Summary Orleans CWC Recommendations for Amending Local Law No 1 2007 For Wind Facilities

The Orleans Citizens Wind Committee (CWC) was instructed to review the Orleans Local Law No 1 2007 for Wind Facilities in its present form to determine if this local law adequately protected the **health, safety and welfare of residents** in the Orleans "wind overlay district". After a period of eight months, the Orleans CWC produced two documents to the Town of Orleans; Part One and Part Two that produce in detail the following recommendations with substantiated facts and documents of reference. This is a summary of both Part One and Part Two of the CWC Recommendations with references submitted to the Town Board to adopt in Local Law No 1 2007 for Wind Facilities that would better protect all residents in the Orleans Local Law. It is advised that documents Part One and Part Two be read in their original format. Copies of both documents can be obtained by FOIL from the Town Clerks Office.

Documents listed in light blue pdf are on a cd disk given to the Town of Orleans and to each council member.

The Orleans CWC took seriously their charge to protect the future health, safety and welfare of all residents living in and adjacent to an industrial wind development in the Town of Orleans.

Part One A. Shadow Flicker/Safety Setback Recommendation:

The consensus of the Orleans Wind Committee is that the Turbines be set back at least 3000 ft or 10 Turbine Rotor Diameters (whichever is greater) from the property lines and from nearby affected roads/intersections to avoid significant Flicker Problems.

It is also recommended that the Town shall specify coating materials or effects in zoning.

The Town should also specify a setback distance from property lines and roadways to eliminate shadow flicker.

The Town should also require shutdown of the turbines during periods of peak flicker if that becomes a problem.

The Town should require the WECS developer to mitigate any unexpected shadow flicker effects promptly at its own expense.

References:

1. Wind Energy Handbook, by Burton, Sharpe, Jenkins, Bossanyi, Wiley & Sons Ltd, New York, 2001 pg. 527; pdf
2 LM Glasfiber Blade Composition one blade. http://www.highbeam.com/doc/1G1-119158764.
3 Town of Bethany, Wind Committee Report; pdf Ice Throw: Page 22-23
4 Taylor & Rand 1991 Guidelines for Wind Energy; http://www.ifc.org/ifcext/enviro.nsf/AttachmentsByTitle/gui_EHSGuidelines2007_WindEnergy/$FILE/Final+-+Wind+Energy.pdf
5 Vesta Maintenance Manual pdf
6 Town of Bethany, Wind Committee Report; pdf Page 20
7 Danish Turbine Failure: "Endelig redegørelse for haveriforløb ved Halling og Sidinge2" pdf
8 Image Shadow Casting from Wind Turbines is available at http://www.windpower.org/en/tour/env/shadow/index.htm
9 "Health, Hazard and Quality of Life Near Wind Power Installations: How Close is Too Close?" By Nina Pierpont, MD, PhD. An analysis of health risks near WECS facilities.(pdf)

10 Michigan State University "Michigan Wind Energy System Siting Guidelines" (pdf)
http://web1.msue.msu.edu/cdnr/otsegowindflicker.pdf
11 "Wind Farmer: The Wind Farm and Design and Optimization software"
http:www.garradhassan.com/windfarmer/flicker.htm
12 "WindFarm from ReSoft" (http://members.aol.com/resoft/shadflik.htm)
13 shadow calculator on the Danish wind power site (copyright protected)
www.windpower.dk/tour/env/shadow/shadowc.htm
14 Photosensitive Epilepsy - Other Possible Triggers by Professors G Harding (Aston University, England) and S Seri, 28 October 2005. Recommendations on lower limits for wind turbine shadow flicker.(pdf)
15 Public Health Impacts of Wind Turbines, Minnesota Dept of Health 2009 pdf

Referenced: Community Wind Law/Ordinances *used for ALL Categories*

1. Town of Union Rock County, Wisconsin Ordinance No 2008-06 (pdf)
http://betterplan.squarespace.com/town-of-union-wind-ordinance/
2. Trempeleau County Chapter 21 Law (pdf)
http://betterplan.squarespace.com/the-trempeleau-county-wind-ord/
3. Town of Allegany, New York Wind Energy Regulations Aug 2007 (pdf)
http://www.garyabraham.com/files/wind_laws/town_allegany_wind_energylaw_adopted_8-28-07.pdf
4. Town of Orleans, Local Law No 1 2007 for Wind Facilities (pdf)

