Public Open House for the Development of Wind Energy Facilities at Naval Station Newport

Portsmouth Abbey Wind Turbine, ripower.org

Navy Energy Vision

The Navy and Marine Corps will lead the Department of Defense and the nation in bringing about improved energy security, energy independence, and a new energy economy.

This project will help Naval Station Newport to maximize the Navy's ability to meet renewable energy goals and help to ensure the long term sustainability of Naval Station Newport.

"Although they produce distinct types of challenges, climate change, energy security, and economic stability are inextricably linked." - 2010 Quadrennial Defense Review

Welcome

The goal of this open house is to inform the public of the proposed project, identify studies undertaken and present results from these studies.

This is your opportunity to provide comments that will be considered in the Environmental Assessment.

Purpose

- Naval Station Newport has identified the need to create a cost efficient and technically feasible wind energy project.
- Naval Station Newport must become more self-sufficient and maximize the Navy's ability to meet or exceed renewable power supply goals mandated in the Energy Policy Act of 2005 and Executive Order 13423.
- Naval Station Newport is one of the largest consumers of electricity in Rhode Island, spending an average of $12 million annually over the past 5 years.
- The proposed wind turbine project could produce up to 9 megawatts of power, representing 26% of current annual electrical consumption.
- All electricity generated by the project's turbines would be consumed by Naval Station Newport.

Current Renewable Energy Projects

- Renewable Projects
  - Solar Thermal Collectors
  - Solar Vent Preheat (Solar wall)
  - Photovoltaic Installation
  - Building-Level Wind Turbines
- Alternate Fuels
  - Using fuels that are renewable and sustainable
  - Naval Station Newport uses 22 electric and 3 hybrid cars
- Leadership in Energy and Environmental Design
  - Exterior insulating finishing system (Stucco) with high insulating value
  - Using insulated concrete form wall construction to increase R-values (measure of thermal resistance), low-emittance windows, bike racks, etc.

