

HOST FARMER'S LAND BASE TOO SMALL OR PROPOSED 3 MW INDUSTRIAL WIND TURBINES TOO BIG??

The 3 MW Enercon 101 industrial wind turbines (IWT's) that Niagara Region Wind Corporation (NRWC) is proposing for the West Lincoln community are the largest IWT's to be erected in North America.

The following chart looks at the distance at which the IWT's have been sited from the host farmer's property line; the distance one IWT has been located from the next IWT; the distance IWT's have been located from the nearest receptor; and the IWT's with a noise sound level of 40.0 dBA or greater. These four factors frequently contribute to problems with IWT's and non-participating neighbours.

A significant number of the proposed wind turbine sites are problematic. A total of seventy-five (75) of the proposed IWT's sites have at least one of the above issues. Forty-nine of the proposed IWT sites have two or more of the above problems. Many of the proposed wind turbine locations require "mitigation" strategies, and do not comply completely with the Renewable Energy Approval (REA) regulations, requirements and recommendations.

The column "Distance to Property Line" uses the information provided by NRWC in Appendix B – Table Summarizing Individual Property Line Setback Assessments in the NRWC DESIGN AND OPERATIONS REPORT File No. 160950269, December 2012 Prepared for: Niagara Region Wind Corporation, 277 Lakeshore Road East, Suite 211, Oakville, ON L6J 6J3. Prepared by: Stantec Consulting Ltd., 300-675 Cochrane Drive, West Tower, Markham ON L3R 0B8

According to the Individual Property Line Setback Assessment fifty- four (54) of the seventy-seven proposed IWT's are located less than 135 meters from a non-participating property. This number misrepresents the total number of IWT's that are less than 135 meters from the host farmer's property line because only those IWT's next to non-participating neighbour's properties are included. T 12, T 36, T 41, T 53, T 66 and T 80 are all less than 135 meters from the host farmer's property line, but do NOT appear in the assessment because the neighbour is also a host farmer. So at least 60 of the proposed IWT's have less than 135 meters to the host farmer's property line. What is the status on the remaining 17 IWT's? If nearly 100 percent of NRWC's industrial wind turbine locations encroach on the neighbour's property - then this makes a strong case that the IWT's are too big to be located on so small a land base or are being located too close to the non-participating neighbour. If the IWT's do not fit on the host farmer's property then NRWC has chosen the wrong location to install 3M Enercon 101 industrial wind turbines.

The hub height of the proposed IWT's is 135 meters (using the worst case scenario). This does NOT include the 50 meter blade that will be attached to the hub, so **the total height of the IWT's will be 185 meters**. For these IWT's to fit exclusively onto the host farmer's property they would need to be located more than 185 meters from the host farmer's property line. . The average site location for the turbines mentioned in the Individual Property Line Setback Assessments is 80 meters from the host farmer's property line. In the event of a catastrophic failure, the spacing proposed by NRWC allows 105 meters of turbine tower, nacelle and blades to land on the non-participating neighbour's property. The hub and rotor weigh 144 tonnes and the flammable oils and 750 litres of hydraulic oil in the nacelle will end up contaminating the non-participating neighbour's property! The blade is made of non-recyclable material

so the potential exists for the neighbour to have his/her property contaminated with this material as well. Secondary brush fires originating from industrial wind turbine fires can also cause significant damage. As a precautionary measure the 3 MW Enercon industrial wind turbines should be sited 185 meters from the host farmer's property line so the toxic debris falls on the host farmer's property, not the neighbour.

The encroachment on the neighbouring property has safety implications due to ice throw, blade throw, fire, catastrophic collapse, etc.. (NRWC claims that these IWT's are equipped with a de-icing mechanism so ice throw will not be an issue, but all mechanical systems fail. My car has brakes but as a precautionary measure I leave enough distance between vehicles so I can take evasive action.) These safety issues have implications on the non-participating neighbour's use of their property. People use their property to pasture animals and for recreational use such as snowmobiling, horseback riding, hiking. Will these activities have to be curtailed? Will a safety zone be required that will impact the neighbour's use of their land?

