Real Estate Consulting Report

Impact Analysis of the Niyol Wind Farm on Surrounding Rural Residential and Agricultural land Values in Logan County Colorado

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Stock photo of Colorado Wind Farm

Impact Analysis of the Niyol Wind Farm on Surrounding Rural Residential and Agricultural land Values in Logan County Colorado

Report Summary

This report was contracted by Concerned Citizens for a Safe Logan County for our opinion on how the Niyol Wind LLC will impact rural residential and agricultural farm values within the wind farm footprint and 1-mile outside of this zone of this proposed wind farm.

Proposed Wind Farm

The proposed 200.8MW wind farm is called the Niyol Wind LLC. The developer is Niyol Wind, LLC, which is a wholly owned subsidiary of NextEra Energy, a Delaware Corporation (700 Universe Boulevard, Juno Beach, Florida). The wind farm is located in the Fleming area, Logan County, Colorado. The conditional use permit submitted by Niyol states that the wind farm will occupy 39,314 acres of area. The development will have 89 wind turbines, having a height (including the tower and blades at 12 o'clock position) of 495ft -505ft. The project will include graveled access roads over private land to the wind turbines, a maintenance area of approximately 4-acres, a substation of 10-acres graveled with a chain-link security fence and outside yard lighting, two meteorological towers being 275ft in height, underground and above ground electrical supply lines and a thirty-one mile 230kV high voltage transmission line that is to link up with an existing high voltage transmission line for transmission of the produced energy.

The three-blade wind turbines will be one of two models: the GE 2.5MW turbine or the GE 2.8MW

Turbine. Their designs follow.