Part One B. Noise/Sleep Interference Recommendation:

The Wind Committee's consensus is that the Town of Orleans adopt a new noise *ordinance in Local Law No 1 2007 for Wind Facilities that follows the spirit of the* Guidelines written pro-bono by two well known and respected Acoustical Engineers, George Kamperman and Richard James put forth in the "Simple Guidelines for Siting Wind Turbines to Prevent Health Risks". Kamperman-James Ver 2.1 Oct 28 2008

Kamperman and James recommendations have 3 major parts:

- Establishing pre-construction long term background noise levels that exist now.
- Establishing wind turbine sound immersion limits that the wind farm must meet.
- Post construction wind farm noise compliance testing.

Sound Limits:

Audible Noise Limit dBA: No wind turbine or group of turbines shall be located in Town of Orleans wind district that cause an exceedance of the pre-construction night-time background sound levels by more than 5 dBA.
Test sites are to be located at the property line(s) of the receiving non-participating property(s).
Not to exceed 35 dBA (LAeq) within 100 feet of any occupied structure**.**

Low Frequency Noise Limit dBC : Low Frequency Noise Limit LAeq – LA90 = 20 dB or less

References:

1 Orleans Noise Ordinance in Local Law No 1 2007 for Wind Facilities pdf
2 Clayton's Cavanaugh & Tocci Report & Summary.pdf Report on Clayton Farm Project, Clayton, NY, Report dates 2/15/08 "Comments on Noise Analysis PPM Clayton Wind Farm" Report date 8/25/08 "Executive Summary" pdf
3 Charles Ebbing Presentation to Orleans Board on Wind Farm Noise Final pdf
4 World Health Organization ("WHO") suggests using a dBC weighting pdf