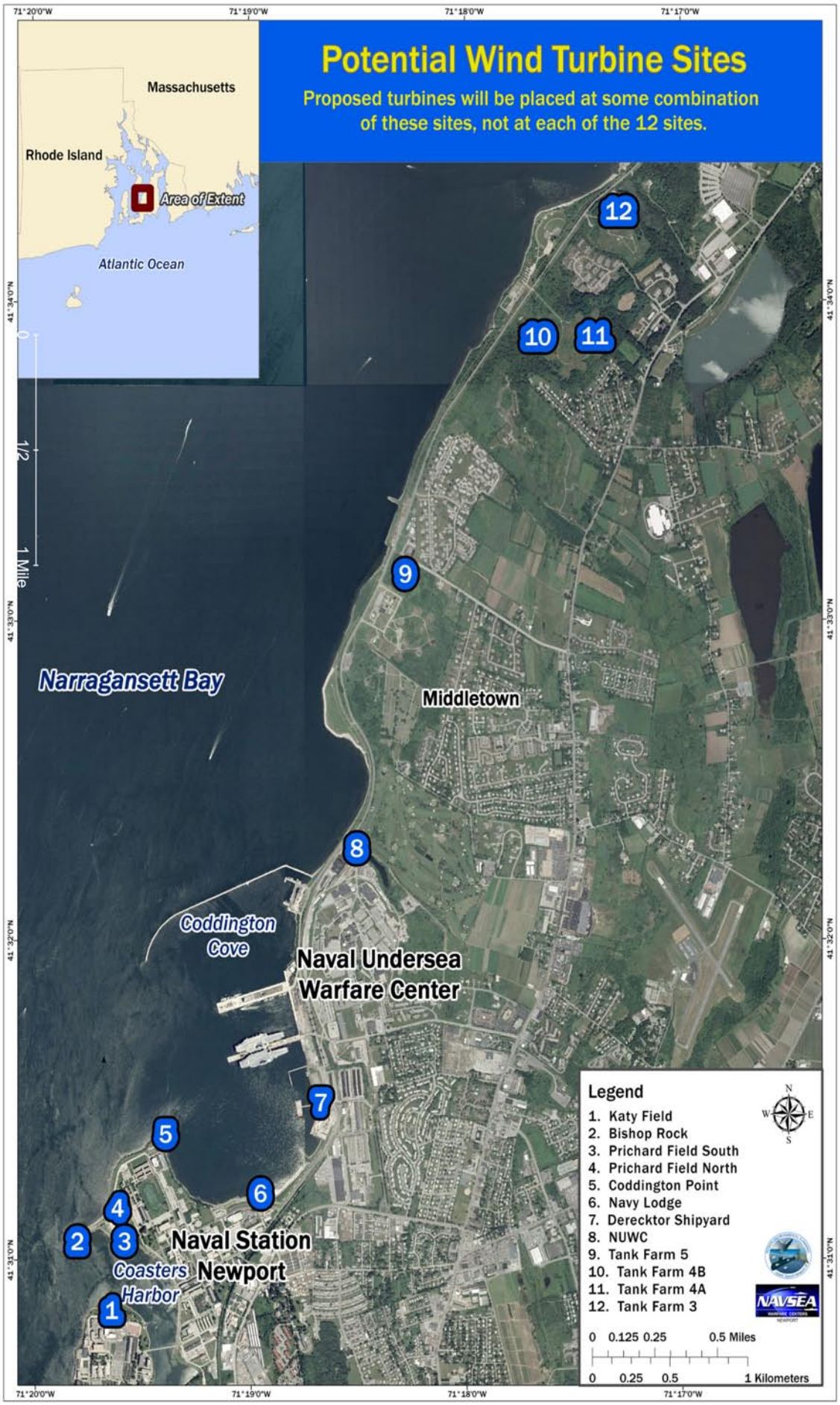
Energy Saving Initiatives

- Naval Station Newport has increased energy efficiency 46% since 2003
- Energy saving projects implemented include:
  - Optimization of steam production
  - Decentralized steam distribution
  - Replacing old steam lines
  - Upgrading lighting and pumps with energy efficient models
  - Electric metering
  - Domestic hot water

- Despite a robust program to reduce energy usage, Naval Station Newport remains among the most expensive Navy installations in the Mid-Atlantic Region

Proposal

- Construct wind turbines capable of producing up to 9 megawatts of power on Naval Station Newport
- Twelve potential sites are being analyzed; however, we anticipate fewer than twelve total turbines for this project
- The location, size, and number of turbines will be determined based on a combination which would result in a project best meeting the 9 megawatt goal
- The project includes the construction, operation, maintenance, and eventual decommissioning of wind turbines and associated support facilities


Potential Wind Turbine Sites
Proposed turbines will be placed at some combination of these sites, not at each of the 12 sites.
Massachusetts
Rhode Island
Area of Extent
Atlantic Ocean
Narragansett Bay
Middletown
Coddington Cove
Naval Undersea Warfare Center
Naval Station Newport
Coasters Harbor
0
1/2
1 Mile
71°20'0"W
71°19'0"W
71°18'0"W
71°17'0"W
41°34'0"N
41°33'0"N
41°32'0"N
41°31'0"N
Legend
1. Katy Field
2. Bishop Rock
3. Prichard Field South
4. Prichard Field North
5. Coddington Point
6. Navy Lodge
7. Derecktor Shipyard
8. NUWC
9. Tank Farm 5
10. Tank Farm 4B
11. Tank Farm 4A
12. Tank Farm 3
N
W
E
S
NAVSEA
0 0.125 0.25 0.5 Miles
0 0.25 0.5 1 Kilometers

Wind Resource Assessment

Background

Wind is air with kinetic energy that can be converted into usable energy by means of a wind turbine. Uneven heating of the earth's surface creates wind energy. Variation in heating and factors such as surface orientation or slope, absorptivity, and atmospheric transmissivity also affect the wind resource. In addition, the wind resource can be accelerated, decelerated, or made turbulent by factors such as terrain, bodies of water, buildings, and vegetative cover.

Wind Resource Assessment

A study was conducted by the National Renewable Energy Laboratory from 2009 – 2012. The study focused on the wind resource assessment, the estimated energy production of wind turbines, and a survey of potential wind turbine options based upon the site-specific wind resource.

