

SETUP FOCUS



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Town of Harwich

WIND FEASIBILITY STUDY



PUBLIC HEARING

Presented by:
Stephen Wiehe, P.G.

October 26, 2009

Weston&Sampson

Project Team

Weston & Sampson Engineers, Inc.

Power Engineers, LLC

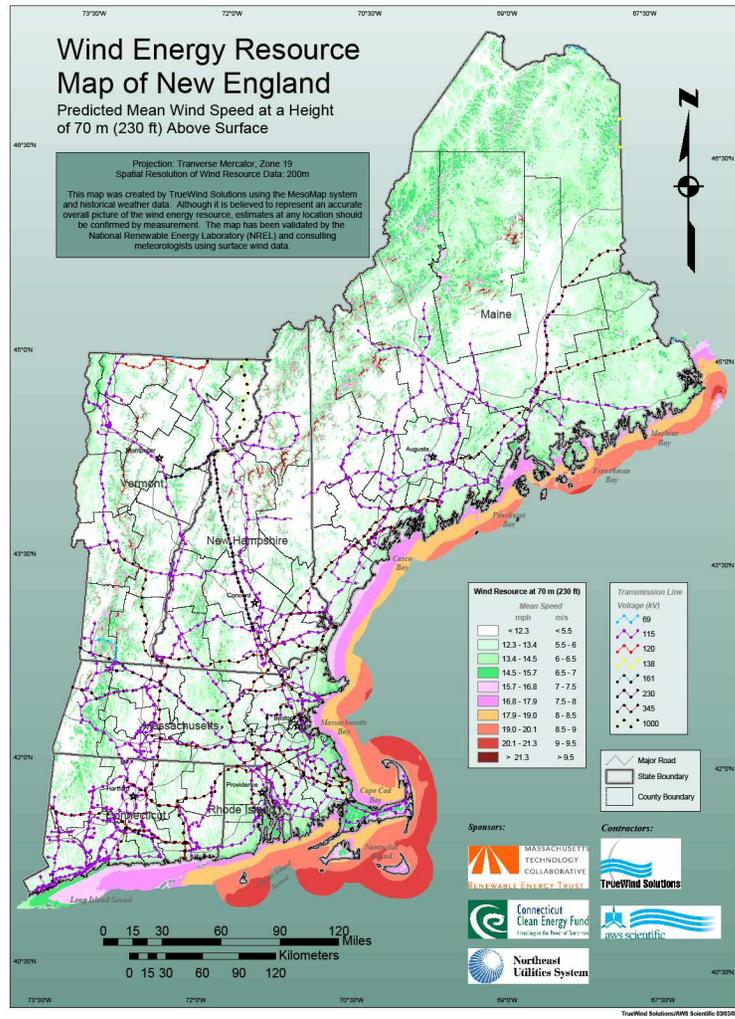
Funded in part by a grant from MRET



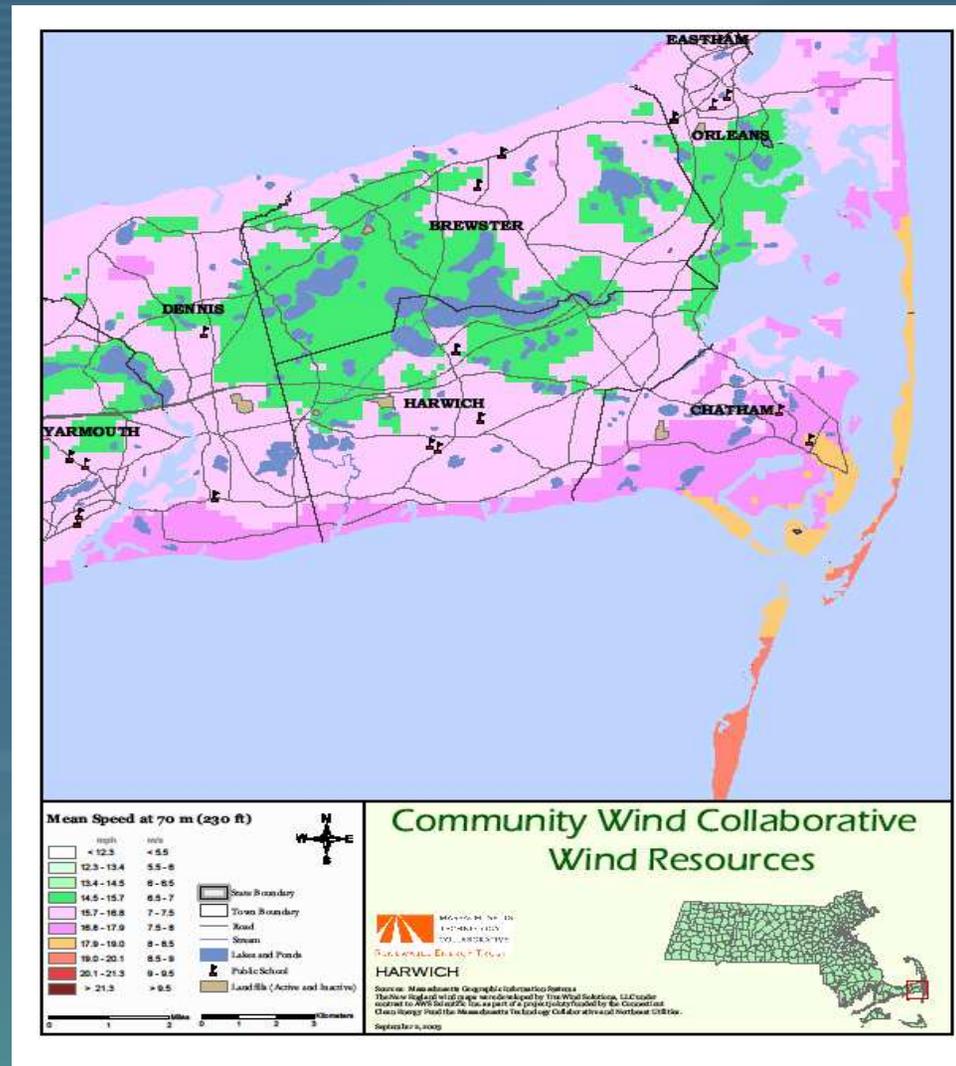
Feasibility Study \$40,000 (with 15% cost share)

