Some Of The Case Studies That Have Convinced Me That Industrial Wind Turbines Make People Sick, Which Supports My Belief That We Can Prove In A Court Of Law That These Wind Turbines Are Causing Annoyance and Illnesses.

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1. Cape Bridgewater Study in Australia

This wind farm was built in Cape Bridgewater Australia which was built by Pacific Hydro and is made up of 29 Industrial Wind Turbines that are 2.0 MW in size or a total capacity of 58 MW. What is unique about this study is it is only one of a few in the world where the Wind Turbine Developer (Pacific Hydro)agreed to provide wind turbine performance data during the acoustical study. Also Pacific Hydro allowed affected residents to select the acoustician who would undertake the study which is Steve Cooper with Acoustic Group Pty Ltd in Lilyfield Australia. The size of the Industrial Wind Turbines is important because studies have shown that the larger wind turbines produce more noise in the infrasound range and low frequency noise range and they operate at lower rpm's which takes them into the range of maximum nausogenicity identified by a 1986 Navy Study and supported in a graph by Robert Rand showing Blade Pass Rate (in Hz) and Turbine Nameplate Rating (MW). Also unique to this study residents were asked to record (using severity rankings) perceived noise impacts, vibration impacts and other disturbances which for the purpose of this study have been labeled sensation. Sensation includes headache, pressure in the head ears or chest, rining in the ears, heart racing or a sensation of heaviness in a diary format. The study used people who lodged complaints concerning the wind farm specifically to investigate a possible relationship to the observations and the wind farm that may not be apparent with a larger sample of people around the wind farm, in that it is acknowledged not all people complain about the turbines. The diary procedure provided regular observations (every 1 to 2 hours) not just the perceived changes using a 1 to 5 severity scale looking at sensation, perceived noise impacts, vibration impacts and other disturbances which were labled sensation. A ranking of 5 is a level that would make the specific residents in the study want to leave their premises to obtain respite.

a. A pattern of high severity when wind turbines were seeking to start (and therefore could drop in and out of generation).

b. A pattern of high severity with an increase in power output of the wind farm in the order of 20 % increase of power.

c. A pattern of severity with a decrease in the power output of the wind farm in the order of 20 %.

d. A pattern of severity when the turbines were operating at maximum power and the wind increased above 12 m/s.

e. Examination of the acoustic environment in terms of narrow band analysis confirmed the results of previous investigation (such as Falmouth & Shirley). It demonstrated that there is a unique signature attributed to wind farms that involves a peak at the blade pass frequency and the first five harmonics of that frequency. This unique infrasound pattern has been labled by the author in other investigations as the Wind Turbine Signature. The shutdown testing confirmed that the Wind Turbine signature is present when the wind turbines are operating but does not occur in the natural environment.The pattern confirms the presence of an amplitude modulated signal which is not present when the wind turbines are not operating.

f. Significant pressure pulsations (peak to trough) were found that were also found in Falmouth and Shirley Wind. These pressure pulsations are the main focus of Professor Alec Salt that may lead to an imbalance in inner ear fluid levels and pressure leading to Endocochlear hydrops.

2. Falmouth Massachusetts

This Wind Farm is located in Falmouth Massachusetts which was built by the Town of Falmouth and is made up of 2 Industrial Wind Turbines that are each 1.65 MW in size or a total of 3.30 MW. This project is unique in that the developer is the Town of Falmouth instead of a Local Utility or a Developer. What is unique about this study is that the town (the owner of the installation) participated in the noise study which has only happened in two cases that I know of. The noise testing identified amplitude modulation noise with very significant pressure pulsations from peak to trough in the 0 to 5 Hz range (infrasound range). The pressure pulsation was followed by harmonics that had even higher peak to trough pulsations which were not present when the wind turbines are shut down. The peak to trouigh pressure pulsations were around 12 dB. This is referred to as a Wind Turbine Signature in the Cape Bridgewater study. The town Selectmen (Aldermen) voted to shutdown and remove the wind turbines but when the Towns people heard that taxes would be raised to fund the removal the people asked for a town vote which decided to keep the wind turbines running. On November 22, 2015 the Barnstable Superior Court Judge Christopher J. Muse issued a preliminary injunction to Sharply reduce the turbine's hours of operation. The Court found that the defendants in the case face a substantial risk that they will suffer irreparable physical and psychological harm if the injunction is not granted. Under the ruling, Falmouth's two wind turbines must be shut down from 7 p.m. to 7 a.m. Monday through Saturday and all day on Sundays, Thanksgiving, Christmas and New Years. This is believed to be the first time that a Court in the U.S. has ruled that there is sufficient evidence that wind turbines near residential areas are a health hazard to families living nearby.

3. The Sound From A Wind Turbine Can Make Other Objects Vibrate (Such As The Body) If the Sound Frequency Matches A Resonant Frequency Of An Object.

Doctor Jay Tibbetts has been studying cases of blurred vision which has occurred to one of the Acoustical Engineers during his testing at Shirley Wind, and a number of residents of Shirley Wind, and some residents near Fond du Lac wind turbines. Jay believes that the pressure pulsations off of the wind turbines maybe vibrating the vitreous humour of the eye ball and thus causing blurred vision and or lost depth perception. Jay's current focus is on one of the residents who has blurred vision in both eyes. Blurred vision is mentioned a number of times in the Affidavits submitted to the Brown County Health Department.

4. Affidavits Submitted by Brown County Residents in Shirley Wind Indicating That The Wind Turbines Have Adversely Affected Their Health.

To my knowledge there now are around 32 Affidavits (representing 50 individuals) submitted to the Brown County Health Department which does not include around 6 people that want to submit but will not if their information is not kept confidential. In my opinion 50 people for a 8 Wind Turbine Project is very significant. Also 80 complaints have been submitted to the Health Department.

5. Wind Turbines Continue To Get Larger and Larger (both in size and MW Output) And the Noise Is Dropping In Frequency And The Content Of Low Frequency And Infrasonic Noise Is Increasing.

A article titled "Low Frequency Noise From Large Wind Turbines" which appeared in the Journal Acoustical Society of America in June 2011. This study clearly shows that the noise in the infrasound range is increasing as the wind turbine size increases. Also the wind turbine rpm is decreasing pushing the noise down into the maximum

6. Adverse Health Effects of Industrial Wind Turbines: a preliminary report. A document Prepared for the International Commission on Biological Effects on Noise (ICBEN) July 24-28, 2011. Prepared by Michael Nissenbaum MD, Jeff Aramini PHD and Chris Hanning MD.

This was a study conducted at Mars Hill and Vinalhaven Maine. This study is a controlled study of the effects of Industrial Wind Turbine noise on sleep and health that showed that those living within 1.4 km (4593 feet) of IWT have suffered sleep disruption which is sufficiently severe as to affect their daytime functioning and mental health. Dr. Nissenbaum is a specialist in diagnostic imaging, whose training and work involves Developing and utilizing an understanding of the effects of energy desposition, including Sound on human tissues. He is a former Associate Director of MRI at a major Harvard Hospital, a former faculty member at Harvard University and a published author.

7. Closure of Mink Farm Located in Vildbjerg Denmark Due To Problems From A Wind Farm.

In the fall of 2013 a new Wind Farm started up in Vildbjerg Denmark that is made up of 4 Wind Turbines that were 3.0 MW in size (the largest wind turbines installed on land). A mink farm owned by Kaj Bank Olesen is 328 meters (1076 feet) from that Wind Farm. Upon start-up in the fall the mink became aggressive, attacking one another which resulted in many deaths then within a month there were 320 female minks that had miscarriages and 1600 stillborn baby minks were found to have been delivered. The number is probably higher since the minks ate some of the stillborn pups. In addition 963 mink were sterile and another 2280 rejected male minks and failed to mate.The stillborn had many deformities and most were dead on arrival. The lack of eyeballs was the most common malformation. The veterinarians ruled out food, water and viruses as possible causes, the only thing different at the farm was the installation of the Wind Farm. The Wind Turbines are VESTAS model V112 3.0 MW units. These incidents are alarming as they constitute definitive proof that industrial wind turbines are harmful to the health of animals living near the wind turbines. A growing number of deaths and deformities of baby animals near wind turbines as well as high sterility ratyes in some adult animals is heightening fears among people living near wind turbines about potential impacts on their own health and the health of their children. There have been many reports of negative impacts from wind turbines on geese and other instances where health problems among livestock were observed including cattle deaths, high rates of stillborns and miscarriages among horses, chickens laying eggs with no shells or soft shells and birth defects among goats.

One good example of problems with animals locally is the Kevin Ashenbrenner Farm in Glenmore. Kevin and his cousin have seen their milk production drop off significantly from a high of 85 to 90 lbs of milk per cow per day down to below 39 lbs/cow/day. Kevin has also seen 19 of his cows die. Kevin also lost a new bull that he purchased that died within 3 weeks. In all of these deaths they did not find a cause. Kevin also had a calf that had badly swollen front ankles which he moved to another location which was 7 miles away from the wind turbines, that swelling went down significantly.in just 10 days.

8. Professor Alec Salt at Washington University Medical School Department of Otolaryngology Study Using Guinea Pigs. His paper titled " Large Endolymphatic Potentials From Low_frequency and Infrasonic Tones in the Guinea Pig" published in the Journal of Acoustic Society America in March 2013.

In this study exposing guinea pigs to infrasound noise. Sensors were placed on their brain which indicated that they were irritated by their exposure to infrasound. He then did a post mortem autopsy on the inner ear and found damage to the inner ear hair cells. This type of study cannot be conducted on humans.

Research by Dr. Alec Salt and his colleagues at Washington University School of Medicine in St. Louis Missouri , has explained how inaudible sound causes the kinds of adverse health symptoms reported by people who are exposed to wind turbine noise. That research has shown that infrasound is largely inaudible because inner hair cells, Which are most directly coupled to the brain, are relatively insensitive to very high frequencies, but the outer hair cells are sensitive to low frequency and infrasound components that are below the level that can be heard. Dr. Salt's research has shown that an anatomical pathway exists from the outer hair cells through the brainstem for infrasound to reach the brain. That pathway means that it is biologically plausible for infrasound to produce a variety of sensations, including pulsation, annoyance, stress, panic, ear pressure or fullness, unsteadiness, vertigo, nausea, tinnitus, and general discomfort. Other symptoms may include memory loss, disturbed sleep, blood pressure elevation and heart arrhythmias.

Another finding by Dr. Salt's research is that the presence of higher pitched sounds (between 150 to 1500 Hz) can suppress infrasound. This means that the ear is maximally sensitive to infrasound when higher frequency sounds are absent. While a building's walls and roof block some of the outside high frequency noise from entering the building, infrasound easily penetrates the structure (little to no attenuation). In this situation the infrasound entering the home can be most disturbing to persons inside their homes, because the higher pitched sounds are attenuated by walls and other physical structures.

9. Amplitude Modulation of Infrasound & Low Frequency Noise

One of the theories to health effects is that the Amplitude Modulation of Infrasound and Low Frequency Noise has negative effects on the body. Neurophysiologist Professor Alec Salt and Lichtenhan have been investigating what happens when the proportion of sound energy is down in the lowest frequencies. They have found that the inner ear is exquisitely sensitive to the lower frequencies when there is very little ambient background noise and that infrasound generated by wind turbines cause amplitude modulation.Amplitude modulation is more dominant in wind turbine noise and is more disturbing.Acoustic Engineer Richard James claims that the majority of the acoustic energy is seen in the frequencies of 0.50 Hz to 3.0 Hz. According Alec Salt if the inner ear is exposed to infra and low frequency noise long enough it can develop an imbalance in fliud levels/pressures leading to Endocochlear Hydrops. This would explain the ear pressure and ear pain that some people experience.