http://www.who.int/docstore/peh/noise/guidelines2.html
5 "Measuring Background Noise with an Attended, Mobile Survey during Nights with Stable Atmospheric Conditions". C Schneider Inter Noise 2009 Report pdf
6 "Background Sound Measurements And Analysis In The Vicinity Of
Cape Vincent", New York May 11, 2009 by Schomer and Associates. Inc.
Paul Schomer Cape Vincent Measurement Report v5-2. pdf
Resume Paul Schomer. pdf
7 "Guideline L For Assessing The Impact Of Air-Conditioning Outdoor Sound Levels in the Residential Community" ARI Guideline L-1997. pdf
8 National Estimate of Outdoor Background Noise Based on General Type of Community Area and Nearby Automotive Traffic Activity, Rick James.
Typical Land-Use Situations and Associated Sound dBA pdf
9 "Noise Standards for Wind Turbines Background documents for New York" by RSG Inc Environment, Energy & Acoustics. pdf
10 Wind Industry Bulletin RSG INC. Noise Standards for Wind Turbines Background document for New York Feb 2009 pdf page 2 "Noise Primer for Wind Turbines"
11 Maple Ridge Clif Schneider study pdf
12 World Health Organization Sleep Disturbance. pdf http://www.who.int/docstore/peh/noise/guidelines2.html
14 International Standards Organization (ISO) recommendations;
1996-1971 report Table 9 pdf
15 New York State DEC's report Assessing and Mitigating Sound Impacts dec guidelines noise2000 . pdf
http://www.dec.ny.gov/regulations/2374.html
16 Kamperman & James October 28, 2008 Version 2.1 "The How To Guide to Criteria For Siting Wind Turbines to Prevent Health Risks From Sound"
08-11-02 Kamperman-James Ver 2 1 (Orleans) Noise Criteria for Siting Wind
Turbines 2.1 . pdf
http://www.myotherdrive.com/dyn/pv/547.570910.02122008.28928.6a64fi/How%20to%20Guide%20for%20Siting%20Wind%20Turbines%20Kamperman%20and%20James.pdf?sort=0
17 Town of Clayton Horse Creek Noise Analysis (includes portions of Orleans Township) CH2MHILL Report pdf http://www.iberdrolarenewables.us/horsecreek/AppendixI_Noise_05030/Noise_CH2MHILL_05030.pdf
18 Wind Turbine Sound at Night Acoustical Practice and Sound Research: pdf
http://www.myotherdrive.com/dyn/pv/500.431610.02122008.29196.6a64fi/g.p.%20van%20den%20berg%20effects%20of%20wind%20profile%20at%20night.pdf?sort=0
19 Fritz Van den Berg, G.P. 2003 Paper ID 160 "Wind Turbines at Night: Acoustical Practice and Sound Research" Effects of wind farm at night pdf
http://www.myotherdrive.com/dyn/pv/500.431610.02122008.29196.6a64fi/g.p.%20van%20den%20berg%20effects%20of%20wind%20profile%20at%20night.pdf?sort=0
20 Environmental Protection Agency Identifies Noise Levels Affecting Health and Welfare; Noise Control Act of 1972 and the Quiet Communities Act of 978: pdf
http://www.nonoise.org/library/envnoise/index.htm
21 Environmental impacts of wind-energy projects pdf http://www.nap.edu/catalog/11935.html planning for and regulating wind-energy development 209
22 Dr. Alves-Pereira and Dr. Nuno Branco; "Wind Turbine Noise is Conducive to Vibroacoustic Disease" September 20, 2007 pdf http://www.garyabraham.com/files/wind/Public_health_and_noise_exposure.pdf
23 Dr. Amanda Harry, "Wind Turbines, Noise and Health" February 2007 pdf
http://www.windturbinenoisehealthhumanrights.com/wtnoise_health_2007_a_barry.pdf
24 Geoff Leventhall, pdf "Published Research on Low Frequency Noise and Its Effects" Department for Environment UK 2003 pdf
25 Rick Bolton Acoustics; Bolton Report: pdf Review of PPM energy noise assessment
http://www.garyabraham.com/ECCOdocs.html
26 UK Noise Association, pdf "Location, Location, Lociation: An Invesitgation Into Wind Farms and Noise (2006) (1,281KB) http://www.garyabraham.com/ECCOdocs.html
27 Industrial Wind Power Plants Public Participation and the Legal Requirements that Apply
http://www.garyabraham.com/files/Industrial_Wind_Power_Plants_OUTLINE_8-13-07.pdf
28 "Noise Radiation from Wind Turbines Installed Near Homes: Effects on Health."
with an annotated review of the research and related issues
by Barbara J Frey, BA, MA and Peter J Hadden, BSc, FRICS pdf
http://www.windturbinenoisehealthhumanrights.com/wtnhhr_june2007.pdf
29 Communicating the Noise Effects of Wind Farms Christopher Bajdek pdf
http://www.myotherdrive.com/dyn/pv/313.090310.02122008.28663.6a64fi/Bajdek_NC07.pdf?sort=0
30 AEI Special Report: Wind Energy Noise Impacts pdf http://www.acousticecology.org/srwind.html

31 Presentations to Wind Committee
Charles Ebbing, Acoustic Engineer Resume pdf
Richard R. James, E-Coustic Solutions Resume pdf
Dr. Paul Carr, Engineer Resume pdf

Part Two C. Electronic & Electromagnetic Interference Recommendation:

Town of Orleans shall require the WECS operator and at least one independent engineering firm to conduct pre and post construction signal evaluations for television, cell phone and wireless network interference. The WECS operator shall provide, in their wind development site proposal map locations of all communication towers and TV reception corridors in addition to the turbine site placements. The Town shall require the WECS operator to restore signals to pre-construction levels at its own expense or resolve at the direction of the complaint board.