Design & Construction Grants Currently Available up to \$570,000

Wind Resources



Wind Resources



Energy Rates

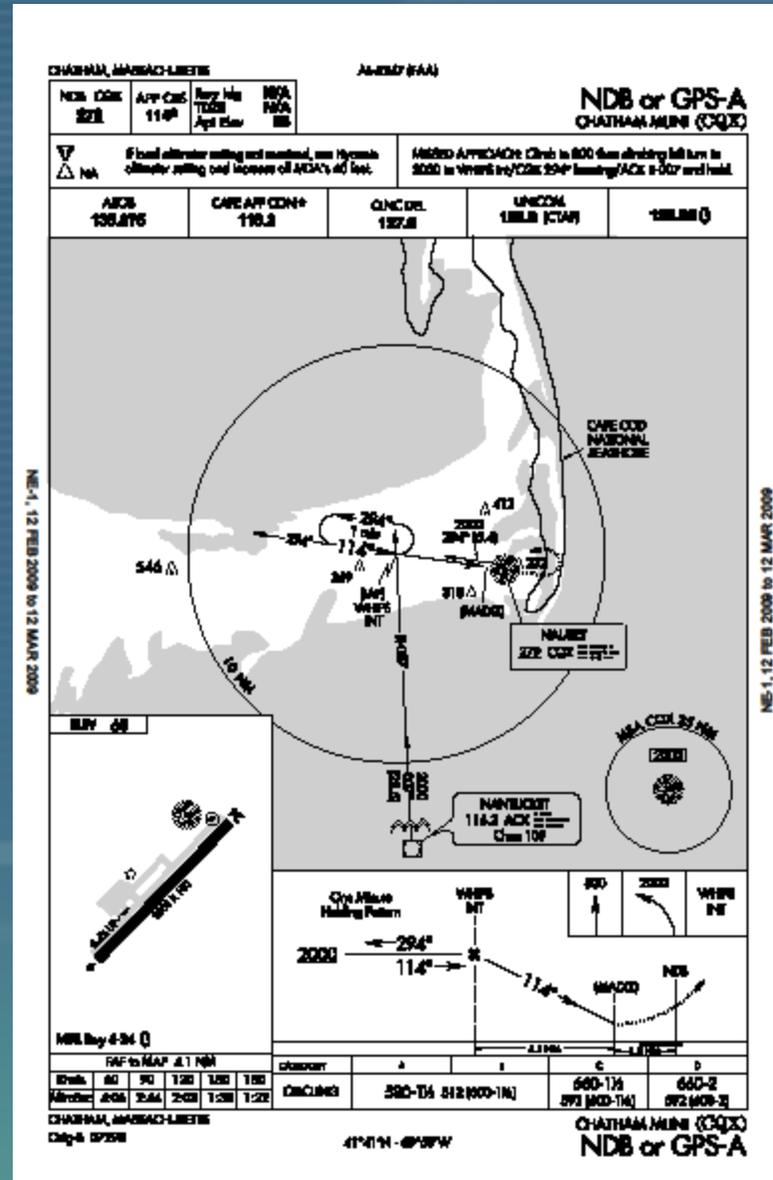
- Cape “Enjoys” High Energy Rates
- Average Rate of \$0.183 kWh
- Annual Town Use of 5,040,819 kWh
- Annual Town Expense of \$922,470

Review of Feasibility Study

- Five Primary Town Owned Sites Reviewed
- In The Flight Path of CQX
- Smaller Turbines - Not As Effective

Many Sites Considered Are in CQX Flight Path

FAA Circular



N. Westgate Road Site

- Outside of Flight Path
- FAA Determination of 500 feet AGL
- Property Location 0 N. Westgate Road
- 72-Acre Parcel + other Town Owned Land