According to the Vestas Mechanical Operating and Maintenance Manual the V90 – 3.0 MW, VCRS 60 has a 400 meter safety zone -

" Do not stay within a radius of 400m (1300ft) from the turbine unless it is necessary. If you have to inspect an operating turbine from the ground, do not stay under the rotor plane but observe the rotor from the front.

Make sure that children do not stay by or play nearby the turbine. If necessary, fence the foundation."

Perhaps the IWT's should be located 400 meters from the host farmer's property line. An encroachment of 320 meters into the non-participating neighbour's property amounts to expropriation without compensation.

The encroachment on the neighbouring property has insurance implications. Will the non-participating neighbour be expected to carry additional insurance to cover a catastrophic collapse of the IWT? Or will the non-participating receptor be expected to sue NRWC or the host farmer for compensation?

The encroachment on the neighbouring property has financial implications. What will be the response of financial institutions if a non-participating neighbour applies for a bank loan using their property as collateral? Will the non-participating neighbour's property be considered a "high risk" property because IWT's encroach on the property and will people experience difficulties securing credit or a mortgage?

#2 DISTANCE TO NEXT TURBINE – calculated using the UTM coordinates for individual industrial wind turbines provided by Stantec December 2012 - File No. 160950269 Table 3.2 Wind turbine locations.

The distance between IWT's is important because the turbulence of one turbine will have an effect on the efficiency of the neighbouring turbine. Larger turbines make more noise, vibration and low frequency sound so IWT's that are too close together will exacerbate these issues.

The Ministry of Environment (MOE) document published Sept 2009 Section 47.3 (1) Environmental Protection Act R.S.O. 1990 relates to the allowable noise and set back distances of IWT's. In this document the model used by the MOE has a spacing of 400 meters between much smaller industrial wind turbines than those to be used in the West Lincoln proposal.

According to this document

“ 4.4 A simple layout was formulated for each group of wind turbines based on an array in a grid pattern with 400 meters separation between the units. Based on experience with wind farms in Ontario, this separation between wind turbines is normal for ensuring proper wind distribution amongst the turbines. **The separation distance between wind turbines is often greater due to other project and site constraints.**”

According to an email from Randi Rahamim, Director of Communications for Niagara Region Wind Corporation (NRWC) at info@nrwc.ca regarding NRWC's position on the spacing of IWT's:

“In developing the turbine layout, the general siting of individual or groups of turbines considered the separation distances recommended by the turbine manufacturer (Enercon). These recommendations were balanced against other regulatory setbacks, such as noise, property line and other environmental setbacks, so that the layout of turbines and other project components comply with all required setbacks and noise requirements.

The separation distances recommended by turbine manufacturers are general guidelines. They are intended to represent conservative spacing for which one can be confident that turbulence created by upwind turbines on downwind turbines will not impose a structural or mechanical integrity issue on the downwind turbines. **Since some of the spacing for this project is tighter than the conservative guidelines,** Enercon implemented computational fluid dynamics (CFD) models to study the fluid-structure interactions based on the proposed turbine layout. This was completed to determine the impact of turbulence on the integrity of the downwind turbines with spacing at or within the conservative guidelines.”

Ms Rahamim, Director of Communications for NRWC, has very carefully acknowledged that Enercon has conducted computerized tests to determine the impact of turbulence on the integrity of the downwind turbines with spacing at or within the conservative guidelines. BUT has not mentioned the effect that the spacing for this project, which is “tighter than the conservative guidelines”, will have on the noise produced. The 3 MW Enercon 101 industrial wind turbines proposed for West Lincoln are the largest IWT's to be used onshore in North America.