Figure 1. GE 2.5 MW Turbine Diagram

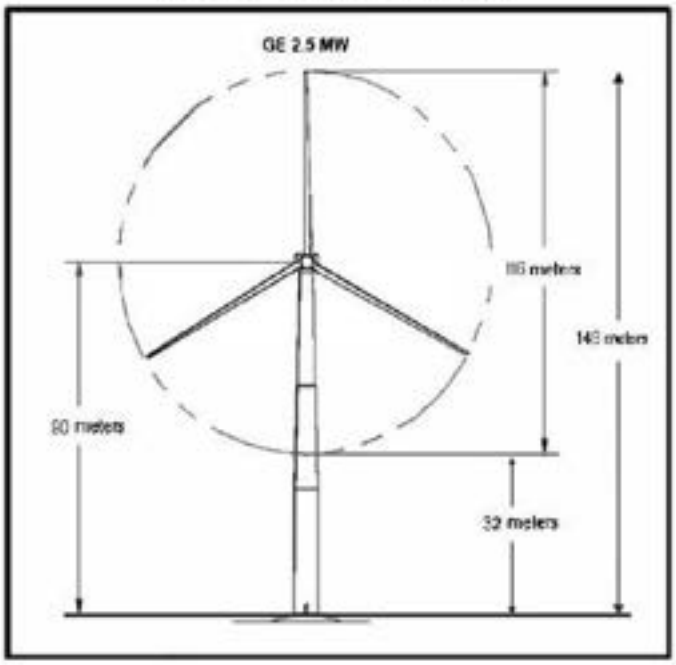
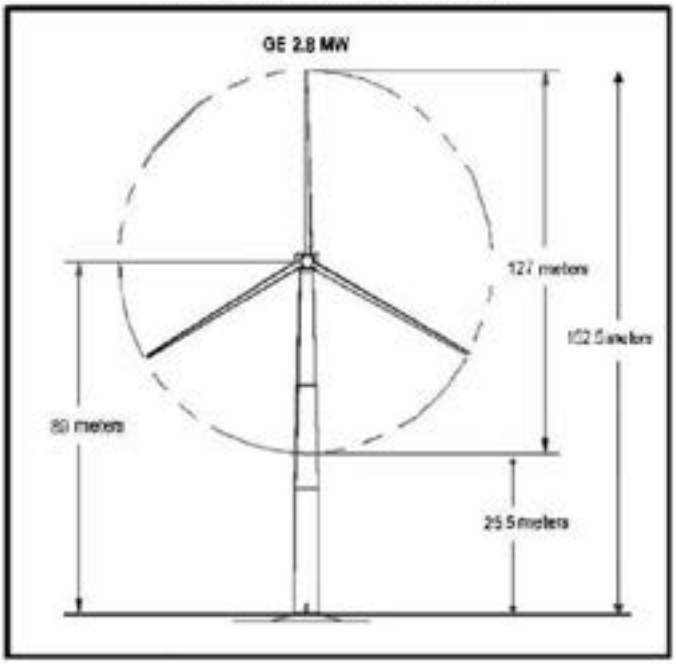
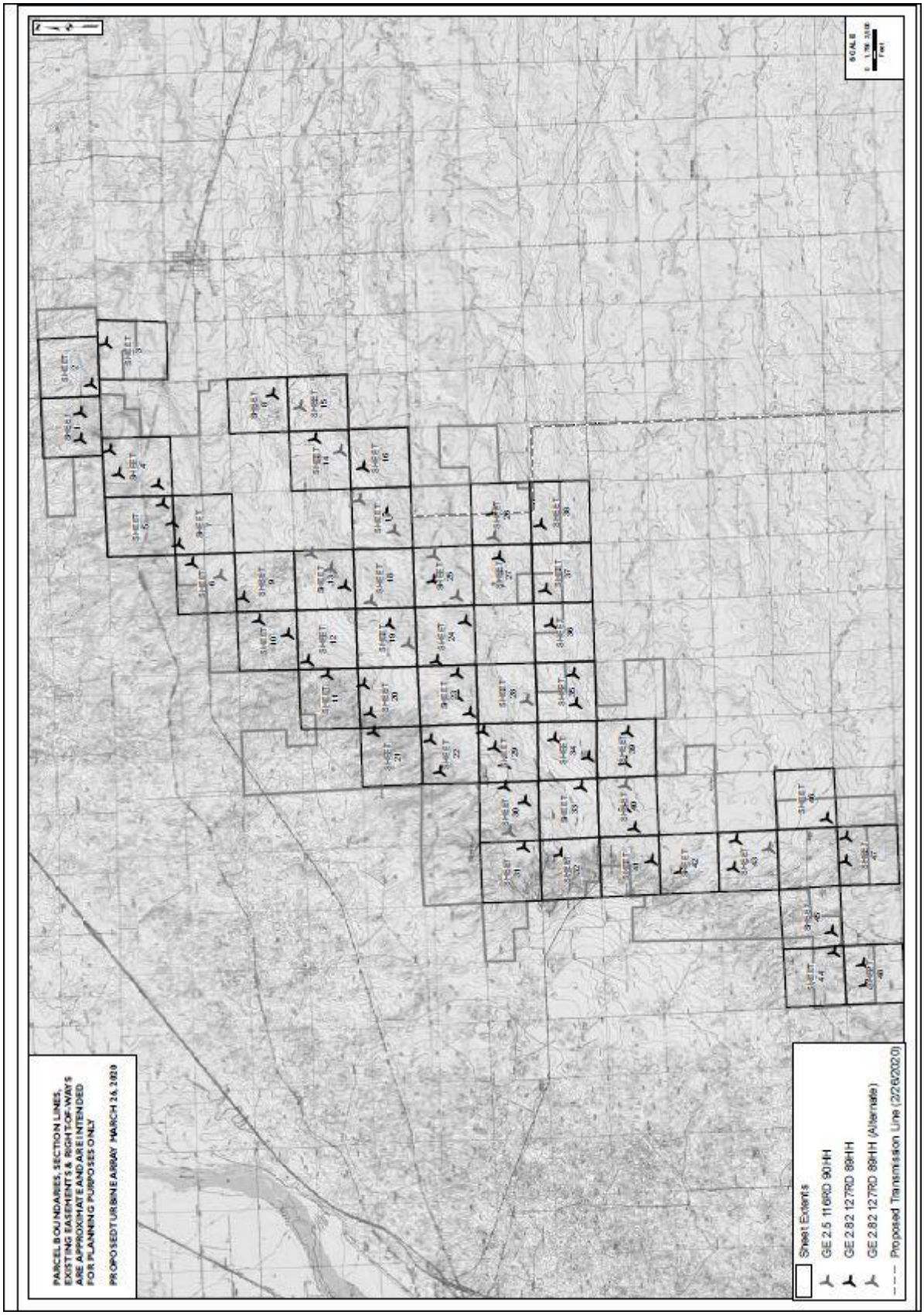


Figure 2. GE 2.8 MW Turbine Diagram



The electrical collector lines are to be buried, the collector substation is above ground and connected to an overhead 230kV high voltage transmission line. The map on the next page illustrates the wind farm project.