An early focus on infrasound in literature was on audible noise and infrasound created by heating, ventilating, and air conditioning systems in industrial plants, eventually resulting in the coining of the term Sick Building Syndrome. Infrasound as well as low frequency sound (20 to 150 Hz), in these settings has been linked to a variety of symptoms, including fatigue, headache, nausea, concentration difficulties, disorientation,

seasickness, digestive disorders, coughing, visual problems and dizziness. In the late 1990's Waye and colleagues found that exposure to low frequency ventilation noise that varied in amplitude over time was more bothersome, less pleasant, impacted work performance more negatively and lead to lower social orientation than low frequency sounds that are constant in intensity.

Amplitude modulated is a term often used to describe wind turbine noise (including Infrasound), refers to a sound that varies in intensity over either a short or long time period. The audible sound and infrasound from wind turbines typically vary over rather short time periods, generally on the order of seconds or fractions of a second. Wind Turbines generate measureable amplitude-modulated sound and infrasound and nearby residents find it highly disturbing. Symptoms vary from person to person, but they are well known to occur in a significant portion of such residents. The symptoms include sleep disturbance, annoyance, headaches, ear pressure or pain, dizziness, nausea, anxiety, and a general feeling of distress or discomfort. Some of the rarer symptoms are blurred vision and memory loss. This modulated noise produces significant pressure pulsations from peak to trough at the blade bypass frequency followed by harmonics that have even greater pressure pulsation. Fro peak to trough these pressure pulsations vary from 10 dB peak to trough up to 18 dB peak to trough at Shirley Wind, Falmouth and Cape Bridgewater. The Cape Bridgewater study called this Wind Turbine Signature or WTS. These pressure pulsations disappear when the wind turbines are shutdown.

Car Sickness is another form of illness created by pressure pulsations through an open car window. This illness has never been medically proven but the auto industry has worked hard to eliminate this problem. Studies show that a moving car with the rear windows open creates high velocity air that behaves as a source of specifically strong tonal low frequency noise which is annoying and can cause nausea. These studies indicate that long-term exposure of the energy rich low frequency noise can lead to harm to human health, and not only to the hearing organ but also functionality of other organs such as the central nervous system.

Cooling Tower Companies also recognize that infrasound and low frequency noise from cooling towers can be a problem. To prevent possible problems these manufacturers sell a line of cooling towers that produce very low levels of infrasound and low frequency noise.Bob and Leona Ehrfurth who live at 2048 Mary Queen Road in Green Bay are experiencing pressure pulsations from a Cooling Tower that is located at 1731 Morrow Street. Noise tests conducted by acoustical engineer Richard James found very similar pressure pulsations to that found at a the Enz Family home near the Shirley Wind Turbines. Doctor Herbert Coussons and I brought the Enz Family and the Ehrfurth Family together into Dr. Coussons office to review their illnesses and we Found the illnesses to be very similar.

10. Epidemiologic Evidence

a. A case-crossover study example. A case crossover study is one of the most compelling sources of epidemiologic data. It consists of observing whether someone's outcomes change as their exposure status changes. There are thousands of case crossover studies throughout the world.

The home of Darren & Sue Ashley located at 3820 Schmidt Road. Darren Ashley who lived in the Shirley Wind Project area began to experience fluid build-up in his ears and ear pain when he was home at night after the wind turbines began operation. When Darren went to work which was located far from the Shirley Wind Project area, he noticed that the fluid in his ears would drain. This is called a Epidemiologic cross-over study.

b. A case-crossover study example: (3820 Schmidt Road)

After the Shirley Wind Turbines started up Allissa Ashley was not sleeping well and was tired all of the time and she told her mother that she had ear pressure and ear pain. According to her mother Allissa has never had ear infections even as a small child this all began after the wind turbines started up. Then one day in May 2011 the wind turbines were starting and stopping frequently and on that day when Allissa arrived home from school and she told her mother that right away she began to experience ear pain. According to the mother you cannot see the wind turbines through any of the home windows and there is no audible noise. Then Allissa told her mother that the ear pressure went away so her mother went outside and noticed that the wind turbines had stopped. So her mother told Allissa to tell her the next time that she felt pressure and or pain. A little while latter Allissa said the pain was back and the mother went outside and found the turbine running again. The within 30 seconds to a minute Allissa said the pain stopped and they looked outside and the turbines had shut off. It was at that time that Darren and Sue Ashley came to the conclusion that they needed to move their family out of the home. So the family moved into a camper away from the Shirley Wind Project and the families symptoms of headaches and ear pain went away but they still had sensitive ears. What is also unique about Allissa's experience is that her annoyance and pain correlate well with the Cape Bridgewater Study which found a annoyance level of 5 (the highest annoyance ranking) when the wind turbines were starting and stopping.This example also clearly shows that people can sense the wind turbine shutting off and turning on without any visual of their operation and without any audible noise and they can sense these on and off cycles within one minute. The Cape Bridgewater study calls this sensation.

c. A case-crossover example

Ben & Pamela Schauer and their 3 boys home at 6225 Highview Road. The entire Family experience health problems since the wind turbines started up. Pamela and the son Lance experience headaches when the wind turbines are operating and facing

their house (wind coming out of southeast).Pamela and Lance noticed that when they go into the home basement (below ground) their headaches go away within 10 minutes to 30 minutes. If they return upstairs when the wind turbines are running the headaches return within 30 mintues to 1 hour. The other son Michael also has headaches but when in school (away from the turbines) he has no headache problems. Lance also has no headache problems when in school. Ben experiences whooshing and pulsating sensation in his head that coincides to the rotation of the blades. He feels these pulsations on his body. Lance also experiences anxiety problems. His father Ben will take Lance on car rides away from the turbines to relieve the anxiety.

d. A case-crossover example:

The home of Dora Ashley located at 3712 Shirley Road. Since the Wind Turbines started up in November of 2010 Dora has experienced dizziness, ear pain and loss of sleep, increase in bold pressure and anxiety.. When she wants to feel better she goes to her daughters house in Wrightstown. On one visit which lasted three weeks her symptoms disappeared and her blood pressure dropped.

e. A case-crossover example:

In the Cappelle home at 5792 Glenmore Road Sarah and her son began to experience health problems when the wind turbines started up. Sarah began having problems with headaches,insomnia, ear pain, joint pain,muscle spasms, migrane headaches and vibration sensation through her entire body. Her youngest son began waking up at night every two to three hours some times screeming and panic attacks. When they moved away in 2012 the symptoms went away but they did notice that they were more sensitive when they went back to the wind turbine project site..

f. A case-crossover example:

In the Desotelle home at 4423 Shirley Road, Terry Desotelle began to experience health problems when the wind turbines started up. She experienced loss of sleep, ear problems, dizziness, nausea and anxiety. On a 5 day trip to Indiana her symptoms went away.

g. A case-crossover example:

In the Enz home at 6034 Fairview Road Dave & Rosemary Enz began to experience health problems when the wind turbines started up.They did not know of any health problems during the wind turbine project installation so they did not expect to have any problems. When the turbines started up both Dave & Rosemary became ill. Dave experienced a feeling of being unsteady and unstable,head pressure, blurred vision, an overwhelming desire to flee, panic attacks, ear pressure and pain, confusion, nausea and an inability to concentrate. Rosemary symtoms include memory loss, ear pressure and pain, overwhelming desire to flee, panic attacks, confusion, nausea and a inability to concentrate. In February 2011 Dave and Rosemary went on a weekend vacation and after a few days they noticed that they felt better and when they returned the symptoms returned. Dave and Rosemary then spent a month in the south away from the wind turbines during which the symptoms went away and they felt good again.

h. A case-crossover example:

The home of Darren & Jennifer Kornowske.Darren's symptoms include loss of sleep, headaches, migraines, anxiety, loss of concentration, muscle pain, hearing loss, loss of balance, clogging of the ears and depression. When he leaves for work in Appleton or Green Bay his symptoms start to leave starting with anxiety. When he works out of town like Atlanta, Chicago etc. after about one day he starts to regain better balance, his ears start to unclog, he sleeps all night without restlessness, headaches strat going away, muscles and joints stop aching and his over all work experience and production picks up.

Jennifer's symptoms after the wind turbine start up include loss of sleep, headaches, migraines, anxiety, loss of motivation, memory loss, loss of concentration, muscle pain, hearing loss, and loss of balance. After the first few weeks of the wind turbines operating the entire family took a get away trip to Appleton and stayed at a hotel for a couple of days. The entire family slept so good and felt so refreshed that after two days they wondered what could be causing the change at their home.

i. A case-crossover study:

In the home of Steve and Sarah Peters at 6141 Morrison Road health problems began when the wind turbines started up. On stat-up of the wind turbines Steve started to experience anxiety, pressure in ears, headaches, sinus problems and malaise. Sarah experiences muscle and joint pain, insomnia, dizziness and vertigo to the point of almost passing out. When they are not at home and away from the turbines Steve's anxiety drops off and he is less prone to headaches. When Sarah is away from their home her dizziness drops off.

When the wind turbines started up their dog started to have violent seizures which he never had before the turbines start up. They took their dog to the veterinarian for an exam and the vet could not find anything physically wrong with him and the vet said it was highly unusual for a dog his age to begin having seizures. The dog is having seizures more frequently now which is a huge strain on his mental and his physical state. This is just one more case of animals adversely affected by Industrial Wind Turbines.

j. Revealed Preference case is information about individuals regarding the casual relationship and the intensity of costs inflicted upon them. Many people report expending substantial resources retrofitting their houses to reduce noise, selling their property at a loss, or abandoning their homes without being able to sell them.

The Dave and Rosemary Enz family is an excellent example of a family that has left their home and live out of a trailer in an effort to avoid the health problems at their home. There also is the issue of added cost to live in the trailer instead of their house which they have been doing for around 4 of DePere years now.

k. Revealed Preference case:

Darren and Sarah Ashley lived at 3820 Schmidt Road when the wind turbines started up and their illnesses started. To avoid health problems the Ashley's moved into a camper 12 miles away from the wind turbines. They lived in the camper for 100 days. Later the Ashley's purchased a second home and thus had to pay for two mortgages. The home they abandoned was a 5 bedroom 2 ½ bath home for six people to a much smaller two bedroom home with one bath.

l. Revealed Preference case:

Darrel and Sarah Cappelle lived at 5792 Glenmore road when the wind turbines and when the illnesses started. The moved out of that home and rented a home to get away from the illnesses. This home was a $200,000 home so they looked for a buyer but the only buyer they could find offered around $136,000 a $64,000 potential loss for the Cappelle's. The loan which was a FHA loan was denied by FHA because the home was near the Shirley Wind Turbines.