Site	Hub Height Wind Speed	Mean Net Power Output	Mean Net Energy Output	Net Capacity Factor
Coddington Point (CP)	6.79 m/s	438.9 kW	3,877,637 kWh/yr	29.3%
Tank Farm 4	6.39 m/s	353.4 kW	3,095,995 kWh/yr	23.6%
Advantage of CP	6.3%	24.2%	24.2%	24.2%

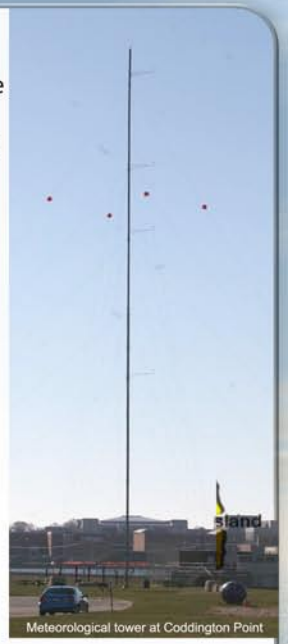
A comparision of two sites from the wind study

Methods

Meteorological towers were installed at Coddington Point and Tank Farm #4 and used in conjunction with a portable MiniSODAR. Characteristics analyzed were:

- Wind speed
- Vertical wind
- Shear factor
- Frequency
- Distribution
- Turbulence
- Intensity

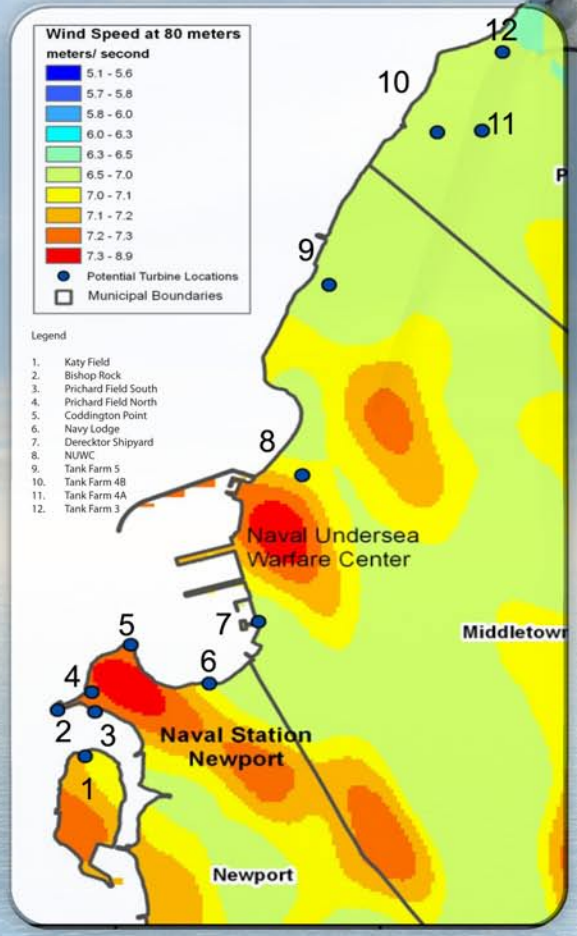
Wind speed data were collected at multiple heights.



Meteorological tower at Coddington Point

Findings

The study found that the wind resource at Naval Station Newport is sufficient for a wind project.



Environmental Assessment

- The Navy is analyzing impacts in accordance with the following laws and regulations:

  - National Environmental Policy Act
  - Coastal Zone Management Act
  - Endangered Species Act
  - National Historic Preservation Act
  - Clean Air Act
  - Clean Water Act
  - Fish and Wildlife Coordination Act
  - Migratory Bird Treaty Act
  - Sikes Act and Sikes Act Improvement Act

- The Navy is coordinating with the following federal and state agencies:

  - Federal Aviation Administration
  - United States Fish and Wildlife Service
  - Rhode Island Coastal Resources Management Council
  - Rhode Island Historical Preservation and Heritage Commission
  - National Park Service
  - Advisory Council on Historic Preservation
  - Federally recognized tribes

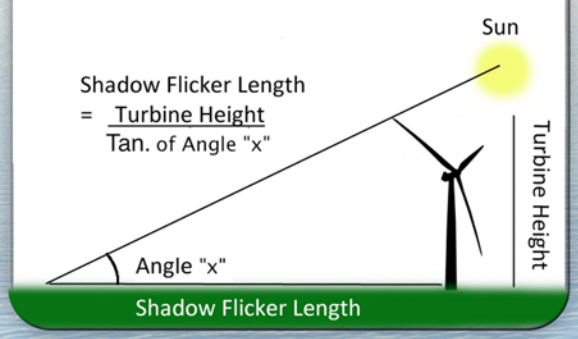
- The following studies have been completed:

  - Obstruction Evaluation/ Airport Airspace Analysis
  - Acoustic Baseline and Modeling Reports
  - Shadow Flicker Study
  - Bird and Bat Biological Surveys
  - Avian Radar Survey
  - Avian Risk Assessment
  - Marine Mammal Observation Study
  - Historical Assessment Viewshed Study
  - Archaeological Study

Shadow Flicker Study

Introduction

Shadow flicker is an intermittent change in the light in a given area resulting from the operation of a wind turbine. This is a result of the sun casting intermittent shadows from the rotating blades of a wind turbine onto a sensitive receptor such as a window in a building. The 'flicker' is due to alternating light intensity between the direct beam of sunlight and the shadow from the turbine blade.
The Shadow Flicker Study assumed the maximum size turbine and modeled representative turbines for these heights.



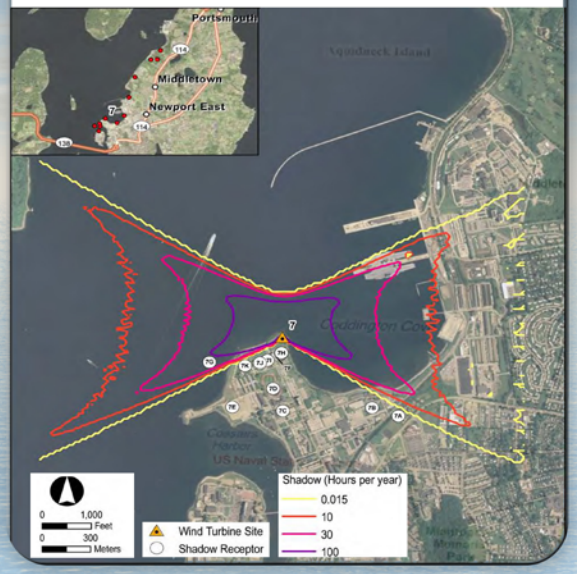
Methods

The shadow flicker impacts were modeled using the WindPRO 2.7 Basis software and associated shadow module version 2.7.473. Input variables and assumptions used for shadow flicker modeling calculations include:

- Locations
- Coordinates for nearby structures
- Topographic and digital elevation models
- Turbine heights and diameters
- Wind rose and average monthly sunshine
- No allowance was made for wind being below or above generation speeds
- No shadow impact when the sun's elevation is less than 3 degrees above the horizon
- No adjustment was made for obstacles such as terrain, vegetation, and/or buildings

Findings

Shadow flicker effects are expressed in terms of frequency (hours per year).
Of the 172 buildings located within 1,000 meters of a proposed wind turbine site, 101 (58.7%) would not be affected. The other 71 buildings may experience shadow flicker at certain times depending on the angle of the sun.



Acoustic Analysis

Introduction

Baseline Sound Monitoring: The objectives of this study were to characterize the existing ambient and equivalent broadband sound pressure levels near the potential wind turbine sites.

Acoustic Modeling: Potential sound levels were modeled at noise sensitive receivers in the project area.

FIGURE 2.
Common Outdoor Sound Levels

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Methods

Ambient sound levels were collected with three long-term and five short-term sound monitoring stations. The following sound levels were measured:

- Ambient sound level – the sound pressure level exceeded 90% of the time during a measurement interval; in terms of perception, it represents the quietest 10%.
- Equivalent sound level – the energy-average level over the duration of the measurement; it is referred to as the average sound level.

Acoustic modeling results were calculated with the Cadna/A acoustic model which uses a 3-D model for sound propagation and attenuation.

Findings

Existing sound levels in the project area are primarily determined by motor vehicle traffic, wind, waves, buoy bells and aircraft. Existing ambient sound levels were measured from 36.4 – 57.5 A-weighted decibels (dBA) and the average sound levels ranged from 37.8 dBA – 65.5 dBA.

Areas found to exceed noise criteria will be identified in the Environmental Assessment but these effects could be mitigated.