According to Dr. Meneveau of John Hopkins University (USA) in the Bulletin of the American Physical Society Nov. 10, 2010;55(16) “large wind farm operators are going to have to space their turbines further apart Placing the wind turbines 15 rotor diameters apart – more than twice as far apart as the current layouts – results in more cost-efficient power generation”. **The current installation pattern increases noise, decreases efficiency, produces shadow flicker,** etc. According to Dr. Meneveau's

calculations the 3 MW Enercon 101 industrial wind turbines proposed for West Lincoln should be 101 meters X 15 = 1500 meters apart. <http://meetings.aps.org/link/BAPS.2010.DFD.QD.5>

According to one of the ENERCON sales representatives at the Sept 20, 2012 Open House meeting hosted by NRWC, the 3 MW ENERCON 101 industrial wind turbines need to be sited 6 rotor diameters apart so the turbulence of one does not interfere with the efficiency of the next one. The IWT rotor diameter for the 3 MW Enercon 101 is 101 metres X 6 = 606 meters apart. Therefore, according to the Enercon sales representative the IWT's proposed for West Lincoln should be a minimum distance of 606 meters apart.

NRWC admits that some of the spacing for this project is "tighter than the conservative guidelines". **Seventeen (17) pairs of the Enercon Industrial Wind Turbines in the proposed installation by NRWC's are being installed with less than 400 meters between them.** (The spacing used in the MOE noise document for smaller IWT's.)

Thirty-one (31) pairs of 3MW Enercon Industrial Wind Turbines in the proposed installation by NRWC's are being installed with less than 606 meters between them. (The spacing recommended by the Enercon sales representative.) Some of these proposed installations are sites that have 5 + IWT's and they are all too close together!

#3 DISTANCE TO THE NEAREST RECEPTOR - measurements are included in NRWC DESIGN AND OPERATIONS REPORT File No. 160950269 - Appendix C "Results for all Points of Reception (PORs)" p 168 to p 183. According to the measurements provided eleven (11) of the 77 proposed IWT's are less than 550 meters from a family dwelling.

#4 NOISE SOUND LEVEL dBA – measurements are also included in NRWC DESIGN AND OPERATIONS REPORT File No. 160950269 - Appendix C "Results for all Points of Reception (PORs)" p 168 to p 183. According to the measurements provided twenty-four (24) of the IWT's have a Noise Sound Level of 40.0 dBA or greater.

According to information obtained from ENERCON the 3 MW Enercon 101 is rated at a Sound Power Level of 106 dBA +/- 1, yet in the Stantec document 105 dBA is used for their calculations to determine set back distance and noise levels. According to the noise document from the MOE, with the 106 dBA sound power level, non-participating receptors should have a minimum setback distance of more than 850 meters (eight hundred and fifty meters) if there are five IWT's within 3 km of their residence, and more than 1000 (one thousand) meters if there are more than ten IWT's within 3 km of their residence. Based on much smaller IWT's.

According to the MOE IWT's can be installed a minimum of 550 meters from your home with a maximum of 40 dBA noise sound level. The 24 IWT's listed in columns 3 and 4 are either closer than 550 meters to someone's home or according to a computer program that has been severely criticized, will operate at 40.0 dBA or greater noise sound level. If you check you will find that many of these are on host farmer's properties, BUT it is still an additional indication that **host farmers do not have a sufficiently large enough land base to install these 3 MW IWT's far enough from their own homes to**

follow the health and safety rules applied by the MOE to non-participating receptors. Eg. T 65 is being located 280 meters from the center of a dwelling with 45.8 dBA. Sound increases exponentially, and an increase of 3 dBA is equal to a doubling of the sound so 45.8 dBA is almost three times as loud as 40.0 dBA.

The host farmers have entered into a separate deal with the IWT corporations, and many people would say "they get what they deserve", and other less complimentary statements BUT health of family members should not be up for sale. Land use is a provincial issue but, violation of people's democratic rights, and radiation of noise, vibration, etc are under the Federal jurisdiction.