11. Wind Farm Developers That Settled With Injured Residents

a. Macarthur Wind Farm located in Victoria Australia

This project was installed by AGL which consist of 140 wind turbines that are each 3.0 MW (very large units) for a total capacity of 420 MW. It is the largest wind farm in the Southern Hemisphere. A survey of impacts of the Macarthur wind energy facility was conducted on 37 homes. The aim of the survey was to establish how many people are impacted by the noise, shadow flicker and television and radio interference. There were 23 households that were affected (66 %) and a total of 62 people (74%) were affected and 22 people were not. Of The 23 household affected 21 households (91%) reported changes to their health. A number of residents were bought out by the wind developer but these families had to sign agreements containing confidentiality clauses which is a common practice through out the world. Some homes were bulldozed and some were left unoccupied. The law firm Slater & Gordon the legal firm acting for the residents publicly confirmed this practice of using confidentiality clauses.

b. Joe Yunk located at N2630 Townhall Road Kewaunee Wisconsin. Joe Yunk had a farm at this address at the time that the Utlity WPS started construction on the Wind Farm in 1998 which consisted of 14 wind turbines called the Lincoln Wind Energy Facility with a Project Capacity of 9.24 MW or 0.66 MW each. The electrical output of this project was around 18,000,000 kwh /year (18,000,000 kwh/yr = 8760 hr/yr x 660 kwh/hr x 14 units x 0.2471 C.F.). When the wind turbines started up in the summer of 2000 Joe began to have health problems that he did not have before their start-up. He experience disturbing noise, shadow flicker, problems sleeping, stomach problems and a feeling of uneasy and irritability. At the stat-up of the wind turbines Tom had beef cattle

on his farm and he never lost any cattle before the wind turbines. After the wind turbines started up Tom began to loose cattle, he lost 10 animals over a two year period valued at $5000. He reported his illnesses to WPS but nothing was done. Within a year of start-up two families homes were purchased by WPS and those homes were demolished with bulldozers. At the time WPS was settling nuisance suits other neighbors his neighbor were offered buyouts way below market value however Tom never got any buyout offers from WPS. So Tom decided to sue WPS for the fair market value of his house. So he retained an attorney and filed suit with WPS and got WPS to buy his home.

c. Rodney Kok and his wife Sandra who lived at W1960 Longview Drive Cambria Wis.. Became ill as soon as the WE Energy's Glacier Hills Wind Park started up in 2011. This wind farm is made up of 90 turbines, each 1.8 MW in size (Vestas V90 units) The Kok home which is in the town of Cambria Wisconsin was purchased by the Utility WE Energies. This family also had chickens which stopped hatching eggs when the wind turbines started up. Rodney. This home is no longer occupied. They also had shadow flicker problems that lasted for over 280 hours/yr when they were told not to expect more than 10 to 15 hours/yr.

d. Dave Regnarus family home at N8274 County Road Cambria, Wisconsin
This family became ill as soon as the WE Energy's Glacier Hills Wind Park started up in 2011. This wind farm is made up of 90 wind turbines, each 1.8 MW in size (Vestas V90 units). The Regnarus home was purchased by WE Energy and that home has been torn down.

e. Al Smits family home at N8103 East Friesland Road Randolph, Wis.
This family became ill as soon as the WE Energy's Glacier Hills Wind Park started up in 2011. This wind farm is made up of 90 wind turbines, each 1.8 MW in size (Vestas V90 units). The Smit's home was purchased by WE Energy and this home Is no longer occupied.

f. Six former wind turbine hosts in Ontario Canada became ill when the wind turbines started up on their land near their home. The wind turbine developer bought the homes and land from these 6 families. These families had to sign gag orders preventing them from talking about their illnesses and their settlement. The family of Shawn and Trisha Drennans who later bought a home in that region and got sick from these wind turbines. Currently they are trying to get an Ontraio court to lift the gag order so that these families could speak about their illnesses when they lived on these properties

Note: On January 20, 2015 UWGB Professor Patricia Terry spoke that night to The Brown County Health Department. On that night she said that Wind Turbine Syndrome in the United States is mainly the Green Eyed Monster of Jealousy when your neighbor is making money and you are not. From my above cases you can clearly see that this is not the case for these people.

g. Suncor Energy & Acciona Energy Wind Farm called the Ripley Wind Power Project located in Ripley Ontario Canada. The project has 38 turbines that are 2.0 MW Enercon E82 Turbines.Listed below are some of the homes that had adverse health and annoyance problems. Of the 14 homes listed below, five homes so far have been bought by Suncor & Acciona. Owners of the homes bought by the developers had to sign gag orders if they wanted their homes purchased (by the developers) at fair market value:

(1) Property #1 was a beef farm with 400 head of cattle. The owner left the home and shut down his farm. This home was bought by Suncor?Acciona.

(2) Property #2 was a farm house and barn, he was the son of the Property #1 owner. This home was purchased by Suncor/Acciona. This house and barn was bulldozed by the developer.

(3) Property #3. This property and barn was leased by the Property #1 owner. It now is vacant. Was not purchased by the developers.

(4) Property #4 was owned by a Horse Trainer. The owner had problems with his horses related to the noise & shawdow flicker. This house also had electrical problems.This house was sold to Suncor/Acciona.

(5) Property #5 Family became ill and moved their farm to Manitoba. This home Was not purchased by the developers and is still up for sale.

(6) Property #6 owner (a farmer) had health problems and electrical pollution problems. A cash crop farmer purchased the land, the house was separated from the farm but is still on the market.

(7) Property #7 owned by horse trainer.This house had bad noise levels in the master bedroom at 74 dBA. The house also had electrical problems and the horses were bothered by shadow flicker and noise. This house was bought by Suncor/Acciona.

(8) Property #8 This home is a rental that was occupied by a family that left due to health problems from the wind turbines and thus left. This home is now unoccupied. This house was not purchased by the developers.

(9) Property #9 This house was exposed to noise levels over 40 dBA from the substation 1000 meters to the south. This house was purchased by Suncor/ Acciona and is stll vacant today.

(10) Property #10 has a owner that is reporting health problems and electrical contamination problems. Resolution is still to be determined.

(11) Property #11 & Property #12 are owned by the same owner. The owners are experiencing health problems. Preliminary testing shows electrical contamination.

(13) Property #13 This property owner is a host to some of the wind turbines. This family (which includes a sick daughter) is experiencing health problems but refuses to take action due to the restrictive clauses in the turbine leases.

(14) Property #14 This property owner is a host to some wind turbines. Problems with excessive infrasound are reported when winds are from the southeast. When this family becomes ill they stay in their second home in Paisley.

12. European Countries Have Written Noise Codes To Protect Residents From Problems from Industrial Wind Turbines and Other Devices.

The European countries of Poland, Germany, the Netherlands, Denmark and Sweden have written low frequency and infrasound noise codes to protect the public. To my knowledge there is no such code anywhere in the USA but acousticians like Richard James believe that a noise code could be written that would protect the public from this type of noise from Industrial Wind Turbines, Cooling Towers, Large Fans amd Boiler Systems.

13. Sick Building Syndrome – Per Acoustical Engineer Richard James

Modulated rumble low frequency noise produced by large fans has been one of the most frequently reported causes of adverse health effects. In the early 1960's a British acoustician observed that workers in a high rise office building sometimes reported symptoms similar to the wind turbine illnesses while at work. This effect was initially called Building Sickness Syndrome but was later changed to Sick Building Syndrome. The problem was so severe in some office buildings that workers refused to work in the office spaces and their employer's often used the situation to break long term leases with building owners. This led to a study in the U.S. by the American Society of Heating, Refrigeration and Air Conditioning Engineers (ASHRAE) to identify the cause and corrections. The study spanned over 20 years culminating in a research project by Dr Leventhall.

The study found that the cause of the symptoms was the large fans used for ventilation being improperly installed or having a defect in the drive train that caused a jerk in the rotation of the fan. The jerk caused the low frequency sounds to fluctuate rapidly. In buildings that had these design defects the worker/tenant complains, correction of the fans to eliminate all modulation made the work space useable again. The design criteria for HVAC systems supplying ventilation air to large office spaces are published in the ASHRAE Guide, a handbook for HVAC engineers. It was updated after the study found the cause and correction actions to include a procedure for assessing whether a building

is likely to cause sick building syndrome so that it can be corrected during the construction phase. It is worth noting that many of the workers who found the situation unbearable could not hear the rumble from the fans.

14. Since 1973 The United States Government Has Sponsored A Research & Development Program In Wind Energy In Order To Make Wind Turbines A Viable Technology.

Dr. Neil Kelly and his co researchers at the Solar Energy Research Institute (SERI) and the NASA Lewis Research Center under the sponsorship of the Dept. of Energy developed Utility Sized Wind Turbines before there was a utility sized wind turbine market.Their research strarted in 1975 and ended in 1996.This group developed built and tested a 0.10 MW unit 1975 to 1982), a 0.20 MW unit (1977 to 1984), a 2.0 MW unit (1979 to 1981), a 2.5 MW unit (1982 to 1988), a 4.0 MW unit (1982 to 1994), a 3.2 MW unit (1987 to 1996) and a 7.3 MW unit that was not built. In 1985 Dr. Kelley revealed a source of annoyance for residents living near a single downwind bladed wind turbine was producing impulsive infrasound and low frequency noise which resonated within building structures. Their research was detailed, thorough, and conducted in the best scientific fashion- curiosity about unintended consequences or annoyance being reported by residents. They wanted to find out what was causing the reported problems, in order to prevent them occurring in the future. The 2.0 MW Wind Turbine on start-up resulted in a dozen families with complaints within a 3 km (1.86 miles) radius of the turbine.

This research document was published in February 1985 based on analysis of the MOD-1 wind turbine which was a 2.0 MW unit. This report is a very detailed 262 page report. It should be pointed out that the 0.10 Mw, 0.20 MW the 2.0 MW and the 4.0 MW units were all downwind wind turbines. The 2.5 MW the 3.2 MW and the 7.3 MW units were all upwind wind turbines. In November of 1987 Dr. Neil Kelley released a report called "A Proposed Metric for Assessing the Potential Annoyance from Wind Turbine Low-Frequency Noise Emissions".

The effects were consistently reported to be worst in small rooms facing the noise source. Sensitization or conditioning was acknowledged - in simple terms people did not habituate or get used to the sound energy but became more sensitized to it with cumulative exposure. What was clearly established was that perception of the sound energy was well below the audibility thresholds for hearing in the infrasound range. This is a critically important point, because all too often it is asserted particularly by those with vested interest that it is the audibility thresholds which are the thresholds to consider, not the much lower infrasound perception thresholds. In other words people could feel the sound pressure or vibration and were disturbed by it at levels at levels where they could not hear. This is precisely what people living near wind turbines describe – that they can feel the pulsations or vibrations even when they cannot hear the turbines.

Subsequent laboratory experiments using volunteers working for SERI (rather than

wind turbine noise sensitized residents) reproduced the sound energy and the variable effects on those exposed. In other words direct causation of the reported annoyance effects from the impulsive reproduced sound energy identical to wind turbine noise was clearly established. This research was certainly noticed because it led to immediate changes in design from downwind bladed turbines to upwind bladed turbines, specifically to reduce or eliminate this problem of annoyance to the neighbors. However the safety thresholds for infrasound and low frequency noise exposure levels, established by Kelly in 1985 on the basis of their detailed field study and subsequent laboratory data, were not ever adopted in the noise guidelines for wind turbine noise. This research was presented at the American Energy Association Windpower conference in 1987, sponsored by the US Department of Energy.

It was initially thought that the new upwind bladed horizontal axis wind turbines did not generate high levels of infrasound and low frequency noise. NASA research

published by Shepherd and Hubbard in 1989 established that there was turbulent air feeding into the upwind turbines that could generate surprisingly high levels of infrasound and low frequency noise. This might explain why NASA went onto develop a 4.0 MW downwind wind turbine.

It is very clear from these documents that there is a direct casul link between impulsive Infrasound and Low Frequency Noise and annoyance symptoms which is still denied by the wind industry.

15. British Medical Journal Acknowledges Health Impacts of Wind Farms. The title of this document is "Wind Turbine Noise Seems to Affect Health Adversely and an Independent Review of Evidence is Needed". March 2012. Authors Dr.Christopher D Hanning and Professor Alun Evans.