Sensitive Noise Receiver	Project Sound Level (dBA)
R1. Residence on Rolling Hill Road near Site 1	< 20
R2. Residence on Rolling Hill Road near Site 2	< 20
R3. Residence on Lawton Brook Road near Site 1	< 20
R4. Residence on Redwood Road near Site 3	< 20
R5. Residence on Harbor View Road near Site 2	< 20
R6. Residence on Greene Lane near Site 4	< 20
R7. Residence on Mayflower Drive near Site 4	< 20
R8. Residence on Brown Lane near Site 5	< 20
R9. Waumetonomy Golf Club, nearest tee to Site 5	< 20
R10. Residence on Semmes Street near Site 6	30.6
R11. Residence on Chases Lane near Site 6	29.7
R12. Residence on Maple Avenue near Site 7	33.3

Modeling results from Coddington Point

MAXIMUM PREDICTED SOUND LEVELS FROM SINGLE TURBINE OPERATION
Site #7 – Building 1112 (Vestas V112)
Maximum Predicted Sound Levels for One Turbine
Wind Energy Facilities at NAVSTA Newport

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Marine Mammal Study

Introduction

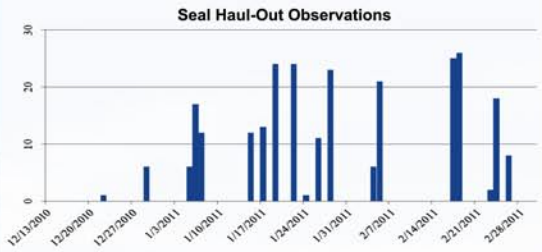
Harbor seals *(Phoca vitulina)* may be present in the project area from September – May. Noise and shadow flicker were analyzed as potential stressors to harbor seals hauled out near Coddington Point.
In order to verify seal presence and frequency of use at this haul-out site a survey was conducted from December 2010 – March 2011.

Methods

Observations were made with binoculars and animals were photographed. The observation point was located on the jogging path along the Naval Station Newport shoreline, approximately 220 feet from the haul-out site.

Findings

Seals were observed hauled out 24 days or 53% of the days sampled.



Site	Possible Days Impacted	Months Impacted
Coddington Point	10	May
Navy Lodge	19	Sept, Oct, March
Prichard Field North	135	Oct – Feb

Acoustic Modeling Findings

An acoustic analysis determined that seals would not incur hearing damage or behavioral disturbance.

Shadow Flicker Findings

Based on the analysis and proposed mitigation, the Navy determined there would be no reasonably foreseeable takes associated with the proposed project in accordance with the Marine Mammal Protection Act.

Minimum Flicker Per Day	Maximum Flicker Per Day	Flicker Per Year
4 minutes	43 minutes	5 hours 6 minutes
2 minutes	14 minutes	58 minutes
13 minutes	1 hour 39 minutes	55 hours 31 minutes

Avian Risk Assessment

Introduction

- Birds and bats are known to be affected by wind turbines
- Impacts often depend on a variety of factors including turbine placement and height
- Studies were conducted in support of an Avian Risk Assessment
- The Avian Risk Assessment outlines recommendations in order to minimize risks to birds and bats and comply with:
  - Endangered Species Act
  - Migratory Bird Treaty Act
  - Lacey Act
  - Bald and Golden Eagle Protection Act
  - Coastal Zone Management Act

Methods

- Bird and Bat Biological Surveys
  - Fall 2009
  - All seasons, 2010
  - All seasons, 2012
- Avian Radar Survey Report
  - Fall 2010
  - Spring 2011
- Bat Biological Survey Addendum
  - Spring 2011
  - Summer 2011

Mobile Avian Radar System used to determine number and altitude of avian species

Findings

The assessment found that the level of mortality for birds and bats at the proposed project area would fall within the ranges observed during post-construction surveys at other existing wind energy facilities in the eastern United States. This is not considered a high risk site to birds or bats, or to any federally threatened or endangered species.

During surveys of the Project Area:

- No Federally endangered species were present
- Two state endangered species were present
  - Peregrine Falcon *(Falco peregrinus)*
  - Northern Harrier *(Circus cyaneus)*
- Two sensitive species of bats were present
  - Northern Long-Eared Bat *(Myotis septentrionalis)*
  - Little Brown Bat *(Myotis lucifugus)*

Recommendations

- Post construction monitoring plan to assess effects
- Continue to work with the United States Fish and Wildlife Service to review results of post construction monitoring.
- Recognize concern from the United States Fish and Wildlife Service with regards to the risk of collision at the Bishop's Rock site.