PARCEL BOUNDARIES, SECTION LINES, EXISTING EASEMENTS & RIGHT-OF-WAYS ARE APPROXIMATE AND ARE INTENDED FOR PLANNING PURPOSES ONLY
PROPOSED TURBINE ARRAY MARCH 26, 2020
SCALE
Sheet Extents
GE 2.5 116RD 90HH
GE 2.82 127RD 89HH
GE 2.82 127RD 89HH (Alternate)
Proposed Transmission Line (2/26/2020)

Format of Study

The format of the study is in three parts. The first part is a qualitative analysis. The second is a quantitative analysis. The third is to apply the qualitative and quantitative conclusions to the subject properties.

A *qualitative* analysis is an analysis that is focused on non-empirical data to guide a conclusion of value. An example would be an observation that a home has better landscaping than another. Another example would be opinion surveys. Application of this type of analysis is helpful in forming a "yes/no" answer to the question "Does proximity to wind turbines negatively impact property value?"

A *quantitative* analysis is an analysis that is focused on empirical or measurable data to guide a conclusion of value. An example would be a matched pair comparison of a sale of a property influenced by a wind turbine as compared to one that is not. The difference in value is measurable. Another example would be a regression analysis whereas the sale price of several "influenced" properties would be compared to the several "non-influenced" properties. Again, a measurable event.

The advantage of using both methods is that they have a symbiotic relationship and help give a full picture of both the motivations and results of such motivations by the buying public to a particular issue. In this case, the presence of a wind farm.

The first part is a literature study to discover what the buying public is reading, viewing and learning through various communication platforms regarding wind farms and land use which would impact their opinion of value. This is a *qualitative* analysis of the impact on property value. The literature study was broad in scope focusing mostly on North America but including other developed nations. We did this for two reasons. First, the typical buyer of properties that would be impacted by wind farms develop their perception of property value and its use from not only their own observations but observations of others. Though these buyers will be from the United States they are sophisticated to understand that the impacts of wind farms are not a locale geographic issue. Second, these same buyers understand the wind turbines being utilized in other developed countries are the same or similar to the ones utilized in the United States, therefore the impacts would be similar.

The second part is a summary of wind farm value impact studies that are applicable to this analysis. This is a quantitative analysis of the impact on property value. The impact studies that were reviewed include both published and unpublished studies, large and small in scope. These studies tend to counter the utility corporate sponsored studies and need to be included as they give insight to the potential impacts that wind farms have on property value.

The third part is to apply the qualitative and quantitative studies to the rural residential and agricultural property values within the Niyol wind farm footprint and also a 1-mile perimeter outside of the wind farm.

Results of Study

The study results are summarized as follows.

Literature Study	The media generally portrays the impact of wind turbines on residential properties as negative, bringing up fear factors and conflicting benefit, or no benefit issues. Overall, the qualitative factor is centered along the lines of health, noise, flicker, and viewshed. With regard to the question, "Do wind turbines affect property value?" the two Centerville Township (Michigan) officials summed it up with this statement: "It is totally counter-intuitive to suggest anything else."
Impact Studies	Wind industry and government supported studies found little to no evidence of an impact. However, independent studies found a significant impact using a variety of valuation methods from paired sales analysis to multi-regression analysis. The Landsink (Ontario, CA) study found a loss range of -8.85% to -50%, with a loss average of -39% for residential homes within 664ft to 2,531ft of a wind farm. The Appraisal Group One Wisconsin Study found a typical loss of 1-10 acre residential lots within ½-mile of wind turbines to be -19% to -40%. The Clarkson University upstate New York study of both residential and agricultural properties found a loss ranging from -15.6% to -31% within 1-3 miles of a wind farm. The Forensic Appraisal Coral Springs (WY) study of large residential lots (35 acres) which would be abutting a proposed wind farm suffered a value impact of -25% to -44%. The McCann study (IL) of residential properties found an average impact of -25% within 2-miles of a wind farm. The Forensic Appraisal Big Sky (IL) study found a loss range of -12% to -25% of residences within 0.31mi to 1.72mi of a wind turbine, with an average impact of -19% at an average distance of 0.65 miles to a wind turbine. The Twin Grove II Wind Farm (McLean County, IL) study of a 198MW wind farm comprised of 120 turbines being 397ft in height over an 11,000 acres area. A paired sales analysis of residential property within the influence of the wind farm found the improved property is negatively impacted by the presence

	of wind turbines. The impact measured ranged from -46.6% to -7.7%, with the higher impact closest to the wind turbines and the impact diminishing as the distance is increased. The distances measured ranged 1,483ft to 5,481ft away from a residence. The Twin Grove II Wind Farm also found an overall impact of -6.63% to -8.5% for vacant agricultural properties within the wind farm zone.

