean, Hawaii (2013).** NEE Transmission evaluated the feasibility of developing an inter-island HVDC cable between Oahu and Maui, passing through the Hawaiian Islands Humpback Whale National Marine Sanctuary. Ms. Pembroke was asked to advise the project on issues related to electromagnetic fields. Several resources (whales, sea turtles, fishes) had the potential to be exposed to these emissions because the oceanic water depths made burial of the cable infeasible and unnecessary in terms of cable protection and the Maui landfall was proposed for a known sea turtle nesting beach. Ms. Pembroke assisted the project team in presenting information on EMF to local advocacy groups. Project Manager.

**Environmental Assessment for Commercial Wind Leasing and Site Assessment Activities on the Atlantic OCS Offshore Massachusetts, Bureau of Ocean Energy Management (2012-2014).** To facilitate upcoming lease sales for the Massachusetts WEA, BOEM underwent NEPA analysis of site assessment (geophysical surveys, installation of site wind data collection devices) activities. Normandeau prepared EA sections characterizing and addressing impacts to natural resources under NEPA. Normandeau also prepared documents supporting Section 7 consultation. Technical Reviewer.

**Block Island Wind Farm and Transmission System, Deepwater Wind LLC, Rhode Island Sound (2011-2013).** Deepwater Wind proposed installation of a 30 MW (five turbine) offshore wind farm and associated transmission cabling to service Block Island. The project also required a transmission cable between Block Island and the mainland. Ms. Pembroke provided permitting assistance to support the proposed Block Island Wind Farm in state waters. This effort required development of specialized study plans to characterize and assess impacts to benthic, shellfish, and fisheries resources that balanced the needs of both the regulatory agencies and the developer. Ms. Pembroke designed and implemented underwater video survey of hard substrate habitats and intertidal surveys. Project Manager and Benthic Ecologist.

**Effects of Underwater Noise on Fish and Invertebrates, Bureau of Ocean Energy Management, US OCS (2011-2013).** BOEM recognized that offshore activities for which they have oversight are contributing to the increasing levels of underwater noise on the OCS. Most research and regulatory activities have focused on marine mammals, but many fishes and invertebrates have the potential to be affected by anthropogenic noises as well. Ms. Pembroke managed the development of a workshop involving international experts to assist BOEM in filling gaps in their understanding of this emerging concern. Technical documents include a summary of research to date and identification of critical research needs on the effects of underwater noise. Project Manager and Author.

**Effects of Electromagnetic Fields on Marine Species, Minerals Management Service (now BOEM), US OCS (2009-2011).** In anticipation of siting renewable energy projects on the OCS, BOEM recognized that high capacity transmission cabling would be required. Because some species (e.g., sharks) are known to be able to sense electric fields, concerns were raised regarding the ability to conduct a thorough impact analysis for these cables. Normandeau was retained to conduct a comprehensive analysis of available literature on marine species, including invertebrates, fishes, reptiles, and mammals related to their ability to sense electric or magnetic fields and their responses to these fields. Normandeau coupled this analysis with predictive modeling of field strengths from

existing and proposed submarine cables. Ms. Pembroke directed the investigations and developed a series of recommendations for future research to fill critical data gaps. Project Manager.

**Calais LNG Terminal, Woodard and Curran and Calais LNG LLC, St. Croix River, ME (2008-2010).** Calais LNG LLC proposed to develop an LNG terminal along the St. Croix River along the Maine-Canadian border. FERC licensing required a comprehensive evaluation of natural resources that could be affected by the project. Normandeau was responsible for characterizing and evaluating impacts to all marine resources in the river (benthos, lobsters, fish, marine mammals, sea turtles, marine birds) and along the transit route that included the lower Bay of Fundy, a critical North Atlantic right whale feeding area. Limited information was available for the project area so Ms. Pembroke directed the development and implementation of field investigations for benthos, ichthyoplankton, and various life stages of lobsters. Project Manager.

**Bluewater Wind Delaware Offshore Wind Project, Bluewater Wind LLC and Tetra Tech EC, Atlantic Ocean, DE (2006-2008).** Bluewater Wind proposed an offshore wind project in response to the State of Delaware for development of new electrical generation capacity. After characterizing marine and coastal resources and potential impacts to them to assist in siting the project, Normandeau coordinated agency discussions to identify project-specific investigations. Project Manager and Author.

