

Memorandum

March 23, 2010

To: Paul Sieloff, Town Administrator
From: Geof Karlson, Wellfleet Energy Committee
Re: Status Report for Wellfleet Wind Turbine Project

Access Route to the Turbine Site

In general, there would be two possible access routes to the Turbine site. One would be from White Crest Beach parking lot (from the east to the west), and the other would utilize one of two possible Town-owned “woodlot” parcels to access the site from the west (west to east). The western access route would begin at Old County Road and proceed east either using the current “Duck Pond Road” (which would have to be improved), or use the small private road “Delphi Path” which would have to be widened and a new entrance from Old County Road between Harding Drive and Fred Bell Way. Both of the access options from the west would require crossing privately owned parcel(s) and property now in ownership of the Wellfleet Housing Authority. Those options would eventually cross the former railroad easement, the NSTAR easement, and then continue east.

The access route from the west became feasible when it was learned in early February of this year that the electrical connection to NSTAR from the turbine was possible at the NSTAR powerlines (i.e., at the NSTAR easement, to the west), rather than only at Ocean View Drive (to the east). The cost of connecting at the powerline easement is probably at least \$700,000 less than connecting at Ocean View Drive because of the cost of an NSTAR upgrade to the Ocean View Drive service that would be required.

Access from the west is also more desirable because it crosses habitat that is not as diverse as the access route from the east. From the west, the access route is mainly pine forest – the elevations range from about 50 to 70 feet and the grades are gradual enough to accommodate the requirements of the turbine transport without excessive “cut and fill”. From the east, the access path is more varied in terms of elevation, and would require more extensive cut and fill, and would cross relatively low-lying habitat in some places.

An additional benefit of access from the west is that the second of the two possible “woodlot” parcels runs close to a proposed future municipal well site that is situated about 800 feet to the south of the proposed turbine site. A turbine access road, then, could in the future be used for access to the well site for testing, possible construction, and for the route for water pipes and power if the well site should be developed in the future.

The length of an access road from the east (Ocean View Drive) is about 3000 feet, and the length of a road from the west, up to the NSTAR power line easement, is about the same.

Probable Increase in Area of Disturbance

For a MESA filing, there is a difference in requirements for projects that disturb more than five acres than for those that are under that limit. Under the original design (access and electrical connection to Ocean View Drive), the disturbed area was about 4.5 acres. With the new plan that will utilize an electrical connection to the west, either option for road access (from the east or from the west) will likely increase the total disturbed area to exceed 5 acres. This will create another level of potential delay in the environmental assessment and/or review by NHESP of the ultimate results of the assessment (expected to be completed in the Fall of 2010).

Weather-Related Risks

Modern wind turbines of the size proposed for Wellfleet have three major weather-related vulnerabilities in coastal Massachusetts. Two are related to potential damage, a third is related to energy production level.

The first weather related issue is damage from lightning. Even though turbines have robust protection mechanisms against lightning damage, the protection is not absolute. For example, a large GE wind turbine in Templeton, MA was recently damaged by lightning. The damage was confined to electronic components. However, lightning strikes can also damage rotor blades to the point that energy production is impaired and/or the blade must be removed. To replace a blade is costly because it requires bringing in a large crane to remove the rotor and blade assembly, etc. It is our understanding that the insurance quote for the facility provided by the Town's insurance agent does not cover weather-related damage.

The second weather related issue is potential damage or destruction from rare weather events, such as hurricanes. The Vestas V90, for example, is certified by the manufacturer for maximum wind speeds within the Category I hurricane range (up to a wind speed at ground level of 95 miles per hour). Neither the Vestas nor any other turbine, to our knowledge, is certified above this level. What is the potential of winds exceeding this level in Wellfleet? It is difficult to gauge that. Our engineering consultants, Weston & Sampson, reported that wind speeds of 87 mph were recorded recently on the north shore during a major winter storm. A hurricane of

greater intensity than Cat I would have the potential (but not certainty) of damaging or completely destroying the wind turbine.

Version 7 of the building code, implemented in 2008, requires certification for wind speeds above 95 mph – it is our understanding that the requirement now stands at 110 mph. The turbine manufacturers are currently not certifying their facilities at the higher rating. There is some movement to address this issue, probably by amending the code to reduce the wind requirement for wind turbines specifically. Currently, a variance issued by the State Board of Building Regulations and Standards would be required to construction the proposed turbine. Beyond the specific building code issue, the question remains of quantifying the risk that would be posed by hurricanes of Class II and higher.