FAA Determination Letter



Federal Aviation Administration
Air Traffic Airspace Branch, ASW-520
2601 Meacham Blvd.
Fort Worth, TX 76137-0520

Aeronautical Study No.
2008-WTE-4377-OE

Issued Date: 04/30/2009

James Merriam
Town of Harwich
732 Main Street
Harwich, MA 02645

**** DETERMINATION OF NO HAZARD TO AIR NAVIGATION ****

The Federal Aviation Administration has conducted an aeronautical study under the provisions of 49 U.S.C., Section 44718 and if applicable Title 14 of the Code of Federal Regulations, part 77, concerning:

Structure:	Wind Turbine North Harwich
Location:	Harwich, MA
Latitude:	41-42-37.14N NAD 83
Longitude:	70-06-32.65W
Heights:	500 feet above ground level (AGL) 557 feet above mean sea level (AMSL)

This aeronautical study revealed that the structure would have no substantial adverse effect on the safe and efficient utilization of the navigable airspace by aircraft or on the operation of air navigation facilities. Therefore, pursuant to the authority delegated to me, it is hereby determined that the structure would not be a hazard to air navigation provided the following condition(s) is(are) met:

As a condition to this Determination, the structure is marked and/or lighted in accordance with FAA Advisory circular 70/7460-1 K Change 2, Obstruction Marking and Lighting, white paint/synchronized red lights - Chapters 4,12&13(Turbines).

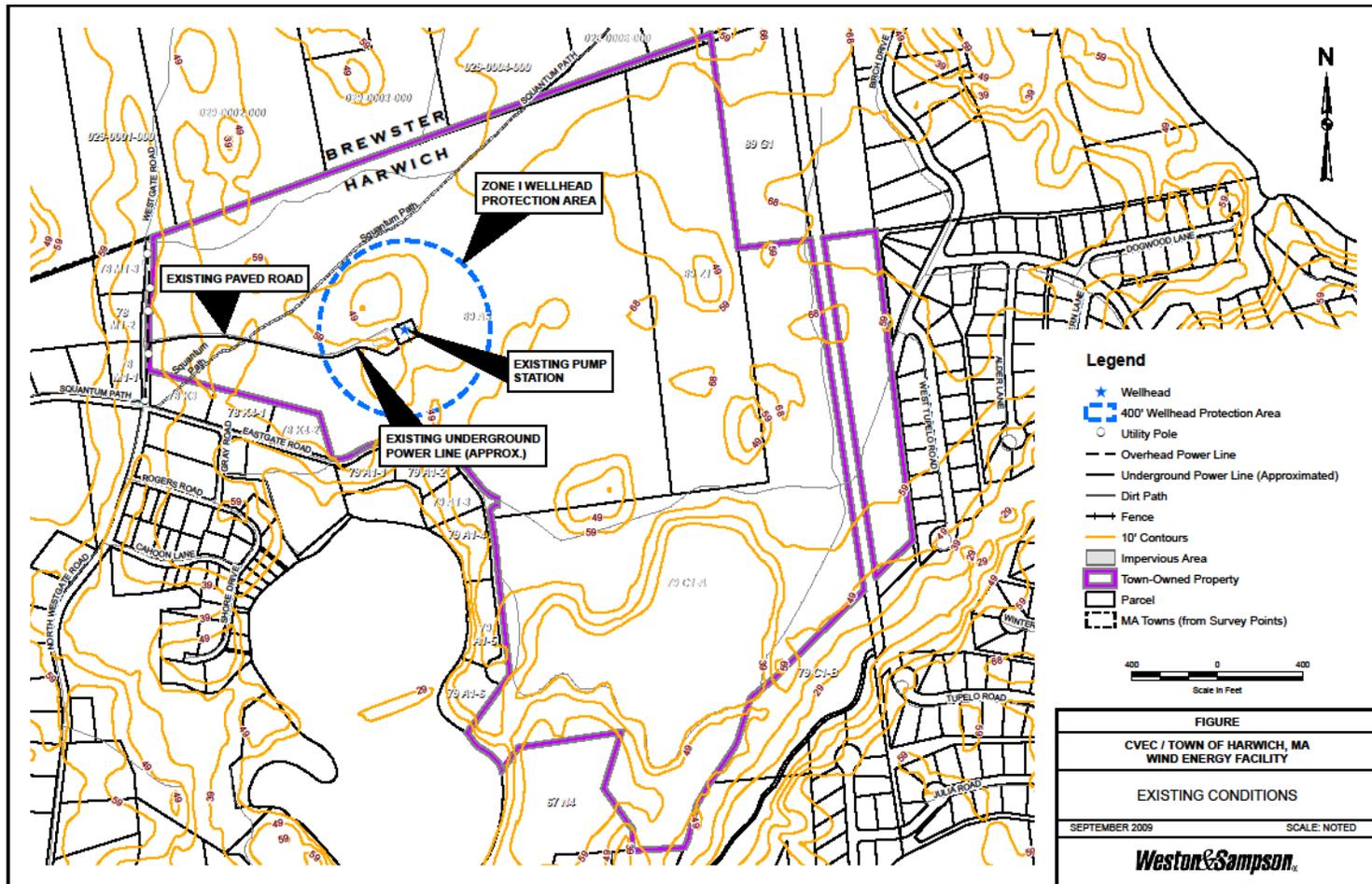
It is required that FAA Form 7460-2, Notice of Actual Construction or Alteration, be completed and returned to this office any time the project is abandoned or:

- At least 10 days prior to start of construction (7460-2, Part I)
 Within 5 days after the construction reaches its greatest height (7460-2, Part II)

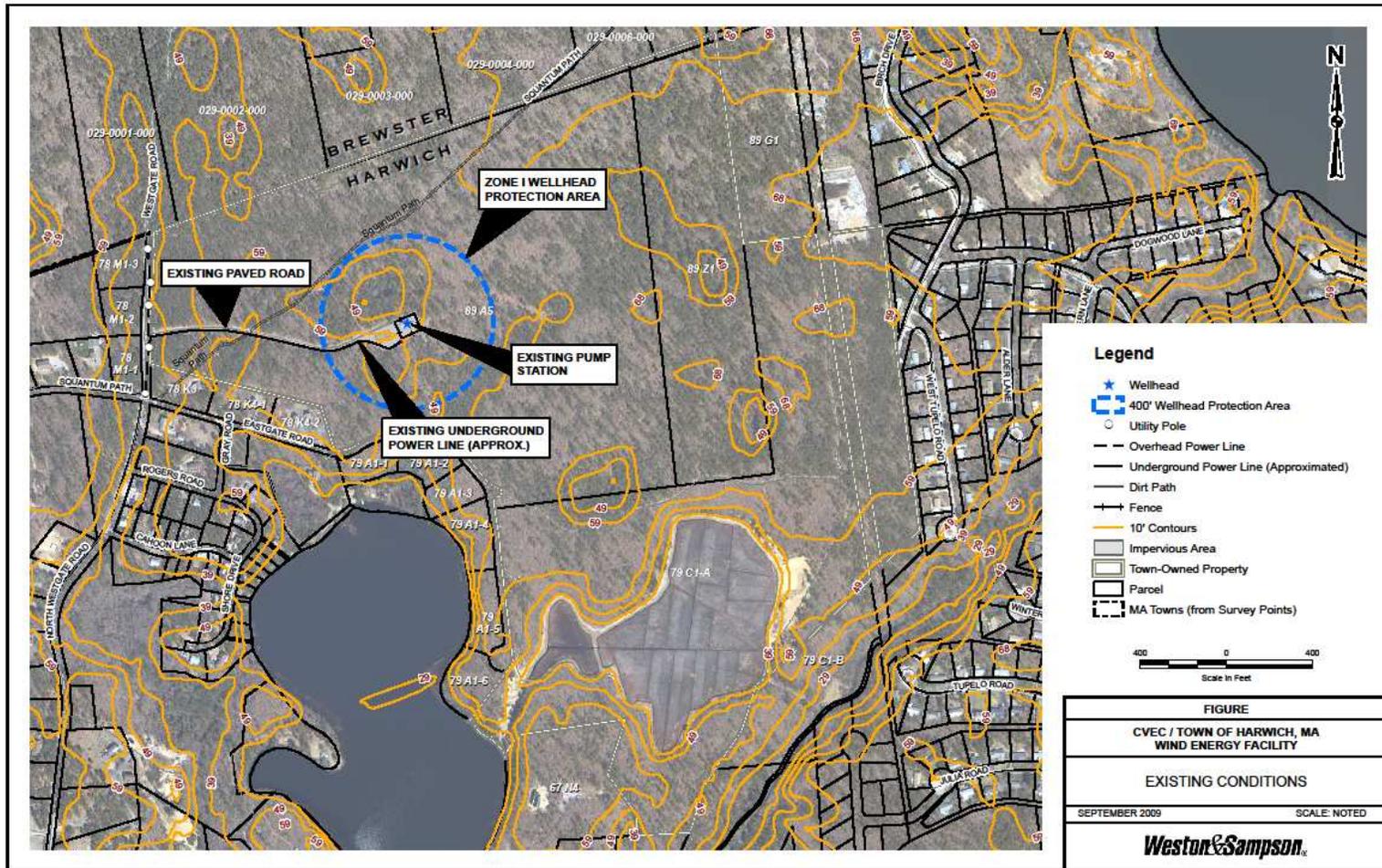
This determination expires on 04/30/2011 unless:

- extended, revised or terminated by the issuing office.
- the construction is subject to the licensing authority of the Federal Communications Commission (FCC) and an application for a construction permit has been filed, as required by the FCC, within 6 months of the date of this determination. In such case, the determination expires on the date prescribed by the FCC for completion of construction, or the date the FCC denies the application.