The MOE has allowed for two sets of rules - one set for the non-participating receptors and another set for the host farmers and their families. We have rules for a reason and generally they are for fair play, for health, for safety, etc.. When you create two sets of rules, you are generally trying to circumvent something or disenfranchise someone. (Remember our history is full of examples where two sets of rules were used for discriminatory purposes.) Until such time as NRWC has re-located the industrial wind turbines which have been identified by the consultant for West Lincoln Township as having siting flaws ("issues with the 44 turbine locations due to their proximity to homes, wetlands and forests in West Lincoln and the use of South Grimsby Road 3 as an alternative transmission route"), NRWC's submission, when submitted to the MOE, should be denied.

As individuals and through our municipal government we have been denied the opportunity to participate in the process of determining the future of our community. We have been denied meaningful involvement in this top down inflicted wind energy project. Consultation does not exist. Transparency does not exist. Communications consist of partial truths. Or simply silence. It is shameful. Our municipality and the non-participating receptors are not willing partners in this proposed transformation of West Lincoln from agricultural land use to an industrial wasteland.

The MOE's Renewable Energy Approval (REA) regulations, recommendations and requirements are inadequate for today's wind turbines and were hastily conceived but, even worse, they do not appear to be rigorously and rigidly applied. Any proposed wind turbine location which requires "mitigation" strategies should be rejected. Any proposed wind turbine location which does not comply completely, strictly and exactly with REA regulations, requirements and recommendations should be rejected. If sufficient numbers of proposed wind turbine sites are rejected, then the wind energy company's application should be denied for significant numbers of omissions, incompleteness and/or non-compliant wind turbine sites.

There are 3579 receptors (households) within 2 km of the proposed turbine locations and transformer stations in this proposal. How many of the people in these homes should suffer health effects, environmental degradation, loss of property value, or any other negative impact due to IWT's that have been squeezed onto host farmer's properties with insufficient setbacks to prevent encroachment onto the non-participating neighbour's property? The 3 MW Enercon 101 industrial wind turbines are too big, too close to family homes and too many.

Respectfully submitted - Catherine Mitchell - RR#3, Wellandport, ON L0R 2J0 jcdykstra@hotmail.com

INDUSTRIAL WIND TURBINE #	DISTANCE TO PROPERTY LINE (IWT's may be 185 m tall)	DISTANCE TO NEXT TURBINE	DISTANCE to NEAREST RECEPTOR – m * LESS than 550 m)	NOISE SOUND LEVEL dBA 40.0 dBA +
T 01	64 m	(T 76) 654.5 m	624 743 (O)	40.5 39.9
T 02	92 m	(T 33) 411 m	703	41.2
T 03	56 m		* 494	40.0
T 04	89 m			
T 05	77 m			
T 06	70 m		715 (O)	39.8
T 07			* 313 575 571 m (V) 674 (O)	44.1 38.9 39.3 39.8
T 08	66 m		569 (O)	39.5
T 09		(T 51) 289 m		
T 10	114 m	(T 37) 246 m	568 (O)	39.9
T 11	119 m	(T 41) 291 m (T 91) 343.5 m (T 12) 360 m (T 72) 513 m		
T 12	< 135 m	(T 11) 360 m (T 13) 396 m (T 91) 641 m		
T 13	66 m	(T 12) 396 m		
T 14	90 m	(T 44) 397 m (T 16) 436 m		
T 16	85 m	(T 14) 436 m (T 48) 535.5 m	604 (O)	39.9
T 18	75 m		569 m 733 (O)	40.4 40.4
T 19	65 m		583 m	39.9
T 20	80 m		581 (V) 594 (O)	39.7 39.7
T 21	66 m	(T 22) 320 m (T 61) 322 m		
T 22	65 m	(T 21) 320 m (T 43) 442 m (T 44) 480 m		
T 23	62 m		* 524	41.0
T 24	?		564 (V) 608 (V)	39.9 39.9
T 27	61 m	(T 28) 388 m		
T 28	61 m	(T 27) 388 m		
T 29	81 m			
T 31	93 m		587	40.1