The third weather risk relates to the long-term average wind speed at the proposed site. The financial estimates are based on conservative projections of average annual wind speeds, based on one year of actual wind sampling at the site. If the long-term average wind speed should be less than these estimates, then the financial return would be less. It is unknown what effect (if any) future climatic changes might have on these estimates. “Sensitivity” analysis of the financial projections indicates that a 20% decrease in average energy production (i.e., which is a very significant decrease), other things being equal, would reduce the average annual return from about \$334,000 down to about \$183,000.

Acoustic Effects

The requirements for the Special Permit require that the project meet the state standards for acoustic impact, which would effectively allow a maximum 10 dbA increase over the ambient sound level at the closest residence. The results of the acoustic study indicate that the proposed project would be far below this maximum, mainly because of the distance of the turbine from the closest residence of almost half a mile.

On March 16, 2010, CCNS Superintendant George Price sent a letter to the Energy Committee that included comments from NPS personnel and consultants concerning (i) the acoustic study performed for the project by Mr. Peter Guldborg and (ii) general issues relating to the impact of noise on wildlife. The comments relating to the acoustic study bear mainly on the extent of the actual sound sampling that was taken and the assumptions that may have been made based on the limited sampling that was done. Additional sound sampling could be taken to address the Seashore’s concerns. However, we do not believe that the results would change the conformance of the project to the current state limits.

There have been raised certain acoustic issues that are outside of the specific state acoustic limits. There are three such issues:

1. Potential health impacts that could affect certain at-risk individuals living near larger-scale wind farms. This was called “wind turbine syndrome” by the doctor who documented these effects. The Energy Committee does not believe these specific impacts are a risk of the proposal because the effects were documented only for wind farms with a minimum of eight, and up to forty-five, wind turbines.
2. Situations where the actual sound level is louder (more perceptible) than what is predicted by the acoustic modeling. This can happen in certain wind conditions. We know of no way to easily predict the extent to which this may occur. The major impact would be in summer. It is possible that the turbine could be “throttled-down” during certain periods in the summer (summer nights) to mitigate this, if it were an issue.
3. The impact of so-called “infrasound” – very low frequency sound that may be near or below the level of human hearing. There have been some studies that indicate that vibrations in this level, even if not audible, or of low audibility, may cause annoyance at a level greater than indicated simply by the “dBa” sound levels. This potential impact of this issue, if any, is also difficult to gauge for a single turbine – the documentation that we have been able to locate is related to multiple-turbine configurations.

In summary, the Energy Committee believes the project meets current state acoustic standards and would continue to be found in compliance even with additional sampling. Additionally, the Committee believes that the specific health impacts documented as “wind turbine syndrome” are not a risk because of the difference of scale of the project versus the scale of wind farms associated with “wind turbine syndrome”. Lastly, the Committee believes that it is not possible to determine the potential impact of possible other acoustic issues not specifically addressed by the state standards. It is not possible to guarantee that the turbine will not be audible at certain times in certain locations. However, the vast majority of any impact would be to an area to the east and especially north east of the turbine site, which is the “downwind” area for the vast majority of calendar days.

Net Metering “1% Limit” and Potential Impacts of Risk Factors on Project Schedule

In implementing the net-metering provisions of the Green Communities Act, the state Department of Public Utilities (DPU) declined to establish a procedure whereby bona fide

projects could be guaranteed the net-metering rates of reimbursement during the development process. Because of that, a project cannot be guaranteed the rate of return until the *actual start of production*. This is an issue because the total amount of capacity that is eligible for net metering is currently limited to “1% of historical peak demand”. For NSTAR, that is about 50 megawatts. Currently, there are about 10 megawatts already net-metered. This leaves a remaining total of 40 megawatts available for further net metering – which applies to both solar and wind projects in NSTAR’s service area. We have estimated that Wellfleet needs to be able to be up and running by the end of the 2011 or early 2012 at the latest in order to be safely within the 40 megawatt remaining limit versus other facilities that are in development and will be coming on line in the next two years. In order to meet that schedule, the project would need to be ready to begin construction in the winter of 2011.

Because of the MESA and other permitting issues related above, it appears now that the permitting process, including the Special Permit process and the NHESP review and/or negotiation of the environmental assessment and possible mitigation measures, may extend the permitting process into the winter of 2011, hence delaying the initiation of construction beyond the “window” of opportunity outside the nesting and migration season, which begins in April each year.

Additional delays might be incurred relating to the establishment of access from the west.

If the initiation of construction cannot reasonably be projected for winter of 2011, it would delay the estimated completion date of the project from the end of calendar 2011 to the end of calendar 2012. Such a delay could potentially increase the risk of failing to make the “1%” cap limit. Such a failure would subject the Town to selling its power at the “wholesale” versus “retail” rate, which would represent an on-going loss to the Town (although there is the possibility that this risk could be mitigated by entering into a long-term power purchase agreement with one or more distribution companies, an alternative method enabled by the Green Communities Act).