This is an excerpt from the BMJ article:

"Seems to affect health adversely and an independent review of evidence is needed. The evidence for adequate sleep as a prerequisite for human health, particularly child health, is overwhelming. Governments have recently paid much attention to the effects of environmental noise on sleep duration and quality, and how to reduce such noise. However, governments have imposed noise from industrial wind turbines on large swathes of peaceful countryside. The impact of road, rail, and aircraft noise on sleep and daytime functioning (sleepiness and cognitive function) is well established. Shortly after wind turbines began to be erected close to housing, complaints emerged of adverse effects on health. Sleep disturbance was the main complaint. Such reports have been dismissed as being subjective and anecdotal, but experts contend that the quality, consistency, and ubiquity of the complaints constitute epidemiological evidence of a strong link between wind turbine noise, ill health and disruption of sleep".

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His expertise in this field has been accepted by the civil, criminal and family courts. He chairs the Advisory panel of the SOMNIAstudy, a major project investigating sleep quality in the elderly, and sits on Advisory panels for several companies with interests in sleep medicine..Alun Evans, is an epidemiologist, Centre for Public Health, Queen's University of Belfast, Institute of Clinical Science B, Belfast, UK, who has been leading the fight in Ireland against industrial wind turbines being located near dwellings because of the adverse health effects on their inhabitants.

16. People Who Have Gone Through Considerable Medical Analysis To Understand Their Health Problems, That Started When The Wind Turbines Started Up. Theses Health Studies of Their Symptoms Did Not Find Any Explanation To The Symptoms Other Than the Pressure Pulsations from the Turbines. In Some of Theses Cases the Doctors Did Believe That The Problem Was The Wind Turbines and in the Other Cases the Doctors Could Not Explain the Cause of the Symptoms Based on Their Tests Conducted In Their Offices Away From The Wind Turbines.

a. Joan Lagerman of Malone became ill from the We Energies Blue Sky Green Fields Wind Energy Center as soon as it started up. In a effort to understand and relieve her symptoms she has seen her doctor, has gone through sleep studies and has seen a neurologist who has eliminated many possible causes including exposure to heavy metals. Joan's doctor does believe that the wind turbines are the cause of her health problems in fact her doctor contacted the Fond du lac Health Department about her concerns and she is a board member.

b. Michelle Buresh and Jerry Buresh are ill from the wind turbines in Shirley Wind. Michelle wanted to understand why she was ill so she saw doctors to find cures to her symptoms. She had hearing tests, MRI's, Basic Vestibular Evaluation, physical therapy, Blood Work for disease, deficiencies, pet hormone Test, Sinus CT Scan, Gastrointestinal Analysis, Opthamologist (focusing on the eyes), Review by 2 Neurologists, Review by her General Practioner, Vestibular Weakness Analysis, Review by an ENT Doctor, and a Naturopathic Nurse Practitioner who reviewed food allergies. In Michelle's case they could not find anything wrong with her that would explain her symptoms. Of course later she realized that the symptoms would stop when she was away from the wind turbines

17. People Who Have Hosted Wind Turbine Installations On Their Land, Have Become Sick From The Wind Turbines.

a. Allen Hass is a farmer who owns 600 acres in Malone Wisconsin. Allen hosted

three We Energies Blue Sky Green Fields wind turbines on his land which pays him around $12,000 a year for the space. Upon start-up Allen started getting symptoms which include headaches and memory loss. His statement to the press include"The money does not make up for his health problems" and "I wish I never made that deal".

b. Dick Koltz who lives in Brown County signed a contract with Invenergy to host a wind turbine on his land. He has experienced illness from wind turbines in Fond du lac County before the wind turbine was installed on his land. He then tried to get out of his contract but could not.

c. David and Alidia Millicent hosted wind turbines on their land in South Australia who became ill when the wind turbines started up.

d. Clive and Trina Glare are cattle farmers who hosted 19 wind turbines on their land near Hallett Australia. The wind farm is called the Hallett Wind Farm comprised of Suzlow S88 Turbines that are 2.1 MW units. This installation has 167 wind turbines for a total capacity of 350.70 MW. The Glare family agreed to lease their land for 19 turbines for $20,000/yr or $4,000,000 over the expected 20 year life. On Tuesday October 6, 2015 the Glares spoke to the Senate Select Committee on Wind Turbines in Australia (Senate Inquiry) about their lack of sleep and illnesses. The Committee asked Clive "If you had your time over again, would your host a wind Farm?" Clive replied " "No absolutely not". The wind farm developer paid for noise reduction windows and insulation to reduce the negative health effects which did not work.

18. List of Symptoms –Document from the Waubra Foundation

- About
- Health Effects
- Information
- Resources
- News
- Contact us

List of Symptoms

This section gives a detailed framework to assist with understanding the range and the pattern of symptoms being described by residents, workers and visitors.

People are affected by infrasound and low frequency noise (ILFN) and vibration from a wide variety of sources in both residential and occupational settings. Sources of ILFN reported to the Waubra Foundation include wind turbines, coal seam gas field compressors, coal mining activities, gas fired power stations. Some acousticians also report being affected whilst conducting attended measurements.

Residents can get started with a more simple summary

If you're new to the topic or looking for a less technical List of Symptoms, please get started with the Information for Residents..

What is the pattern of symptoms?

For those affected, there is a clear and consistent correlation between exposure to the environmental noise and the development of characteristic symptoms. Not everyone is affected, although over time, more and more people report developing sleep disturbance or other symptoms.

The onset of symptoms is variable, even within families where individuals have identical exposures. Many farming or rural families have one or more members 'off farm' for long periods of time, especially during the day, for education or employment activities, meaning there will generally be very different exposures during the day.

Individual differences in susceptibility also play a role. A small subgroup of people with a history of migraine, inner ear pathology or motion sickness describe being affected from the first few days of exposure, with nausea and vertigo in the case of wind turbine noise, but the vast majority of affected residents are not affected in this way.

For most residents, the changes appear incremental over months or years. Many people describe not realising how they are being affected until either the source of the noise ceases for a period of time (rare) or they go away and start to notice the symptoms dissipate or vanish completely. Often people describe this happening repetitively, before they are sure their symptoms are related to the environmental noise.

For those rural residents who never get away, they often attribute it to 'getting older', 'menopause' or some other factor, until they start talking with neighbours and others with similar experiences, and realise that there may be other reasons for their symptoms.

Turbine hosts get symptoms too

David Mortimer, a wind turbine host from South Australia, has publicly described a number of occasions how he just thought he was 'getting older', until he heard another resident from Cape Bridgewater speaking about his own symptoms, which were identical to those David had experienced for some years.

David describes being affected by the turbines much earlier than his wife. Once David made that connection between the symptoms and exposure to operating wind turbines, David and his wife then tried periods of time away from their home and kept track of what their symptoms and sleep patterns were like. They found their symptoms correlated directly with exposure to operating wind turbines.

The symptoms disappear when the Mortimers are nowhere near industrial wind turbines, but David and his wife have now become so sensitised that they can detect the unwelcome pulsating sensations particularly at night, out to 17 km from the nearest operating wind turbine.

This distressing perception of inaudible sound energy out to distances well beyond 10km has also been reported by residents who are sensitised both in Australia and internationally in the UK, France and the USA, particularly in areas with quiet background noise.

What is the most common symptom?

Recurrent sleep disturbance or waking up tired is the most commonly reported problem.

What are the acute symptoms?

Vestibular dysfunction/disorders or "wind turbine syndrome" symptoms

(see also Dr. Owen Black, and Dr Nina Pierpont's executive summary and report for clinicians submitted to the Federal Senate Inquiry)

- Sleep disturbance
- Headache, including migraines
- Tinnitus
- Ear pressure (often described as painful)
- Balance problems / dizziness
- Vertigo
- Nausea
- Visual blurring
- Irritability
- Problems with concentration and memory
- Panic episodes
- Tachycardia (fast heart rate)

Acute Sympathetic Nervous System 'fight flight' Symptoms & Problems

- Tachycardia (fast heart rate)
- Arrythmias, which residents might describe as palpitations
- Hypertension (high blood pressure) which has been reported by some residents to be considered unstable by their treating doctor or cardiologist, and to vary in response to exposure to operating wind turbines.

Related rare but serious conditions

The following three conditions are rare, but important to mention because they are potentially life threatening, and have been identified in Australia, Canada and Germany to correlate with wind turbine operation.

- **Tako Tsubo heart attack** — these are not the classic heart attack, involving acute blockage of a major artery to the heart muscle, rather they are caused by adrenaline surges which cause constriction of the little blood vessels called capillaries directly supplying the heart muscle
- **Acute hypertensive crisis (Australia, Ontario)** - sudden onset of dangerously high blood pressure, often accompanied by severe headache, nausea, sensation of their heart 'leaping out of their chest'. The usual cause for these symptoms and this diagnosis caused by adrenaline surges would be an underlying adrenal tumour, called a phaeochromocytoma. However in the residents reporting this problem, that diagnosis of an adrenal tumour was specifically excluded by subsequent medical investigations
- **Crescendo angina** — i.e. worsening severe cardiac ischemic chest pain which was previously successfully relieved with anginine spray, when not exposed to operating wind turbines. The best clinical description of this came from a couple in Germany highly

sensitised to ILFN after 18 years of exposure, who were stuck in a vehicle on an

autobahn near large industrial wind turbines. The same phenomena has been reported in Australia by a resident subsequently advised verbally by his cardiologist never to go back home to Waterloo

Other characteristic symptoms (some have a chronic exposure component but manifest with acute symptoms)

- Episodes of sensation of body vibration (specifically lips, chest cavity and abdomen)
- Episodes of intense anger (reported in workers as well as residents, also noted to a much lesser extent with short exposure to infrasound and low frequency noise (ILFN) in Professor Leventhall's experimental research in an office occupational setting in 1997)
- Bleeding from ear drum following intense and painful sensation of ear pressure, in the absence of trauma or previous symptoms
- Deteriorating hearing (confirmed sometimes with audiological assessment)
- Menstrual irregularities in women marked by heavy bleeding and noticeable hormonal cycle changes
- Significantly decreased ability to "multi task" impacting noticeably on resident's ability to perform usual tasks
- Noticeable difficulties with mental arithmetic, when previously able to calculate easily
- Hyperacusis – extreme sensitivity to "normal" sounds which in some circumstances has persisted for over 6 years after removal from the exposure to ILFN
- Disorders of thyroid metabolism which stabilize when away from ILFN
    - Disorders of diabetes control which stabilize when not exposed from ILFN
- Disorders of blood pressure control, which stabilise when not exposed to ILFN
- Migraines and severe headaches described by sufferers as "like a vice around the head"
- Episodes of perceiving that their heart beat is trying to "get in sync" with the blade pass of the turbines, which some people describe as being like an arrythmia but others do not. It is universally described as unpleasant

Chronic symptoms

Sleep disturbance & its consequences

Sleep disturbance itself has been attributed by residents to the following, which they report does NOT happen when they are not exposed to operating wind turbines, and correlates with wind direction and weather conditions on the nights when they are affected in this way:

- Audible noise of the turbines (especially if their home is not well insulated, or the windows are open, and they live close to the turbines)
- Waking at night in the characteristic 'panicked' state (many residents living far from turbines report this symptom despite not being able to see or hear the turbines when they awake)
- Violent and disturbing dreams in adults and children, which can happen repeatedly over the same night. In the case of children, they can be extremely distressed and difficult to console
- Increased need to urinate, sometimes as often as every 10 minutes for a period of up to one hour (sometimes this affects numerous people in the house at once)
- Bedwetting in children reported by parents to have been previously dry at night for some years

Known clinical consequences of repetitive sleep disturbance/deprivation

The adverse health consequences of insufficient sleep have been well known to clinical medicine for decades, and are increasingly being reflected in the peer reviewed published literature. They include the following:

- Cardiovascular disorders (including hypertension) ischemic heart disease, angina
- Diabetes
- Mental health disorders such as depression and anxiety, and increased suicide risk
- Impaired immunity, leading to increased acute and chronic infections, and in the longer term malignancies (cancers)
- Fatigue-related work impairment and accidents. This is a serious issue for rural communities and farms, where workplace injury is already a significant problem
- Fatigue driving heavy vehicles and school buses (a safety concern for the entire rural community)
- Fatigue in workers such as health care workers (Australia), air traffic controllers (USA), well known to lead to impaired judgment which will detrimentally impact on the safety of the wider community, in addition to personal health problems for those individuals

Chronic stress (Psychological & Physiological) & its consequences

Illnesses either caused or exacerbated by chronic stress have been well documented in published peer reviewed research literature for many years, and are being reported by these residents. Some overlap with those listed above for sleep disturbance, which is itself a source of stress. They include the following:

- Cardiovascular disorders (including hypertension), ischemic heart disease, angina, and transient ischemic attacks (precursors of strokes)
- Diabetes
- Mental health disorders such as depression and anxiety, often severe (suicidal ideation)
- Impaired immunity, (elevated cortisol being one component) leading to increased acute and chronic infections, delayed healing, and in the longer term to malignancies (cancers)
- Disrupted human fertility and hormonal cycles
- Exacerbation of pre-existing inflammatory disorders, including arthritis, asthma, inflammatory bowel disease, SLE (Lupus), or the development of new inflammatory conditions which coincide with exposure to ILFN & vibration

Is there a link between ILFN and Post Traumatic Stress Disorder (PTSD)?