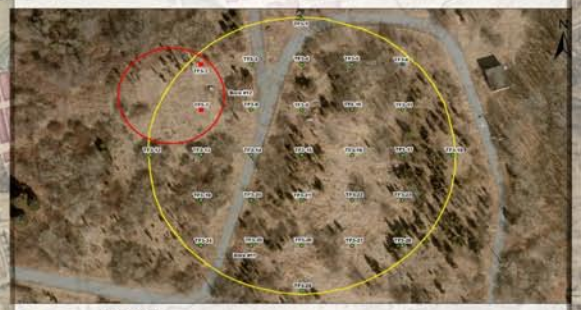
Archaeological Study

Introduction

- An archaeological investigation was completed for each of 12 sites under consideration for construction of a wind turbine
- Purpose of the study was to identify resources that may be eligible for listing in the National Register of Historic Places
- The study was conducted in accordance with the following
  - National Historic Preservation Act
  - National Environmental Policy Act
  - Rhode Island Historical Preservation and Heritage Commission Performance Standards and Guidelines for Archaeological Projects (2011)
- Participating parties included the Rhode Island Historical Preservation and Heritage Commission and the Narragansett Indian Tribe

Methods

- Area of potential effect was determined to be a 46 meter (150 foot) radius around the center point for a proposed turbine
- Shovel test pits were excavated at 15 meter intervals
- If an artifact was discovered, shovel test pits were excavated at 5 meter intervals
- Shovel test pits were not conducted at Katy Field and Bishops Rock sites due to ongoing remediation activities
- One geo-probe core (soil boring) was taken at each site to determine soil characteristics



Legend

- Test area limits
- Positive Modern/Historic STP Location
- Negative STP Location
- STP Location Not Excavated Due to Tank Location
- Geo-Probe Location
- Tank Location

Findings

- No further testing is recommended at the following sites
  - Derecktor Shipyard
  - Navy Lodge
  - Prichard Field North and South
  - Katy Field
  - NUWC
  - Coddington Point
  - Bishops Rock
  - Tank Farm 3

Recommendations

- Additional investigations may be required at Tank Farm sites 4A and 5 if chosen for construction
- Conduct archaeological surveys on additional areas that will be disturbed once the project design is available

Overview of Tank Farm 5 During Tank Construction (1942)

National Historic Preservation Act

Historic Properties and Section 106 Review Process

Overview

What is the Section 106 Process?
Section 106 of the National Historic Preservation Act of 1966 requires the Navy to consider the effects of an undertaking on historic properties.

What are historic properties?
Historic properties are cultural resources that are listed or eligible for listing in the National Register of Historic Places.

What are cultural resources?
- Historic Buildings
- Historic Structures
- Archaeological Sites
- Shipwrecks

Public Participation in the Section 106 Review Process

- You are invited to comment on information, concerns, or issues about historic properties in the project area or that may be affected by the proposed project
- Your input will assist the Navy in considering the potential effects of the proposed project on historic properties in accordance with Section 106 of the National Historic Preservation Act
- Please provide us with your comments on historic properties. To be most helpful, comments should be as specific as possible

Historical Resources Assessment

Introduction

- A historical architecture survey was conducted to inventory all above ground resources within the area of potential effect for the proposed project
- Purpose of the survey was to determine historical properties that may be visually affected by the construction of wind turbines on Navy property
- Participating parties included the Rhode Island Historical Preservation and Heritage Commission, the National Park Service and the Advisory Council on Historic Preservation
- Local historical organizations were also invited to review the report and provide input

Methods

- Area of potential effect was determined to be a 1.5 mile radius around a proposed turbine and expanded to include the southeast corner of lower Newport Harbor and the entire east coast of Conanicut Island (Jamestown)
- WindPro computer modeling software was used to calculate the potential for tower visibility based on proposed height and location of turbines and topographical information about the area of potential effect
- Photo simulations of the proposed turbines were prepared from various locations within the area of potential effect as recommended by the Rhode Island Historical Preservation Foundation

Findings

- Construction of turbines on Navy property will cause visual effects to the surrounding landscape
- Proposed southern turbines will have the greatest effects to historic properties
  - Katy Field
  - Prichard Field North and South
  - Bishops Rock
  - Coddington Point
  - Navy Lodge

Navy Way Ahead

- Navy will remove Katy Field site from consideration for a turbine
- Continue to work with consulting parties to minimize or resolve any identified adverse effects to historic properties