References:

1. "A Simplified Guide to the NTSC Video Signal", pdf and http://www.seanet.com/~bradford/ntscvideo.html
2. Thousand Islands Sun on Wednesday April 29, 2009 "Channel 7, Fox 28 Expecting Interruptions"
3. Trempealeau County WI Wind Ordinance 11/28/07, Page 9 (231) #20; pdf).
4. Boston Scientific "Electromagnetic Interference (EMI) and Implantable Device Systems pdf; http://www.bostonscientific.com/templatedata/imports/HTML/CRM/A_Closer_Look/pdfs/ACL_EMI_and_Implantable_Devices_080408.pdf

Part Two D. Stray Voltage AKA Ground Current Recommendation:

Orleans shall require any CWECS project to meet the latest version National Electric Code for the life of the project.

Complaint Board: Complaint resolution including mitigation and any fines assessed to the developer to be handled at the discretion of the Complaint Board and the Town Board.

References:

1. America Wind Energy Association (AWEA) pdf page 21"Guide for State and Local Governments" http://maec.msu.edu/Guide%20for%20MPSC%20Rule%20web.pdf.
2. AWEA, American Wind Energy Association states on page 2 from their document "Residential Wind Systems and "Stray Voltage" pdf
3. "Final Report Lincoln WI Moratorium Committee" Pages 8 to 10 pdf.
4. "Reduce the Risks of Stray Voltage" by Richard Peterson, Cornell pdf and http://www.ansci.cornell.edu/pdfs/pd2008aprilp39.pdf

Part Two E. Construction Disruption Recommendation:

The developer shall be required to submit regular scheduling reports to the Town, indicating work completed to date, in progress and scheduled; this report shall include locations, construction routes and impacted property lots. The developer and/or an independent oversight agency should be required to actively monitor and address dust levels via standard construction techniques. Any impact reports submitted with application should address proposed routes, overhead obstructions and any necessary electrical or communications lines changes that would be made. The Town shall specify a limit on hours of heavy operation to a reasonable time frame. The Town shall consider the safe placement of new access roads.

Complaint Board: Complaint resolution including mitigation and any fines assessed to the developer to be handled at the discretion of the Complaint Board and the Town Board.

References:

1. http://www.iberdrolarenewables.us/horsecreek/ Appendix A - Project Construction 05030. Horse Creek DEIS
2. Wolfe Island dust http://www.youtube.com/watch?v=P-via0ec-AY
3. Town of Bethany, Wind Committee Report; pdf, pages; 12-13

Part Two F. Earthquake Seismic Effects Recommendation:

Orleans shall require that the Town of Orleans select and the WECS developer fund an independent Engineering Study and produce a complete report on the likely effect of seismic activity consistent with historical data on all the Wind Farm Facilities.

Due to the fact that Orleans environment lies on the St. Lawrence seismic fault the developer must submit an earthquake preparedness manual to the Town for protecting the residents in the event of an earthquake of sufficient magnitude to affect the operation of any part of the wind farm.

It is recommended that the Developer educate and share with the Town of Orleans volunteer fire department and the department of public works their safety mechanisms

and protocol for continued quality assurance on safety standards when seismic events occur.

References:

1. "The presence, characteristics and earthquake implications of the St. Lawrence fault zone within and near Lake Ontario (Canada–USA)", pdf, and
http://www.ScienceDirect.com Volume 353, Issues 1-4, 23 August 2002, Pages 45-74
2. Lamont Cooperative Seismic Network and the National Seismic System: Earthquake Hazard Studies in the Northeastern United States., pdf
http://www.ldeo.columbia.edu/LCSN/Report/LCSN_Tech_Report-98-01.pdf
3. " Risks of Damage from Earthquakes" , pdf
http://www.geo.mtu.edu/UPSeis/area.htm

Part Two G. Fire Risks & Fire Department Needs Recommendation:

The Town of Orleans requires any WECS developer provide necessary fire-fighting equipment and fire department training at its own expense. The WECS developer must also submit a fire protection and emergency response plan acceptable to the Orleans Town Board, created in consultation with the Orleans Fire Department having jurisdiction over the proposed district.

Orleans requires that each turbine be clearly labeled with a postal address compatible with the 911 emergency system to facilitate locating the fire.

Complaint Board: Complaint resolution including mitigation and any fines assessed to the developer to be handled at the discretion of the Complaint Board and the Town Board.