Repetitive physiological stress events as well as a once off major acutely stressful event like a fire or a flood or a major accident have both been linked with subsequent development of PTSD.

There are residents living near ILFN sources who have reported that symptoms of their pre-existing PTSD (resulting from Vietnam War experiences or childhood sexual abuse) are triggered with exposure to operating wind turbines. Other residents with a history of PTSD have reported feeling the symptoms of a panic attack coming on when driving past operating turbines (these individuals were unaware of any possible connection between ILFN and anxiety symptoms, and were strong supporters of wind turbines at the time).

Helicopter noise, and blast noise and vibration from mining have also been reported by other clinicians as triggers for recurrence of PTSD symptoms in their patients. All these are also known sources of ILFN & vibration, as well as sources of sudden impulsive noise.

There are also reports of people who develop PTSD **after** exposure to operating wind turbines, having no previous psychiatric problems. One former resident at a wind development has ongoing problems with residual PTSD seven years after they moved away, having been bought out and silenced by the wind developer.

Stress and dental disease

Stress is an acknowledged long term contributor to dental disease via a number of mechanisms including impaired immunity and a dry mouth from repetitive physiological stress episodes. Increased severity of dental infections has certainly been reported by some residents living near turbines who report this as one of a number of health problems.

Tissue damage

The conditions below have been reported from Germany in residents exposed to operating wind turbines for over 10 years.

- Pericardial thickening
- Mitral and tricuspid valve thickening
- Characteristic mouth ulcers described in Vibroacoustic disease

The cardiac tissue pathology is identical to that described in workers and others studied by the Portuguese researchers who first described vibroacoustic disease (VAD), now being diagnosed in others including most recently in Taiwanese aviation workers.

The occurrence of symptoms correlating with ILFN exposure

All of the above problems listed have the characteristic pattern of improving partially or completely when the turbines are off, or when the residents are away from their homes or source of other ILFN.

Some residents also report subsequently being affected by other sources of ILFN, such as when flying in some aeroplanes, or when exposed to LFN from heating and cooling (air conditioning) compressors, or travelling in some motor vehicles. This is not unknown to acousticians, and is evidence of that individual's sensitisation to ILFN, described byProfessor Leventhall in 2003. The only known solutions are either removal of the source of the ILFN, or relocating away from it.

What happens with ongoing exposure? Do people "get used to it"?

What is being consistently observed is that the symptoms progress, and the mental and physical health of many sick people deteriorates with ongoing exposure to ILFN, if they cannot move away.

This pattern of deterioration was well described in the scientific literature relating to chronic

stress by Bruce McEwen in 1998, in an important review article in the New England Journal of Medicine. (**McEwen, Bruce** "Protective and Damaging Effects of Stress Mediators" New England Journal of Medicine 1998, 338 171–179)

There is no clinical or experimental evidence that people "get used to" the sound energy in low frequencies, especially once they are "sensitised".

18. Can Expectations Produce Symptoms From Low Frequency Noise & Infrasound Associated With Wind Turbines?

First, most of the individuals who have reported adverse health effects from wind turbine noise, some of whom have abandoned their homes, are not people who were adequately warned of potential health effects prior to their exposure. In fact, many individuals who report adverse health effects were advocates of wind energy prior to being exposed. This is the case of many people in the Shirley Wind Project area and other wind turbine projects in Wisconsin. Some of these people who became ill did not understand why they were ill and thus saw many doctors to understand why they had symptoms making them ill. Two examples are Joan Lagerman and Michelle Buresh.

Also how do you explain all of the negative health impacts we have seen on animals like the mink farm in Australia, or the death of cattle, or the chickens that either stopped laying eggs or laid eggs with thin shells. So it is easy to disprove that theory that the symptoms are psychosomatic.

There are many cases in Wisconsin and throughout the USA where the people supported wind turbine projects until they started up and the people got sick. One excellent example is the wind project called the Fox Islands Wind Project in Vinalhaven Maine that was installed by Fox Islands Electric Cooperative which is a utility cooperative that provides electricity for the residents of Penobscot Bay Islands, North Haven and Vinalhaven. Vinalhaven is the home to the Fox Islands Wind Project that is three 1.5 MW industrial wind turbines. In July 2008 ratepayers voted 382 to 5 (98.71 % Voting for the project) to authorize the FIEC Board to Directors to proceed with developing plans to erect three wind turbines on a site located on the interior of Vinalhaven. In the first 10 minutes of operation around 20 households in Vinalhaven began to complain about the noise, pressure pulsations and later lack of sleep and health problems. So one cannot say that these people were having a psychosomatic symptoms. There are 32 adults that live within 1500 meters (0.93 miles) of the three wind turbines.

Perhaps the most compelling argument proving that the wind turbine did not cause Psychosomatic (Nocebo Effect) health symptoms is NASA's first utility sized wind turbine project caused health illnesses to the residents living near that wind turbine. These people did not experience psychosomatic health symptoms because they did not know about health problems from industrial wind turbines. So this is not a nocebo effect

or anxiety generated by heightened awareness of industrial wind turbines. The health symptoms are documented in NASA Reports by Dr.Neil Kelley.

19. Epidemiological Study of Health Effects of Persons Living Within 1100 meters Of the Mars Hill Wind Turbine Project. This project has 28 wind turbines that are 1.5 MW in size. Study by Dr. Michael M. Nissenbaum.

	Subject Group	Control Group
a. Group Size	**22 Adults of 30 Adults (73.33 % Participation)**	**27 Adults**
b. Distance From Turbines	**1100 meter 3608.93 feet 0.6835 miles**	**5000 meters 16,404.23 feet 3.1069 miles**
c. Reported a new onset of worsened sleep disturbance	**18 Adults (82%)**	**1 Adult (4 %)**
d. Sleep disturbance included waking up in the middle of the night	**17 adults (77 %)**	
	Subject Group	**Control Group**
e. Increased headaches since start-up.	**9 Adults (41 %)**	**1 Adult (4%)**
f. Increased migraine frequency	**2 Adults (9 %)**	
g. New or worsened problems with dizziness	**3 Adults (14 %)**	**0 Adults (0 %) No auditory or vestibular complaints**
h. Reported Tinnitus	**3 Adults (14 %)**	**0 Adults (0 %)**
i. Reported a new problem with ear pulsations	**3 Adults (14 %)**	**0 Adults (0 %)**
j. Reported periodic ear pain	**1 Adult (5 %)**	**0 Adults (0 %)**
k. Troubled by shadow flicker	**7 Adults (32 %)**	**0 Adults (0%)**

l. Nausea	**2 Adults (9 %)**	**0 Adults (0 %)**
m. Dizziness	**4 Adults (18 %)**	**0 Adults (0 %)**
n. Triggering migraine headaches by shadow flicker	**1 Adult (5 %)**	**0 Adults (0 %)**
o. A feeling of unease created by shadow flicker	**2 Adults (9 %)**	**0 Adults (0 %)**
p. Unintentional weight changes	**8 Adults (36 %)**	**1 Adult (4 %)**
q. New or worsened psychiatric symptomatology, including feelings of stress	**13 Adults (59 %)**	**0 Adults (0 %)**
r. Anger	**17 Adults (77 %)**	**0 Adults (0 %)**
s. Anxiety	**7 Adults (32 %)**	**0 Adults (0 %)**
t. Irritability	**6 Adults (27 %)**	**0 Adults (0 %)**
u. Hopelessness	**12 Adults (55 %)**	**0 Adults (0 %)**
v. Depression	**10 Adults (45 %)**	**0 Adults (0 %)**
w. New or increased prescriptions for psychiatric medication	**4 Adults (18 %)**	**0 Adults (0 %)**
x. Considered moving away	**22 Adults (100 %)**	**0 Adults (0 %)**
y. Reported that their quality of life has been negatively affected by the Mars Hill Wind Turbine Project	**21 Adults (95 %)**	**0 Adults (0 %)**
z. Reported new and increased prescriptions for various health ailments since Project start up o Dec. 2006	**15** **Cymbaalta** **Mirtazepine** **Trazodone** **Hydrocodone** **Topamax** **Anxiolytics: 2** **BP Meds: 3** **Lexapro** **Zoloft** **Meloxicam** **Tylenol III**	**4** **Antihypertensives: 3** **Antiarthritic :1**

Comment By Dr. Nissenbaum: It is my professional opinion that there is a high probability of significant adverse health effects for those whose residence is located within 1100 meters of a 1.5 MW turbine installation based upon the experiences of subject group of individuals living in Mars Hill, Maine. One hundred percent of the persons he interviewed reported that they considered moving away, but none of the Control Group admitted to considering moving away during that time.

Later Dr. Michael Nissenbaum, Jeffery Aramini and Christopher Hanning published a epidemiological study document called: "Effects of Industrial Wind Turbine Noise on Sleep and Health", in Noise & Health September 2012. This study is an investigation of two sites: Mars Hill and Vinalhaven, Maine.The Vinalhaven Project is three 1.5 MW wind turbines. This study came to similar conclusions to the above study.The Conclusion for this study is: We conclude that the noise emissions of Industrial Wind turbines disturbed the sleep and caused daytime sleepiness and Impaired mental health in residents living within 1400 meters of the two IWT installations studied.industrial wind turbine noise is a further source of environmental noise, with potential to harm human health. Current regulations seem to be insufficient to adequately protect the human population living close to IWT's. Our research suggests that adverse effects are observed at distances even beyond 1 km. Further research is needed to determine at what distances risks become negligible, as well as to better estimate the portion of the population suffering from adverse effects at a given distance".

20. Falmouth Massachusetts Study- "Wind Turbine Acoustic Investigation: Infrasound And Low-Frequency Noise- A Case Study". Authors are Stephen E. Ambrose, Robert W. Rand, and Carmen M.E. Krough. This is a SAGE Document on September 11, 2012.