INDUSTRIAL WIND TURBINE #	DISTANCE TO PROPERTY LINE	DISTANCE TO NEXT TURBINE	DISTANCE to NEAREST RECEPTOR – m * LESS than 550 m)	NOISE SOUND LEVEL dBA > 40.0 dBA
T 32	75 m			40.0
T 33	62 m	(T 02) 411 m	* 399 644	43.7 40.8
T 34	65 m	(T 35) 688 m	703	40.7
T 35	?	(T 34) 688 m	* 312 * 511 * 537 576 (O)	45.3 40.7 40.7 40.0
T 36	< 135 m		587 567 (V)	40.1 39.7
T 37	62 m	(T 10) 246 m	591 (V)	39.9
T 38	102 m		563 (O)	39.7
T 39	?		559 (O) 582 (O) 622 (O)	40.2 ?? 39.9 39.9
T 41	< 135 m	(T 11) 291 m (T 72) 319 m (T 91) 594 m		
T 42	?			
T 43	?	(T 48) 354 m (T 22) 442 m		
T 44	95 m	(T 14) 397.8 m (T 22) 480.6 m		
T 45	?	(T 46) 529 m		
T 46	?	(T 45) 529 m (T 47) 579.6 m	674 (O)	40.0
T 47		(T 46) 579.6 m		
T 48	117 m	(T 43) 354 m (T 16) 535.5 m		
T 49	?			
T 50	?			
T 51	?	(T 09) 289 m	575 m	40.3
T 52	66 m	(T 53) 273 m	677 (O)	39.8
T 53	< 135 m	(T 52) 273 m	630 m	40.1
T 54	67 m		593 m	39.5
T 55	71 m		* 445 m	41.5
T 56	?		* 462 m	40.5
T 57	?		* 357 m	43.4
T 58	?		595 m	39.7
T 59	61 m	(T 60) 313 m	658 (O)	39.8
T 60	68 m	(T 59) 313 m	587 m	40.2
T 61	65 m	(T 21) 322 m		
T 62	89 m	(T 63) 386 m		

INDUSTRIAL WIND TURBINE #	DISTANCE TO PROPERTY LINE	DISTANCE TO NEXT TURBINE	DISTANCE to NEAREST RECEPTOR – m * LESS than 550 m)	NOISE SOUND LEVEL dBA > 40.0 dBA
T 63	115 m	(T 62) 386 m (T 96) 408 m		
T 65	?		* 280 m * 445 m * 502 m	45.8 42.6 41.7
T 66	< 135 m	(T 94) 442.5 m (T 85) 579 m		
T 72	?	(T 41) 319 m (T 11) 513 m		
T 74	63 m			
T 75	?		* 466 m	41.3
T 76	119 m	(T 01) 654.5 m	586 m 602 m 640 m 681 m 715 m (V)	40.9 41.3 40.9 40.1 39.9
T 78	104 m		575 (O)	39.5
T 79	102 m	(T 80) 399 m	580 (O)	39.8
T 80	< 135 m	(T 79) 399 m		
T 81	63 m		597 (O)	38.4
T 82	97 m			
T 83	78 m	(T 88) 344 m		
T 84	82 m			
T 85	101 m	(T 94) 515.6 m (T 66) 579 m		
T 88	70 m	(T 83) 344 m		
T 89	75 m			
T 91	?	(T 12) 641 m (T 11) 343.5 m (T 41) 594 m		
T 93	67 m		* 550 m 554 m (V) 613 m (V)	40.1 39.7 39.4
T 94	62 m	(T 66) 442.5 m	* 322 m 613 m (V)	44.7 39.8
T 95	68 m		1007 m	39.3 dBA ??
T 96	?	(T 63) 408 m		
T 97	99 m			
T 98	116 m			
T 99	92 m			
			(O) receptor non-participating (V) Vacant land	