Existing Site Plan



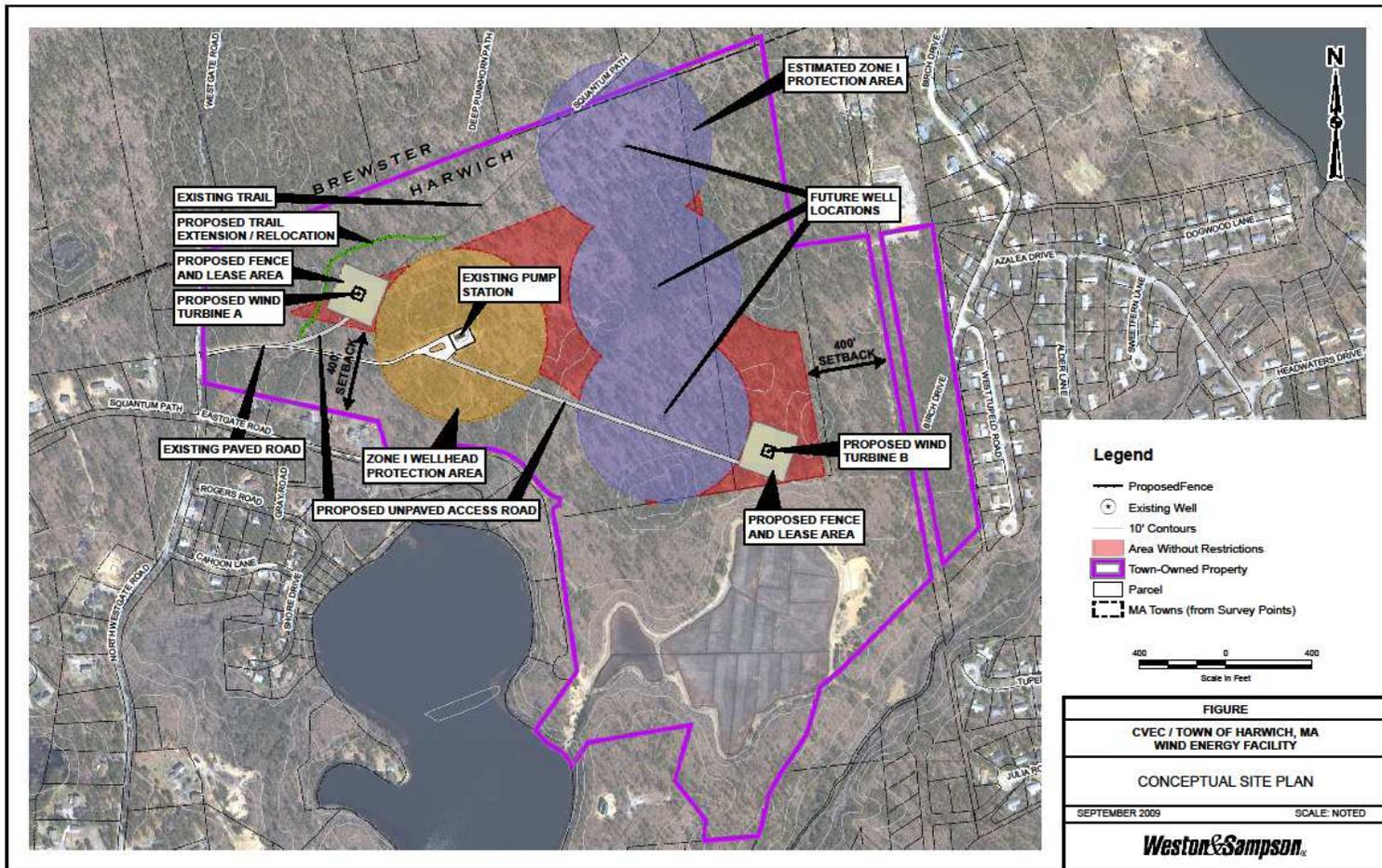
Existing Site Plan



Physical Site Constraints

- Special Permit Required
- Set Back From Property Lines (400 Feet)
- Well Field Protection Area (400 Feet)

Proposed Site Plan



Visual Analysis

Photo Location Information

#	Location / Description	Distance to Turbine (ft)	
		A	B
1.	Cranview Road	3025	4868
2.	Westgate Road	2554	3909
3.	North Westgate Road near Cahoon Lane	1591	2770
4.	Lynch Lane area (clearing in woods)	5959	7156
5.	Lynch Lane area (under power lines)	5829	7225
6.	Factory Road @ entrance to Mr. Calones' property	3815	5188
7.	Road cove Court	4895	3032
8.	Near intersection of Birch Drive and West Tupelo Road	2736	1181
9.	Boy Hill Road	2885	2384
10.	Entrance to Water Department property	893	2610
11.	Backside of pump house	606	1383