References:
1. Summary of Wind Turbine Accident data to 31 March 2009, pdf and http://www.caithnesswindfarms.co.uk/accidents.pdf
2. Emergency Management Guidelines for Wind Farms, pdf and http://www.cfa.vic.gov.au/documents/CFA_Guidelines_For_Wind_Farms.pdf
3. Town of Bethany, Wind Committee Report; pdf. page 16

Part Two H. Ground Water Impacts & Protection of Aquifers Recommendation:

To ensure the protection of surface and ground water resources surrounding wind project area(s) in the Town of Orleans:

Limit Blasting. It is recommended to apply constraints that the foundations have to be dug without the use of blasting. Workers are to use pneumatic hammers, rather than blasting.

Ground water investigation, survey, fate and impact analysis of identified contaminants relative to identified wells, and wetland impact analysis.

A comprehensive preconstruction survey of Krast features be conducted in the Town of Orleans by a qualified engineering firm experienced and knowledgeable in Krast geology. This survey will include the proposed wind district and extend to one mile geologically beyond the surrounding wind project.

Well testing be performed preconstruction of all wells within one mile of the project area by a unbiased firm chosen by the Town and paid for by the developer applicant.

Complaint Board: Complaint resolution including mitigation and any fines assessed to the developer to be handled at the discretion of the Complaint Board and the Town Board.

References:
1. U.S. Geological Survey, US Department of Interior, Ref;"Ground Water Quality in the St. Lawrence River Basin 2005-06" pdf
2. New York and New England Carbonate-Rock Aquifer; http://pubs.usgs.gov/ha/ha730/ch_m/gif/M085.GIF
3. NY State Department of Conservation Comment Report on the DEIS Horse Creek Wind Farm PPM Energy/Iberdola 2007; pages 16-18 pdf "Geology and Ground Water Impacts".
4. The Town of Cherry Valley, NY hired an engineering firm to perform a pre-construction survey for ground water impacts, pdf and http://otsego2000.org/documents/NikPressleyReport.pdf
5. Town of Bethany, Wind Committee Report pdf, page 17
6. Town of Union, WI Large Wind Turbine Citizens Committee Report; page 88 pdf

Part Two I. Lightning Protection Recommendation:

The Town shall require adequate conducting path from the tip of each turbine to the ground, using a multi-receptor system, to minimize lightning damage to turbines. The Town shall require turbines be sited at 3000 ft or 10 times the diameter of rotor blade, whichever is greater, from residential, historic, schools and wildlife refuse areas.

Complaint Board: Complaint resolution including mitigation and any fines assessed to the developer to be handled at the discretion of the Complaint Board and the Town Board.

References:

1. The National Lightning Safety Institute " Lightning Hazard Reduction at Wind Farms; pdf www.lightningsafety.com/nlsi_lhm/wind1.html
2. Severe damage to a blade "Taming The Power of Lightening" by LM Glassfiber manufactures of turbine blades, pdf http://www.lmglasfiber.com/Products/Lightning.aspx
3. When lightning strikes wind turbines II pdf and www.wind-watch.org/news/2009/04/14/when-lightning-strikes-wind-turbines-ii/
4. Town of Bethany, Wind Committee Report; pdf, page 25

Part Two J. Lighting Turbine Towers Recommendation:

The Town require the WECS developer to select a configuration of minimal lighting which meets FAA requirements. Use red lights being tested by FAA. Any strobing light will be required to be equipped with an RF choke and an adequate neutral pursuant to National Electric code IEEE 519 standards. Minimum downward directed security lighting for ground level facilities shall be allowed as approved on the site plan.

Complaint Board: Complaint resolution including mitigation and any fines assessed to the developer to be handled at the discretion of the Complaint Board and the Town Board.