In this study, they compared measured sound levels to time-synced observations of changes in health symptoms while the authors (observers) –who were the investigators themselves-were not aware when the turbine blades were rotating or not rotating. A video recorder that faced the turbines and an audio recorder placed outside the home were used to document the sounds using quantitative and qualitative measurements that were time-synced to the observations of health effects. Using a time-history analysis, the investigators experienced a large number of negative health symptoms, which are given in their Table 2, and those symptoms were closely time-synced to the start-and-stop operations of the wind turbines. This is compareable to a single-subject research design, and it provides good evidence that wind turbine noise is related to adverse effects.

For total unweighted sound exposure, the investigatos were exposed to dynamically modulated pressure pulsations every 1.4 seconds (Notus 1.65 MW Blade pass rate) at the study house (Figure 15). The pressure pulsations at Shirley wind were every 1.40 seconds per blade passage. After being indoors for 15 minutes, the pulsations

totaled 642 peak pressure events. Every hour there are 2570 pressure events. After completion of this study the team developed infrasound measurements at the Neil and Betsy Anderson home. This Figure 2 plots the Sound Pressure Level in dB verses the Frequency Hz of the sound. This diagram shows the pressure pulsations from peak to trough from 1 Hz and below through 10 Hz. The pressure pulsations shown are the first blade bypass followed by Harmonics of 1 x BPF, 2 x BPF(first harmonic) 3 x BPF, 4 x BPF, 5 x BPF, 6 x BPF, 7 x BPF and finally 8 x BPF. The peak to trough noise peaks out at around 14 dB (peak to trough), which is a ignificant pressure pulsation. According to acoustical engineer Richard James the majority of the acoustic energy is seen in the frequencies of 0.50 hz to 3.0 Hz. The absolute pressure level of the noise is not the issue or concern, it is the rate at which the pressure changes.Malcolm Swimbanks paper from the 2012 NY Noise Con is a good explanation of how amplitude modulation of wind turbine acoustic energy can result in symptoms even when the average pressure level is relative low. Salt's paper from the same conference shows how factors such as spectrum shape can also affect the SPL at which symptoms are reported. Richard's measurements show that the average levels at blade pass frequencies are generally 60 dB or higher at the BPF although some show SPL's of less than 60 when the home's occupants are also reporting adverse symptoms.

In my opinion most of the adverse health effects from industrial wind turbines is due the dynamically modulated pressure pulsations. In my opinion if we write a noise code that limits these peak to trough pulsations to 3dB (peak to trough) at the residential property line, the health symptoms due to this modulated noise should disappear. Some European Noise Codes use this guideline of 3 dB (peak to trough). The question is can the Brown County Health Dept. testers, test for this modulated Noise peak to trough values at Blade Bypass and its harmonics?

These codes will also need to limit shadow flicker and audible noise that can also cause annoyance and or health symptoms..

21. Self Reporting Surveys to Resident Living in the Waterloo Wind Farm in South Australia. This wind farm has 37 Vestas V90 industrial wind turbines that are 3.0 MW in size which started up in 2011. Upon start-up there were many negative sleep loss and health impact complaints from the residents and effects on livestock (most notably poultry).

a. Case #1 – Survey of households within 5 km (3.1069 miles)
   (1) Number of surveys sent out: 75
   (2) Number of surveys completed: 48 (64 % response rate)
   (3) 50 % of residents were moderately affected to very affected
   (4) 38 % had adverse health effects

b. Case #2 – Anonymous Self Reporting Survey of Households near a 10 km (6.2137 miles) zone of the Waterloo Farm. Conducted by Mary Morris.

(1) Number of Surveys to homes sent out: 230
(2) Number of Surveys by homes that were completed: 93 (40.43 %)
(3) Number of homes disturbed by impacts including noise, shadow flicker and problems with TV reception in the 10 km zone: 46 (49 %)
(4) Day time noise disturbance: 36 (39 %)
(5) Night time noise disturbance: 37 (40 %)
(a) Number with sleep disturbance: 27 (29 %)

Survey of people in a 5 km (3.1069 miles) -41 Households in this zone
(1) Day time noise disturbance: 23 (56 %)
(2) Night time noise disturbance: 23 (56 %)
(3) Experienced sleep disturbance: 16 (39 %)

22. Mrs. Anne Schafer has complied this preliminary survey report from data collected from an anonymous survey of residents living within 10 km (6.2137 miles) of the AGL Macarthur Wind Development in southwest Victoria. The first VESTAS V112, 3 MW Industrial wind turbines started operation in October 2012. A total of 130 wind Turbines were installed.

(1) 66 % of the responding households reported being adversely impacted
(2) 100 % reported night time adverse effects including sleep disturbance
(3) 91 % reported negative effects on the resident's health
(4) 46 % of the households lived between 2 km and 5 km from the nearest turbine

(5) 18 % lived between 5 km and 10 km from the nearest turbine
(6) The furthest household reporting adverse impacts live 8km to 9 km (4.97 mi to 5.59 mi)

23. Statement made by Epidemiologist Carl V. Phillips, PhD in his SAGE article "Properly Interpreting the Epidemiologic Evidence about the Health Effects of Industrial Wind Turbines on Nearby Residents ", August 2011.

Carl's Statement: "There is overwhelming evidence that wind turbines cause serious health problems in nearby residents, usually stress-disorder type diseases, at a nontrivial rate. The bulk of the evidence takes the form of thousands of adverse event reports. There is also a small amount of systematically-gathered data. The adverse event repots provide compelling evidence of the seriousness of the problems and the causation in this case because of their volume, the ease of observing exposure and outcome incidence, and case-crossover data. Proponents of turbines have sought to deny these problems by making a collection of contradictory claims including that evidence does not "count", the outcomes are not "real" diseases, the outcomes are the victims' own fault, and that acoustical models cannot explain why there are health problems so the problems must not exist. These claims appeared to have swayed many nonexpert observers, though they are easily debunked".

24. Carl V. Phillips testimony on June 30, 2010 in Madison Wisconsin to the Public Service Commission of Wisconsin.

Partial Statement: "So. I'm an epidemiologist and policy researcher. I'm specifically expert in how to optimally derive knowledge for decision making from epidemiological data. I have a PhD in public policy from Harvard University, and I did a post doctoral fellowship in public health policy and the philosophy of science. I've spent most of my career as a professor of public health and medicine, most recently at the University of Alberta and I currently direct an independent research institute. I reviewed the literature on health effects of wind turbines on local residents, including the reports that have been prepared by industry consultants and the references therein and I have reached the following conclusions which I present in detail in a written report that I believe will be submitted (to the commission). First there is ample evidence that some people suffer a collection of health problems including insomnia, anxiety, loss of concentration, general psychological distress as a result of being exposed to turbines near their home. The type of studies that have been done are not adequate to estimate what portion of the population is susceptible to the effect, the magnitude of the effect or exactly how much exposure is needed before the risks become substantial, but all of these could be determined with a fairly simple additional research. The best evidence we have which has been somewhat downplayed in previous discussion is what's known as case cross-over data, which is one of the most useful forms of epidemiological study, where both the exposure and the disease are transitory. That is, it's possible to remove the exposure and see if the disease goes away, and reinstate it and see if the disease reurs which is exactly the pattern that has been observed for some of the sufferers who have physically moved away and sometimes back again. With that study design in mind we actually have very substantial amounts of data in a structured form, contrary to some of the claims that have been made. And more data of this nature could easily be gathered if an effort was made. Moreover, people's avoidance behavior. They're moving from their homes and so forth, is a clear revealed preference measure of their suffering. Such evidence transforms something that might be dismissed as subjective experience or perhaps fakery to an objective observation that someone's health problems are worth more than the thousands of dollars they've lost trying to escape the exposure".

Carl V. Phillips submittal of a document to the Public Service Commission of Wisconsin on Docket No. 1-AC-231 which is document PSC REF#:134274. In this document Carl makes the following statement:

Epidemiology is the study of actual health outcomes in people, and thus is the only science that can directly inform us about actual health risks from real-world exposures. Related biological and physical sciences often provide useful information about health risks, but they are ultimately trumped by epidemiology because real-world exposures and the human body and mind are so complex that we cannot effectively predict and measure health effects except by studying people and their exposures directly.

There is ample scientific evidence to conclude that wind turbines cause serious health problems for some people living nearby. Some of the most compelling evidence in support of this has been somewhat overlooked in previous analysis, including that the existing evidence fits what is known as case-crossover study design, one of the most useful studies in epidemiology, and the revealed preference (observed behavior) data of people leaving their homes, etc., which provides objective measures of what would otherwise be subjective phenomena. In general this is an exposure-disease combination where causation can be inferred from a small number of less formal observations than is possible for cases such as chemical exposure and cancer risk.

In this document Carl also said:

In particular, my scientific analysis is based on the following points, which are expanded upon below:

1. Health effects from the turbine noise are biologically plausible based on What is known of the physics and from other exposures.

2. There is substantial evidence that suggests that some people exposed to wind turbines are suffering psychological distress and related harm from their exposure. These outcomes warrant the label “health effects” or “disease” by most accepted definitions, though arguments about this are merely a matter of semantics and cannot change the degree of harm suffered.

3. The various attempts to dismiss the evidence that supports point 2 appears to be based on a combination of misunderstanding of epidemiologic science and semantic games. Multiple components of this point appear below.

24. The World Health Organization in their 1999 Guidelines for Community Noise document made the following comment:

“It should be noted that a large proportion of low-frequency component in a noise may increase considerably the adverse effects on health”.

25. The Royal Society is an independent Scientific academy of the United Kingdom and the Commonwealth, dedicated to promoting excellence in science. The Royal Society Open Science is a peer-reviewed open access scientific journal published by the Royal Society which covers all scientific fields. In August 2014 the journal published a study called “Low-Frequency Sound Affects Active Micromechanics In the Human Ear” by Dr. Markus Drexl and his team at the University of Munich. Dr. Drexl is with the German Center for Vertigo and Balance Disorders and the Department of Otorhinlaryngology, Head and Neck Surgery.

Noise Induced hearing loss is one of the most common auditory pathologies, resulting

from overstimulation of the human cochlea, an exquisitely sensitive micromechanical device. The cochlear is a spiral shaped cavity which is essential for hearing and balance. Dr. Drexl showed in lab conditions that low frequency sounds (including infrasound) have a surprising strong effect on sensory cells in the inner ear. A total of 21 volunteers with normal hearing were exposed to 30-Hz tone for 90 seconds at a sound pressure level equivalent to 80 decibels. The researchers used a phenomenon referred to as spontaneous otoacoustic emissioms (SOAE's) to explore how the inner ear responded to the signal. SOAE's are scarcely perceptible acoustic signals that are produced by the inner ear and can be detected with a sensitive microphone inserted in the ear canal. Dr. Drexl said: It turns out that low-frequency sounds have a clearly definable modulatory influence on spontaneous otoacoustic emissions. After being exposed to a 30-Hz signal for 90 seconds, the subjects' SOARs exhibited slow oscillations in frequency and level, which persisted for up to two minutes. Otoacoustic sounds normally stay at the same frequency but when volunteers listened to low frequency noises the sounds their ears emitted began to slowly oscillate in frequency. The researchers say this is an indication that low frequencies were altering the mechanisms at work in the inner ear. The oscillation lasted for up to two minutes after the low frequency sound was played to the volunteers. "Strikingly, the effect of the low frequency stimulus on the cochlea persists for longer than the duration of the stimulus itsel, "Drexl points out. This can be interpreted as a change of the mechanisms in the inner ear, produced by low frequency sounds. This could be the first indication that damage might be done to the inner ear. Further experiments will probe the possibility that this phenomenon may be linked to noise-induced auditory damage, one of the most common causes of hearing impairment in industrialized countries.