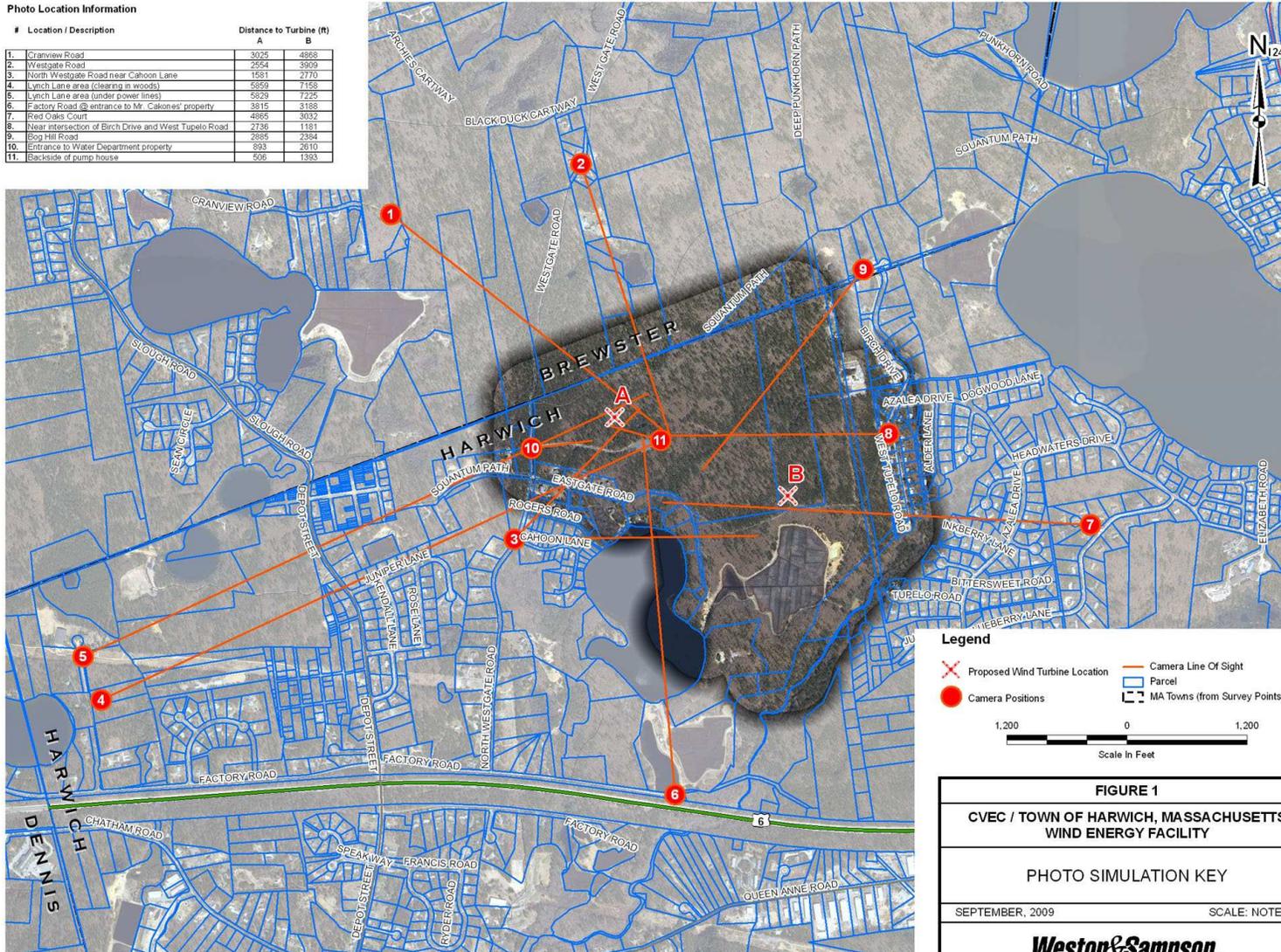


Photo Simulations

Location 1

Cranview Road

A = 3,025'

B = 4,868'



Photo Simulations

Location 2

Westgate Road

A = 2,554'

B = 3,909'



Photo Simulations

Location 3A

Westgate Road
& Cahoon Street

A = 1,581'



Photo Simulations

Location 3B

Westgate Road
& Cahoon Street

B = 2,770'



Photo Simulations

Location 4

Lynch Lane

A = 5,859'

B = 7,158'



Photo Simulations

Location 5

Power Lines

A = 5,829'

B = 7,225'



Photo Simulations

Location 6

Factory Road

A = 3,815'

B = 3,188'



Photo Simulations

Location 7

Red Oaks Court

A = 4,865'

B = 3,032'



Photo Simulations

Location 8

Birch Drive &
West Tupelo

A = 2,736'

B = 1,181'



Photo Simulations

Location 9

Bog Hill Road

A = 2,885'

B = 2,384'



Photo Simulations

Location 10

Pump Station
Entrance

A = 893'

B = 2,610'