References:

1. American Wind Energy Association publication; "Wind Turbine Lighting" 5/14/05 pdf http://www.nrel.gov/docs/fy02osti/31115.pdf
2. FAA Advisory Circular: Obstruction Marking and Lighting pdf www.windaction.org/documents/7912
3. Development of Obstruction Lighting Standards for Wind Turbine Farms pdf www.airtech.tc.faa.gov/safety/downloads/TN05-50.pdf -pg 16 and 17

Part Two K. Storm Water, Runoff Erosion Recommendation:

Construction site monitoring and inspection by a professional, who is independent of the project developer, is essential for effective storm water and erosion management control. Because of the hydrologic variability, a standard site-specific EIS (Environmental Impact Study) should be required. The WECS Applicant should be required to provide a description of the impacts that the proposed Wind Energy Facility may cause and a description of how the Applicant will mitigate impacts. This analysis shall include: a description of baseline conditions and the impacts that the proposed use may cause. The Applicant should be required to provide a preliminary plan showing any existing and proposed grading for the Wind Energy Facility site. A drainage and erosion control plan should be required, accompanied by a description of practices that will be utilized to prevent erosion and run- off during construction. If there are any modifications to this plan, the Applicant will provide a final drainage and erosion control plan prior to commencement of construction. Soil loss predictions for each turbine location must be made using RUSLE (*Revised Universal Soil Loss)* equations. Some state required studies require a full year data set using a plan to address all points covered by the Storm Water Pollution Prevention Plan (SWPPP) check list as per New York state standards.

Complaint Board: Complaint resolution including mitigation and any fines assessed to the developer to be handled at the discretion of the Complaint Board and the Town Board.

References:

1. Section 3-H Erosion and Sedimentation Control Plan, including Phosphorus Impact Analysis and Control Plan - pdf www.maine.gov/doc/lurc/projects/Evergreen/Part%20H%20Erosion%20and%20Sedimentation%20Control.doc
2. Highland Wind Farm Construction and project http://www.braymanconstruction.com/pdf/HighlandWind.pdf.
3. The New York State Standards and Specifications for Erosion and Sediment Control pdf www.dec.ny.gov/chemical/29066.html
4. FHWA/Environmental Review Toolkit/project development/ NEPA- pdf www.environment.fhwa.dot.gov/projdev/docueis.asp
5. Developing your Storm Water Pollution Prevention Plan pdf http:128.113.2.9/~kilduff/Stormwater/EPA%20swppp%20guide.pdf
6. Erosion and Water Quality Concerns for Industrial Scale Wind Turbines and Wind Test Towers pdf www.vermontwindpolicy.org/workingpapers/erosion.pdf
7. "Wind energy and the environment" pdf www.awea.org/faq/wwt_environment.html

Part Two L. Road Upkeep & Repair Recommendation:

The town require the WECS developer to submit proposed construction routes to the town for approval, restore all roads to county and town specifications, within one month of the developer's last use of such road, and submit a surety bond or other financial instrument to ensure that road repair is completed. The town require the WECS developer to submit an analysis of impact on local transportation regarding impacts anticipated during construction, reconstruction, modification or operation of WECS. Transportation impacts to be considered shall include potential damage to local road surfaces, road beds and associated structures, potential traffic tie-ups by haulers of WECS materials, impact on school bus routes and visitors to the WECS facility.

Complaint Board: Complaint resolution including mitigation and any fines assessed to the developer to be handled at the discretion of the Complaint Board and the Town Board.

References:

1. "Wind Energy Handbook: Guideline Options for Kansas Cities and Counties" Pages 23 and 24. (pdf http://www.kansasenergy.org/Kansas_Siting_Guidelines.PDF).
2. FEMA Region II Hazard Mitigation Plan Toolkit: Risk Assessment, http://www.fema.gov/about/regions/regionii/mitigation.shtm
3. Town of Bethany, Wind Committee Report; pdf Page 29

Part Two M. Public Access At Turbine Sites - Security (Vandalism /Terrorism) Recommendation:

The Town shall require the WECS operator, in addition to randomized two-token authentication for Internet protection, to enact and maintain physical security protocols including locks and remote intrusion monitoring of the control center.

The town shall require the WECS operator to place visual monitoring devices on turbines.

The town shall require the developer to install a 12 foot high chain link fence surrounding the concrete base of the turbine.