**Safe Harbor Energy Deepwater Port, Atlantic Sea Island Group LLC and Tetra Tech EC, New York Bight, NY (2006-2009).** Atlantic Sea Island Group proposed to develop an offshore LNG terminal by constructing an island in the New York Bight. Normandeau supported the project's application to the Coast Guard and MARAD under the Deepwater Port Act by characterizing marine resources and assessing impacts related to project construction and operation. Resources of concern included benthos, fish, marine mammals, and sea turtles and issues of concern included habitat loss or alteration and underwater noise. Ms. Pembroke developed and implemented survey plans to provide project-specific resource information and oversaw impact analysis for marine resources. Project Manager and Author.

**Northeast Gateway Deepwater Port, Excelerate Energy and Tetra Tech EC, Inc., Massachusetts Bay (2004-Present).** One of the first projects permitted under the Deepwater Port Act, Northeast Gateway is an offshore buoy system where specialized LNG vessels pump regasified product into a submarine pipeline. Normandeau prepared the Environmental Report documenting existing marine resources and project impacts to support the Deepwater Port Act application to the US Coast Guard and MARAD. Significant issues included fisheries resources and commercial fishing, endangered species, Stellwagen Bank National Marine Sanctuary, Massachusetts Bay Disposal Site, Essential Fish Habitat, and entrainment. Ms. Pembroke developed and implemented baseline and operational monitoring program for benthos, ichthyoplankton and water quality. She was instrumental in addressing marine mammal issues and the preparation of a Biological Evaluation for the Section 7 review process. Project Manager and Author.

**HubLine Natural Gas Pipeline, Duke Energy Gas Transmission (now Spectra) & TRC Assoc., Salem Sound, Massachusetts Bay and Boston Harbor, MA (1999-2008).** HubLine is a submarine extension of natural gas pipeline originating in the Canadian Maritimes, the first such installation

within Massachusetts state coastal waters. Thus, it was subject both to FERC documentation and licensing, but also the Massachusetts Environmental Protection Act. Under the direction of Ms. Pembroke, Normandeau prepared FERC Section 7C and State EIR sections on marine resources; assisted with federal, state, and local permitting; designed and implemented pre-construction surveys to characterize sediments, pre- and post-construction monitoring plans for marine biological resources and water quality monitoring plans for construction. Project Manager and Author.

**Long Island Offshore Wind Park EIS, Minerals Management Service (now BOEM) and Mangi Associates, New York Bight, NY (2006-2008).** Florida Power and Light proposed to construct wind park south of Long Island to provide Long Island Power Authority with additional capacity. BOEM was the lead agency for licensing and hired Normandeau as a third-party contractor to conduct NEPA analysis. Under Ms. Pembroke's guidance, Normandeau staff prepared impact assessment for biological resources potentially affected by construction and operation of the facility. Resources of concern include birds, bats, fish, benthos, marine mammals and turtles. Normandeau also developed a biological assessment of threatened and endangered species (piping plover, roseate tern, seabeach amaranth, several whales, and several sea turtles) in the project area in support of Section 7 consultation. Project Manager.

**Government Pier, Town of Hampton NH and Fay Spofford & Thorndyke, Hampton Harbor, NH (2004-2005).** Maritime safety organizations capable of dealing with emergencies in Hampton Harbor, located within sight of the Seabrook Nuclear Power Plant, were widely scattered. The town of Hampton received a grant to develop a central pier to support emergency vessels. Normandeau prepared the Environmental Assessment under NEPA and Clean Water Act permit applications for this project. Project Manager and Author.

**Cape Eelgrass, Epsilon Associates, Nantucket Sound, MA (2003).** Assessment of eelgrass habitat along existing and proposed routes for electric cables. Project Manager.

**Canney Brook Power, TTG Environmental Consultants, Piscataqua River, NH (2000-2001).** Siting assessment; evaluation of impacts to aquatic resources of the Piscataqua River associated with cooling system. Project Manager.

**GlobaLink Telecommunications Cable, Asset Channels/SAIC/Fay Spofford & Thorndike, Massachusetts, Cape Cod and Buzzards Bays, MA (2000).** Marine resources impact assessment for segments of project within Massachusetts state waters. Project Manager.

**Piscataqua Power Siting Study, Aries Engineering, Piscataqua River, NH (1998).** Environmental assessment, eelgrass, lobsters, entrainment and impingement issues for siting of a proposed gas-fired generating station. Project Manager.

**Sears Island Causeway and Mitigation Site Monitoring, ME Department of Transportation, Searsport, ME (1992-1995).** Monitoring of clam beds planted to mitigate for fill during expansion of causeway. Project Manager.

**Spaulding Turnpike Environmental Assessment, New Hampshire Department of Transportation, Piscataqua River, NH (1990-1992).** Characterization of benthic resources in areas proposed for expansion of highway. Principal Investigator.