Photo Simulations

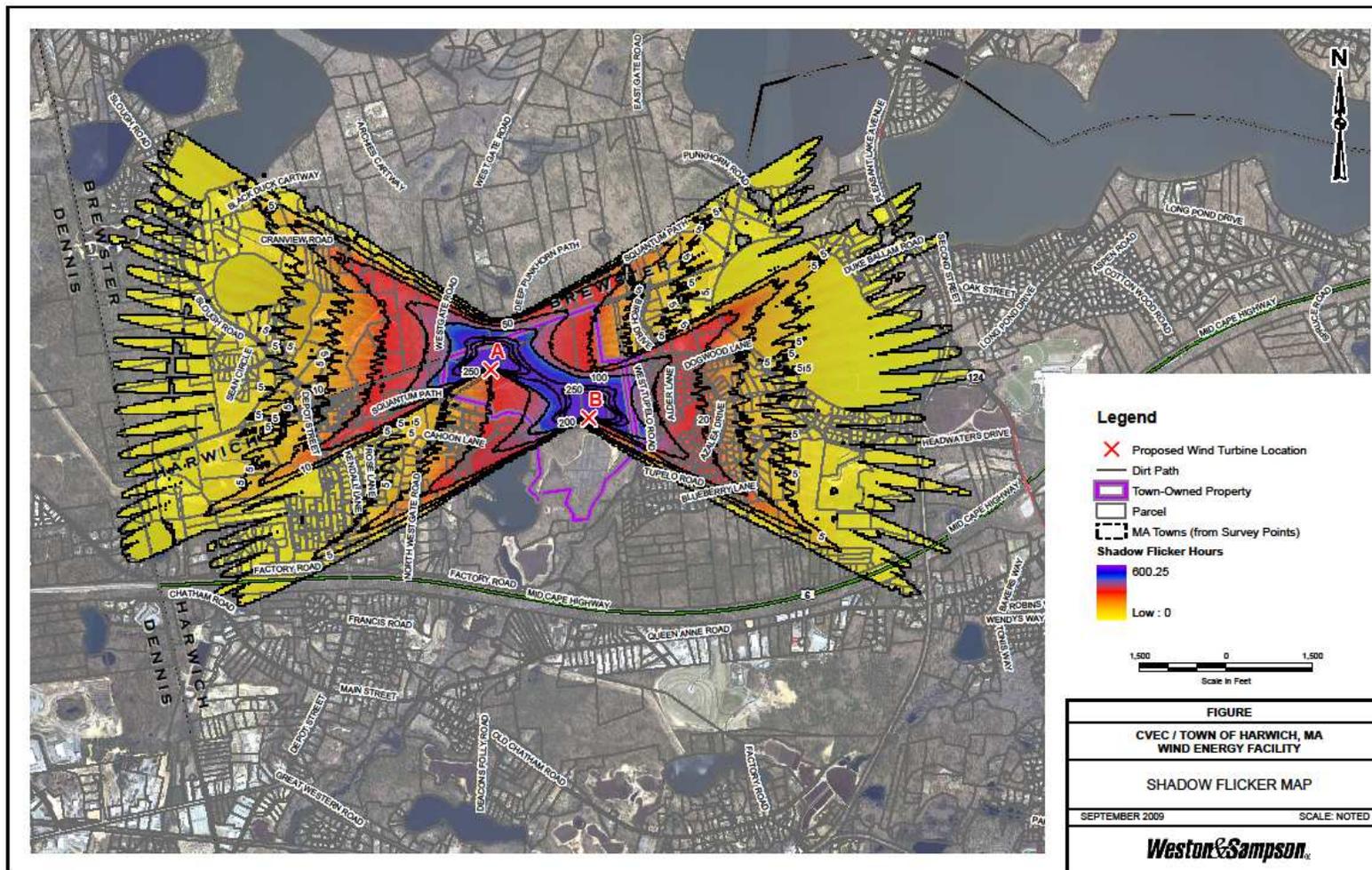
Location 11

Pump Station

A = 450'