Outer hair cells, which are responsible for amplifying sound waves in the ear, are more sensitive to low frequency sounds than inner hair cells. They are thought to be responsible for otoacoustic emissions and these results show that they could be affected when exposed to low frequency sound waves.

The team say the results could have repercussions in assessments of risk potential of exposure to low frequency sounds, for example those produced by wind turbines, block-type thermal power stations, and air-conditioning systems.

"We don't know what happens if you are exposed for longer periods of time, (for example) if you live next to a wind turbine and listen to these sounds for months or years".

So in summary it is possible that wind farm infrasound can cause hearing damage. We are seeing this happen to Leona Ehrfurth who is exposed to infrasound Generated by Cooling Towers on the east side of Green Bay. I would also like to Point out that Professor Alec Salt found damage to the inner hair cells of guinea Pigs exposed to Low Frequency noise, which is covered in his SAGE article called "Large Endolymphatic Potentials from Low Frequency and Infrasonic Tunes in The Guinea Pig".

26. Fibrosis ,Thickening and Scaring of Connective Tissue as a Result of Injury from Exposure to Low Frequency Noise and Infrasound. This includes damage to Lung Tissue, Heart Tissue, Blood Vessel Walls, Cardiac Valves and Pericardium Sac. Exposure will result in abnormal growth of collagen in blood vessel walls, tracheal wall pleural sac, stomach wall, and kidney glomeruli. Also the cilia that line the respiratory tract are severely damaged. The following article on Vibroacoustic Disease was presented at the 11 th International Meeting on Low Frequency Noise and Vibration and its Control "Vibroacoustic Disease- The Response of Biological Tissue To Low Frequency Noise".

27. Sensitization of people exposed to industrial wind turbine noise.

Some people experience annoyance and health problems as soon as they become exposed to the noise from industrial wind turbines. However there are also people who not experience symptoms until they have been exposed to the noise for some time. A good example of this is Pam Schauer who lives with her family near the Shirley Wind Project in Glenmore Wisconsin. Pam's family experienced symptoms as soon as the wind turbines started up, but Pam did not experience any symptoms until around 6 months after start up. So in summary it took 6 months of exposure to the noise before she became sensitized to the noise.

Dr. Sarah Laurie's testimony to the Australian Senate talks about a couple David and Alida that have negative health symptoms from Industrial Wind Turbines. David experienced health problems on start-up of the turbines but Alida did not experience symptoms until 4 years after start-up, therefore it took her some time to become sensitised to the wind turbine noise.

Dr. Neal Kelly who worked with NASA to develop Industrial Utility Wind Turbines was involved with a significant acoustic survey on a new 2.0 MW Industrial Wind Turbines that caused significant negative health problems to the residents In Boone County. This 1985 report indicates that residents became sensitized to the wind turbine noise.

28. Analysis of Aerodynamic Sound Noise Generated by a Large-Scaled Wind Turbine and its Physiological Evaluation.

The Japanese study which measured the brain responses of Japanese wind turbine workers when exposed to reproduced wind turbine sound, showed clearly and objectively that the brain could not attain a relaxed state. This research of aerodynamic noise generated from modern large-scale wind turbines (Enercon E40 three Bladed Upwind 600 Kw) was measured and analyzed from an engineering point of view. The measurement items were the sound, the sound pressure level (including the infrasound with extremely low frequency band) and the corresponding physiological evaluation. Fifteen test subjects (Wind Turbine Technicians who work

in close proximity to modern large scale wind Turbines) received various sound stimuli, including the recorded aerodynamic noise and a synthetic periodical sound, were examined with an electroencephalogram (EEG) as a physiological evaluation. It was observed from the mapping patterns of brain waves (which included alpha rhythm, beta rhythm, theta rhythm) that alpha rhythm, which indicates a relaxed and concentrated state, after the sound stimulus with the frequency band of 20 Hz, showed the lowest value among the other cases. That is, the test subjects cannot keep relaxed and their concentration, after hearing the sound stimulus at the frequency band of 20 Hz. The induced rate of alpha rhythm decreased further when the test subjects listened to decreased frequency sound meanwhile, beta rhythm, which shows a strain state, after the sound stimulus with the Frequency band of 20 Hz, showed the highest value among other cases. Therefore, the infrasound (low frequency and inaudible for human hearing) was considered to be an annoyance to the technicians who work in close proximity to modern large scale wind turbines.

29. Question From Richard James to Professor Alec Salt. "Does Infrasound From Wind Turbines Affect The Inner Ear?

Professor Alec Salt said that the average G Weighted Noise from Wind Turbines with Upwind Rotors has been around 70 dBG. This is substantially below the Threshold for Hearing Infrasound which is 95 dBG, but is above the Outer Hair Cell (OHC) Stimulation of 60 dBG. This suggests that most wind turbines will be producing an Unheard stimulation of the OHC.

30. Additional Information from Professor Alec Salt

Alec Salt, professor at Washington State University in the Cochlear Fluids Research Laboratory, has written several papers and presented to conference on the infrasound or low frequency noise, most recently at the international Inter-Noise conference in New York in August 2012. In a communication to Wind Concerns Ontario and others, Dr. Salt said that he is convinced now more than ever, based on his research, that the infrasound produced by industrial wind turbines can cause harm to human health, and and further, that the harm may be irreversible for some people with long exposure.

Infrasound affects individuals even though it cannot be heard, he demonstrates, and can result in sleep deprivation which in turn can cause indirect health effects, such as elevated blood pressure, anxiety, memory dysfunction and more. "This is not speculation." Dr. Salt said in his presentation to the international scientists. "The phenomenon now needs to be studied in more detail." The wind power development industry, however, completely denies the impact of infrasound, saying that sound that cannot be heard, cannot have an effect.

31. Health Problems at the Lammefjordens Stauder Nursery in Gislinge Denmark

Boye Jensen the nursery owner for the Lammefjordens Stauder Nursery had to shut

down his 43 year business due to loss of employees due to illness from the wind turbines installed near his business. All the female employees were complaining of irregular menstruations and several had permanent headaches. The women were complaing of unusual bleeding and problems with their menstrual cycles.

32. Effects Wind Turbines Have on Domestic Animals, Farms & Wildlife

We know that animals living in the vicinity of Industrial Wind Turbines suffer a wide range of pathologies. Of highest concern are the deaths of otherwise healthy animals, the stillbirths, exploded lungs, blade strikes and the deformities in newborns and yearlings. Since animals can't read propaganda material, or listen to the radio or TV, nor surf the Internet, you then cannot say that their pathologies were caused by anti-wind campaigns or nocebo effect. Listed below are some of the cases where Industrial Wind Turbines have caused harm to animals. Mounting anecdotal evidence suggests for caution before building wind turbines in areas near people, animals and wildlife and livestock. It is dangerous to assume that industrial wind turbines are safe when you look at the evidence:

a. In Vildbjerg Denmark a mink farm had 1600 stillborn baby minks one month after start-up of the 3.0 MW wind turbines. See page 4 item #7.

b. In Taiwan a goat farmer Kuo Jin-Shan lost 400 goats since the start-up of eight wind turbines installed by Power Company Tai-Pow. The farmer blames the deaths on the near-by wind turbines. His claim is backed by the Ministry of Agriculture inspector Mr Lu Ming –Tseng.who said unusual sounds can impact animals appetite, growth and sleep. The farmer has stated that the goats had been unable to sleep and began losing weight prior to their deaths. Taipower has agreed to help pay the farmer to move his flock to a quieter place. The ministry of Agriculture says it suspects that the noise may have caused the goats demise through lack of sleep.

c. Farmer Kevin Ashenbrenner in the town of Glenmore Wisconsin near the Shirley Wind Project has lost 19 cows, 1 bull and 30 calves including a significant drop in his milk output. His family has also suffered from severe headaches and migraine headaches. One cow that was ill, was removed from the site and taken to a farm far away from the Wind Turbines and that cow recovered.

d. A horse trainer in Ripley Ontario Canada had problems with his horses when the 2.0 MW Wind Turbines owned by Suncor Energy started up. As a result the Horse trainer moved to another location and the house was sold to Suncor. See Page 12 Property #4.

e. In 2006 a Wind Turbine Project started up called the Kingsbridge 1 Wind Power Project. The project is located on privately-owned leased lands located between Goderich and Kincardine Ontraio. This project has 22 Industrial Wind Turbines

that are 1.8 MW Vestas V80 turbines. A cattle farm owned by Ross and Darlene Brindley was driven out of business due to the negative health of their cattle after start-up of the Wind Turbines in 2006. A statement of claim filed in Superior Court of Justice, said that their cattle exhibited aggressive and erratic behavior, including kicking of newborn calves, prolapsed birthing, weight loss, decline in fertility, a high incidence of mastitis, calves being deformed at birth and a high incidence of stillbirths. The problems with the herd resulted in the closure of the business.

f. In Ontario, Canada a goat farmer reported that all 20 of his nanny goats miscarried or had kids that died within hours of birth. In that year the farmer did not have any kids that survived.

g. In 2012 when the Waterloo Australia Wind Farm started up farmer Neil Daws chickens started laying yolkless eggs. Later they did not lay any eggs. One of his neighbors a long term sheep farmer reports a three-fold spike in birth defects since the turbine start-up. Lambs have been born with no ears, with three legs and hoofs turned backward. THE Waterloo Wind Farm has 37 Vestas V90-3MW turbines each 80 meters (262.47 ft) tall with 44 meter long (144.36 ft) blades.

h. The Ocean Breeze Emu Farm owned by Dave and Deb Van Tassel in Gullver's Cove Nova Scotia was forced to close due to the loss of 30 of their 38 emus. The deaths began in 2010 when Nova Scotia Power started up 20 Industrial Wind Turbines that were 1.5 MW each. During the 18 + years before the wind turbine start-up they did not have any problems with their birds, no unexpected deaths and no agitation. Nova Scotia Power started up this wind facility called Digby Neck Wind Farm in December 2010. The closest wind turbine to the Ocean Breeze Emu Farm was 850 meters (2789 ft) from the farm.

i. Chicken Farmer James Vollmer lives in Malone Wisconsin near the WE Energy Blue Sky Green Field Wind Energy Center. This Wind Energy Center has 88 Industrial Wind Turbines that are Vestas V82 turbines rated at 1.65 MW. In addition to his health Problems and his family health problems Jim has had major health problems with his chickens since the start-up of this Facility on May 19, 2008.In his 21 years of raising chickens Jim has never had the problems that started since May 19, 2008. Out of 150 chickens Jim lost 50 chickens and numerous birth defects which he never had before. The birth defects included missing eyes, eyes sticking out of their head, twisted beaks, deformed heads and malformed legs. He later found a study that was done by the United States Army Aeromedical Research Laboratory on the Effects of Vibration and Amplitude on Developing Embryos. This study goes into great depth and the procedure they used in the study of how the birds hatch rates were diminished from low frequency vibration. It also caused the same birth defects that he had struggled with. He had raised several thousand birds over the years and had never experienced these problems until the wind turbine start-up. Jim had tried moving some of his chickens to locations away from the turbines and they would sleep for about three days straight and then would

recover. Jim had also noticed a reduction in wildlife around his farm. Prior to the wind turbines he had up to 22 barn swallows in nests in his barn rafters, but since the turbine srart-up the swallows have left. He also noticed that barn owls are now gone. It is Jim's opinion that his chickens cannot sleep properly which is causing the problems.