Complaint Board: Complaint resolution including mitigation and any fines assessed to the developer to be handled at the discretion of the Complaint Board and the Town Board.

References:

1. General Electric Corp., Harrisburg, PA "Wind Turbine Maintenance System" pdf http://www.faqs.org/patents/app/20090153656, pdf
2. Town of Bethany, Wind Committee Report; pdf Page 30

Part Two N. Radon Recommendation:

The town shall require the developer to perform pre and post construction of not less than 6 months testing for radon gas in homes that are located within one mile of all blasting locations. The developer will provide results of both the pre and post construction testing to the Town and to the resident. If radon testing is positive from the post construction testing, the developer is financially responsible to pay all radon mitigation fees.

Complaint Board: Complaint resolution including mitigation and any fines assessed to the developer to be handled at the discretion of the Complaint Board and the Town Board.

References:

1. World Health Organization "Radon Handbook", pdf http://whqlibdoc.who.int/publications/2009/9789241547673_eng.pdf
2. NYS Attorney General Andrew Cuomo "Radon: The Invisible Intruder" (Ref pdf http://www.oag.state.ny.us/environmental/radon_brochure.pdf)
3. New York State Department of Health: Dr. Michael Kitto and Dr. Charles Kunz, Laboratory of Inorganic and Nuclear Chemistry pdf http://www.wadsworth.org/databank/aug-00.html
4. US Environmental Protection Agency "A citizens Guide to Radon" March 26, 2009 pdf http://www.epa.gov/radon/pubs/citguide.html
5. United Nations (pdf http://www.unscear.org/docs/reports/2006/09-81160_Report_Annex_E_2006_Web.pdf).

Part Two Section III. Small Wind Energy Conversion Systems Article IV Local Law Recommendation:

Complaint Board: Complaint resolution including mitigation and any fines assessed to the owner of the small WECS to be handled at the discretion of the Complaint Board and the Town Board.

References:

1. NYSERDA "On Site Small Wind in New York-Cash Incentives Available". http://www.powernaturally.org/Programs/Wind/incentives.asp?i=8
2. In the Public Interest How and Why to Permit for Small Wind Systems A Guide for State and Local Governments" (pdf)
3. New York State Environmental Conservation (DEC) noise guidelines "Assessing and Mitigating Noise Impacts" (pdf)
4. Orleans Local Law page 14 pdf

Part One Section C. Complaint Resolution Recommendations

The Town Board shall select four residents from the Town of Orleans to serve as a Complaint Board. In addition to the four residents there shall be one member of the Town Board, Planning Board and Zoning Board of Appeals.

The WECS licensee will keep in an interest bearing escrow account, at a local bank, the amount of $100,000.00 in which to pay for the services of experts that may be employed by the Town to study or verify complaints by non participating residents. The balance of $100,000.00 will be maintained at all times and the Town will control the use of the funds.

Should a non-participating resident have a complaint against the WECS licensee, they shall first bring their complaint to the Town Clerk who will notify the Town Board. The Town Board will refer the complaint to the Complaint Board. If the Complaint Board finds it to be valid, they will notify the WECS licensee of the complaint. The licensee shall have the opportunity to mitigate the complaint. The time frame of mitigation and any fines assessed will be dependent on the nature of the complaint and how it is specified in this local law. The complaints may include, but will not be limited to: excessive noise, flicker or shadow effect, change in water quantity or quality, loss of or diminished telephone, TV, radio reception, interference with a medical device, changes in value to the residence, new presence of radon gas. Should it be necessary for the complaint to be verified by an expert, the Town shall select and employ a non biased firm to do testing, collect data or whatever else may be deemed necessary to determine the validity of the complaint. The funds for payment of these services will come from the established escrow account.

Should the WECS licensee be unable to mitigate the complaint in the time frame established for each complaint per the local law, fines to the Town and payments to the resident will be made by the licensee at the direction of the Complaint Board.

Orleans Citizens Wind Committee
J. Stephen Bingeman, Chair
Judy Tubolino, Vice-Chair
Darryl Hyde
Patty Booras-Miller
Rosemary Forbes
William DiTrinco