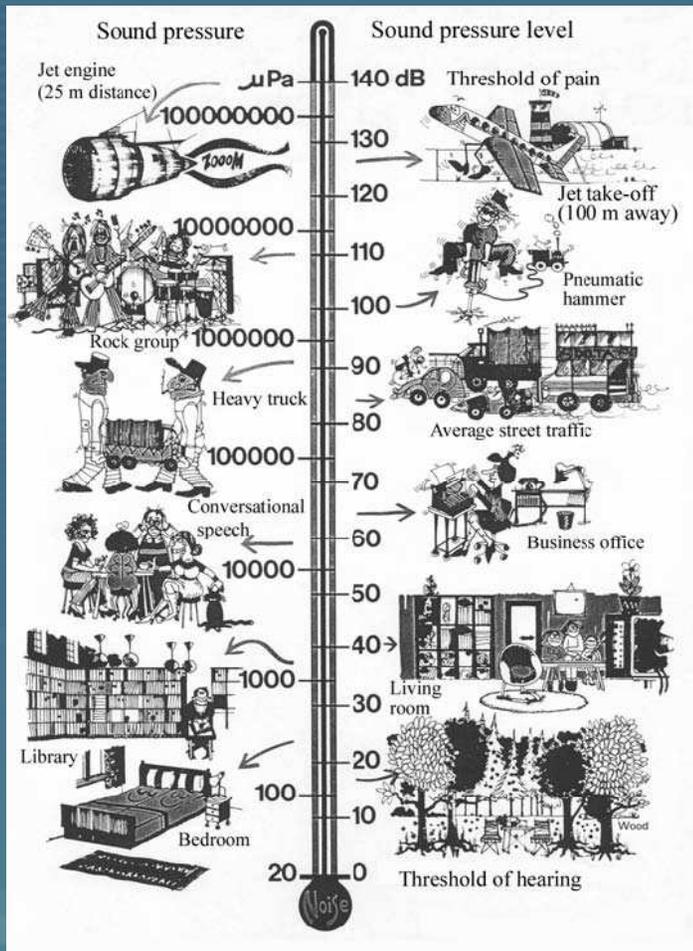


Shadow Flicker



Noise Assessment

DEP Guideline stipulates 10 dB(A) above ambient at the property line



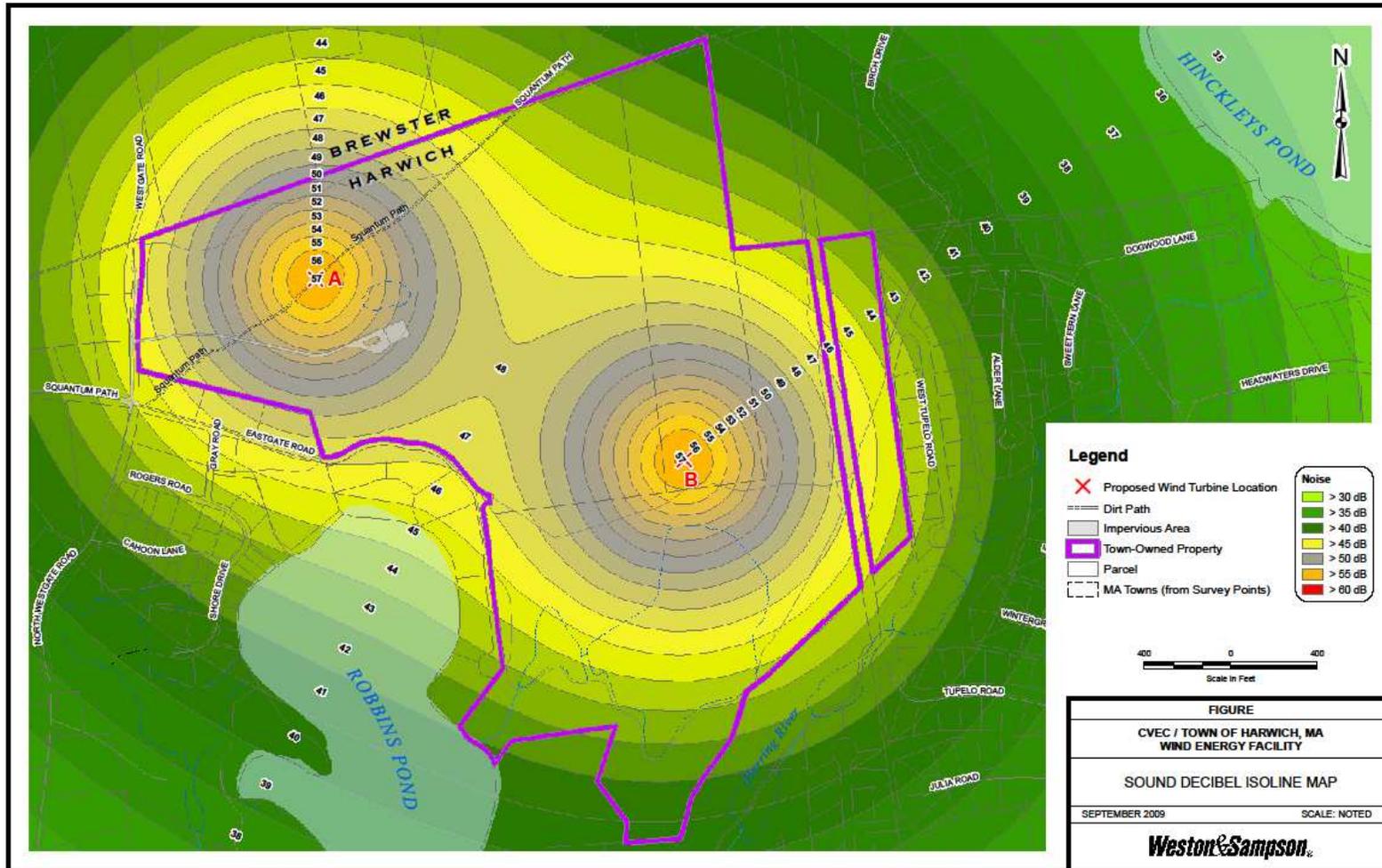
Lawn Mower is around 95 dB

Normal Conversation is 65 dB

Quiet Rural Evening is 30 dB

Human Ear: 0 dB is undetectable

Sound Decibel Map



Project Development

Time Frame: Historically 2 to 7 Years in MA

Project Costs:

600 kW = \$2M

1.5 MW = \$4-5M

Development Options

- Town Owned - Town Developed
- Third Party Ownership
 - Public vs. Private Ownership Models
 - Weston & Sampson recommended
 - CVEC Model Benefiting Public Interest
- Permitting, Entitlements, Procurement