k. A recent study conducted by the Royal Veterinary College and the Zoological Society of London conducted a study of health effects on badgers by monitoring nine badgers living within 1km of wind turbines verses 16 badgers (control group) living at least 10 km from any wind turbines. They monitored the cortisol levels in the hair of the badgers and found that the hair of the badgers living less than 1 km from the wind turbines had 264 % higher cortisol level than the badgers living at more than 10 km from any wind turbines. Their conclusion was that the affected badgers suffer from enhanced hypothalamo-pituitary-adrenal activity and are physiologically stressed. So in summary the stress levels of the badgers living near the wind turbines was 265 % higher than the control group living more than 10 km away from the turbines. This study was conducted in 2013.

l. Ann & Jason Wirtz bought their farmhouse near the Town of Oakfield in Dodge County on June 1, 1996. On this farm they raise alpacas. In March of 2008 Invenergy started up their Wind Farm called the Forward Energy Center located in Dodge and Fond du Lac County Wisconsin. This Wind Farm has 86 wind turbines that are GE 1.5 MW units or 129 MW total. The closest turbine is 1300 feet from the Wirtz home. Upon start-up the Wirtz Family had troubles sleeping at night, and there was troubles with their animals as well. Ann says the alpaca became jumpy the first day the turbines went on line. Normally they are calm. But on the day the towers started up, they seemed to panic. They were on their back legs right away. Ann said the herd had always been docile and healthy, with no breeding problems. Since the wind farm started up, their temperament has changed and none of the females have been able to carry a pregnancy to full term. Pregnancy always results in miscarriage or stillbirth.

m. Joe Yunk a farmer located at N2630 Townhall Road Kewaunee Wisconsin lost 10 beef cattle after the start-up of the WPS Lincoln Wind Energy Facility which started up in the summer of 2000. Mr. Yunk had not lost any cattle prior to the wind turbine start-up. Many families including Joe Yunk had experienced health problems after the start-up. WPS bought two family homes near Joe's home who were claiming illness. So Joe retained a lawyer and filed suit with WPS. Joe gave deposition in the summer of 2008 and was scheduled to go to trial in September 2009. In August 2009 he was offered $163,000 (on a property appraised at $168,000, Joe took the offer.

33. Poland National Institute of Public Health & The Polish Senate

On July 1, 2016 the Poland National Institute of Health & the Polish Senate passed a new law that adopts a mandatory setback for industrial wind turbines of 10 times the turbine height or around 4270 feet on a 2.5 MW Turbine.The National Institute of Health had evaluated the problems they were having with industrial wind turbines and are of the opinion that wind farms situated too close to buildings intended for permanent

human occupation may have a negative impact on the well-being and health of the people living in their proximity. In the Institute's opinion the laws and regulations currently in force in Poland are not only inadequate ro facilities such as noise from wind turbines, but they also fail to guarantee a sufficient degree of public health protection. The methodology that was used for environmental impact assessment of wind farms (including human health) was not applicable to wind speeds exceeding 5 meters per second. In addition, it did not take into account the full frequency range (in particular, low frequency) and the nuisance level.

34. Towns That Have Voted Against Wind Farms

(1) Stiles Brook Wind Project in Vermont

The Wind Farm Developer Iberdrola Renewables proposed a 28 wind turbine Wind Farm for the towns of Windham and Grafton Vermont. This project would use 3.45 MW turbines for a total 96.6 MW total. Iberdrola Renewables LLC is a company located in Valencia Spain with offices in the USA. As part of this project Iberdrola would pay $715,000/yr to the town of Windham and $285,000 to the Town of Grafton ($1,000,000/yr Total for both towns), which is primarily property tax payments. Then due to the public objection to this project Iberdrola modified their proposal. First they offered to reduce the project to 24 Wind Turbines (or 82.8 MW) and then later to 16 Wind Turbines (or 55.2 MW). In addition Iberdrola increased their revenue offer from $1,000,000/yr to $1,500,000/yr which is broken down as follows:

	Payment to Windham	Payment To Grafton
a. Property Tax Payment	$395,000/yr	$230,000/yr
b. Supplemental To Town	$105,000/yr	$30,000/yr
c. Community Use	$150,000/yr	$25,000/yr
d. For Residents -Partnership	$350,000/yr	$215,000/yr
e. Total	$1,000,000/yr ($1162/yr/voter)	$500,000/yr ($428/yr/voter)

On November 8, 2016 the towns took a vote on this project and renounced the Stiles Brook Wind Plan. The residents votes are listed below:

	Votes For The Project	Votes Against the Project	Total Votes
Windham Vermmont	101	181	282
Grafton Vermont	158	235	392
Totals	259	416	675

So based on the above votes, 61.63 % of the voters voted to reject the project. With Vermont State approval Iberdrola could still move ahead with this project but they

decided to cancel this project. Iberdrola is offering their plans for a fee if a developer is interested in this project.The American Bird Conservancy and the Windham Foundation opposed this project.The State Vermont Secretary questioned the legality of the Partnership Payments to residents but the Vermont Attorney General's Office reviewed the issue and decided the payments did not violate state election laws.

35. Unusual Bleeding and Problems with Menstrual Cycles

A 10 turbine wind farm installed by the Developer Vattenfall in the Holbaek Municipality in Denmark has female workers at the Lammefjordens Perennial Farm complaining of irregular menstruations and have permanent headaches. The owner of this nursery Boye Jensen had 5 female workers quit due to their health problems. Boyce the had to shutdown his business. The Holbaek Municipality has instructed Vattenfall to stop the turbines in Hageholm until they can produce approved noise measurements. The Wind Turbines are 2.3 MW Siemens uints. This installation is called the Hageholm Windmills Park at Holbaek Denmark. Boye Jensen and his wife became ill at their home and have Rented a house in Gisling to get quiet and sleep. Other families have left their homes. Some residents have experienced tingling in the hands and chest tightness.

36. Developmental Tissue Damage Causing Flexural Deformities In The Front Limbs Of Foals at the Lusitano Stud Farm In Portugal.

In November 2006 a Wind Farm in Portugal called the Alto Do Folgorosa Facility started up the first 4 of 9 total wind turbines that were 2.0 MW each. One of the 4 units was later removed due to legal action and in September 2008 they installed six additional units. Near this wind farm is a Lusitano Stud Farm near the Lisbon Municipality of Torres Vedras Portugal.The wind turbines are approximately 350 m (1148 ft) to 800 m (2625 ft) from the stud farm. This stud farm had been in operation since the year 2000 breeding normal and physically sound horses, but in 2008 the observed new born foals developed flexural deformities. Due to illnesses from the turbines the family had to leave the home at the stud farm. Tissue analysis of the defected tendons were performed and reveled the classical features of LFN-induced biological responses: thickening of blood vessel walls due to proliferation of collagen in the absence of an inflammatory process. This all came out in a study performed at the School of Veterinary Medicine, Technical University, Lisbon Portugal. The study war written up as a Master's Thesis titiled " Acquired Flexural Deformity of the Distal Interphalangic Joint in Foals" By Professor Mariana Alves- Pereria. In this study these horses were monitored for a Period of four years. The study was performed by Teresa Margarida Pereiraosta e Curto. A total of 11 affected animals were studied, 9 were born at the stud farm and 2 were Acquired from a different breeder.Six of the horses were males and 5 were females. The two foals brought to the stud farm were brought to help investigate a possible genetic cause and these two also developed deformities after 6 months. Two of the affected foals were placed in a pasture away from the intial one and two others were admitted at the Faculty of Veterinary Madicine of Lisbon. In those animals, except for one that had to be euthanized for humane reasons, an improvement was observed on their condition,with partial recovery of the deformity.

37. Acoustical Engineer Steven Cooper of Australlia proves that wind turbine sensitized people can sense the inaudible infrasound noise from wind turbines.

Steve Cooper is the acoustical engineer who conducted a significant noise study of the Wind Farm known as Cape Bridgewater (see #1 in this document). Steve used the inaudible Infrasound noise in his lab exposing wind turbine sensitized people to this noise. These people became sensitized to this noise during their exposure in their homes near the Cape Bridgewater Wind Farm. Mr. Cooper used this inaudible noise to see if the people could sense this wind turbine noise. All of the people could sense the noise each time Cooper turned the noise on and off. The Wind Industry has been saying that the noise is inaudible therefore it can't effect a persons health. Sensing the inaudible noise is step one to proving the illnesses. The family of Darren & Sue Ashley who live near the Shirely Wind Turbines in Glenmore Wisconsin is a family that could sense the wind turbines when they started up and when they shutdown without any audible noise from the wind turbines. Also the wind turbines cannot be seen from inside the home so when they experienced something they would have to step outside to see if the turbines were rotating. There is a U-Tube Video of the Ashley family discussing this sensation, the video is called "The Unvarnished Truth Shirley Wind Project Victims Speak Out". This video was produced many years before Acoustical Engineers decided that many of the sensitized people may be sensing (not hearing the Infrasound). It should be pointed out that some homes do have both audible noise and inaudible Infrasound noise.

38. Fight or Flight Response

On Wednesday June 8, 2016 Dr. Jay Tibbetts was at the home of Dave Enz, with Dave and Jim Protsman. The purpose of this meeting was to access the health effects from the Shirley Wind Turbines. On that day with the Shirley Wind Turbines operating, Jay experienced a condition called Fight or Flight Response (also called hyperaerosol or the acute stress response) which is a physiological reaction that occurs in response to a perceived harmful event, attack, or threat to survival. Jay told me that his symptoms did not begin right away, he said he had been at the home for some time before experiencing symptoms. When Jay began experiencing the Flight Response, he told Dave & Jim what he was experiencing, and told them what it was since he was familiar with this stress response. The stimulus causing Flight Response could be vibration of body parts, vibration on the skin, or a menacing sound like infrasound or noise air pressure pulsations created by the blades passing the tower and its harmonics. These stimuli are picked up by the Sensory Thalamus, which sends a message to the Sensory Cortex, which then sends a signal to the Amygdale. In some cases the Sensory Thalamus will send a signal directly to the Amygdale without passing through the Cortex. The Amygdale is a part of the brain that reacts to the fight or flight response by sending a signal to the sympathetic nervous system which stimulates the adrenal glands to release adrenaline (epinephrine), cortisol, and noradrenalin into the blood stream. These stress hormones cause several changes in the body. The autonomic nervous system has a component called the sympathetic nervous system that functions like a gas pedal in a car, it triggers the fight-or-flight response, providing the body with a burst of energy, so it can

espond to perceived dangers. The release of these stress hormones which rouse the body for emergency action can cause the following:

1. Increase in resting heart rate.
2. Increase in Systolic Blood Pressure & Diastolic Blood Pressure.
3. Increase in blood flow to the muscles, arms, legs, shoulders, brain, eyes, ears and nose.
4. Decreased blood flow to the digestive system and to surface of the body, fingers and toes.
5. Increased Breathing Rate and thus increased Oxygen intake.
6. Shortness of Breath and Dizziness sometimes caused by increased Breathing Rate.
7. Dilated Pupils to let more light in and improve sight.
8. Increase in Cortisol Levels
9. Hearing may become more sensitive.
10. Sweating
11. Sweating of palms
12. Heart Pounding.
13. Tense muscles.
14. Chest pain or tightness.
15. Nausea, stomach pain or diarrhea.
16. Dizziness or light-headedness.

17 Tingling, often in the fingers.

The Fight or Flight Response is one of the symptoms that people experience when exposed to wind turbine noise.

B. Cumulative Danger from Over-Activation of Our Fight or Flight Response

The evidence is overwhelming that there is a cumulative buildup of stress hormones. If not properly metabolized over time, excessive stress can lead to disorders of our autonomic nervous system (causing headache, irritable bowel syndrome, high blood pressure and the like) and disorders of our hormonal and immune systems (creating susceptibility to infection, chronic fatigue, depression, and autoimmune diseases like , lupus and rheumatoid arthritis allergies).