Application of Studies to the Niyol Wind Farm

The quantitative analysis provided by the studies and qualitative analysis provided by the literature review submitted in this report show two different stories.

One story is that there is no impact on property value due to the presence of wind turbines regardless of the distance to the property. The authors of this position tend to be academicians using statistical analysis. This story is difficult to accept for if we were to take it at face value, we would have to conclude that viewsheds do not matter (Hoen et al refutes that position in their discussion of viewsheds) and no distance to a wind turbine is too close. Comments from Realtors through surveys, testimony, and letters refute that notion. Logic would also question that position. A survey of experienced appraisers who attended the Appraisal Institute webinar Wind Turbine Effects on Value (March 2015, Hoen & Jackson) [1] overwhelmingly stated that they believe wind turbines negatively impact property value. To add to the disbelief of the "no impact" position is that the wind farm developers consistently refuse to "guarantee" that there will be no property loss or purchase the properties from property owners who desire to leave the area due to the development. If the wind developers believed these studies, there would be no risk in taking such a position and it would effectively negate opposition. (As a side note, electrical transmission line developers in Minnesota must buy any property that is encumbered with a new electric transmission if the property owner claims the "buy the farm" provision. So, though rare, there is a precedent of energy developers buying properties that are impacted, or thought to be impacted, by their development.)

The other story is that there is a measurable negative impact on property value due to the presence of wind turbines and that this impact is in direct relation to the distance and viewshed of the turbines. The authors of this position are dominated by real estate appraisers and realtors, often utilizing comparative sales analysis as their method of study. The results of these studies (and others completed by some academicians) have cited losses from 10% to over 50% depending on the distance and viewshed factors. Additionally, they have concluded that these losses are found to begin at the wind farm announcement stage leading to the post-construction stage.

Agricultural land also is impacted by the presence of a wind farm losing -6.3% to -8.5% of its overall value if located within a wind farm.

It is concluded that the qualitative and quantitative evidence supports the position that the presence of

1 *Wind Turbine Effects on Value*. Appraisal Institute, Chicago. March 5, 2015. Ben Hoen and Thomas Jackson, Ph.D., were the presenters.

wind turbines in close proximity to properties will have a negative impact on property value and this impact is permanent. And, the closer the properties are the wind turbines the greater the impact.

We conclude that the following impacts will be experienced by the Niyol wind farm on the client's properties:

Properties within the Wind Farm Footprint= -35% impact on property value
Properties 1-Mile outside of the Wind Farm Footprint = -22% impact on property value
Agricultural Properties within the Wind Farm Footprint= -8.5% impact on property value

Application of these estimated losses to the client's property value is:

Niyol Wind Farm Loss to Property Value Estimate			
	total assessed value	**impact**	**value loss**
Properties within the Footprint	$4,014,430	-35%	-$1,405,051
Properties 1-mile outside of the Footprint	$6,948,960	-22%	-$1,528,771
Total			**-$2,933,822**

Sincerely,

Kurt C. Kielisch, ASA, SR/WA, R/W-AC
President/Senior Appraiser

Literature Study

Literature Study

Perception=Value

It is important to remember "perception drives value." This may appear to be an overly simplistic statement, but what a buyer believes a property is worth and how a buyer acts based on that belief, are truly the core elements of market value. Therefore, to understand market value, appraisers need to examine its driving element – perception. Perception is strongly influenced by the media which is no longer limited to the traditional print, radio, and television venues, but also includes the Internet. The Internet brings opinions, facts, and stories from all over the nation and the world, influencing one's perception. This perception need not be based on fact; it simply has to be believed and then acted upon to result in an impact

Some argue that perception is simply revealed by comparable sales. It is true that the resultant action of perception is quantified in the sale, but it may not be true that the underlying perception driving that action is defined by the sale. In appraisal, we call this the *qualitative factor*. Often this factor is identified in appraisal analysis as a judgment call based on perception such as "fair" in a quality description or "undesirable" as to a view. To achieve this perception, the appraiser needs to look deeper into the driving force of the action by reviewing what is being said in the media regarding the question: "Do wind turbines affect property value?" Such a study may be useful to an appraiser to put a qualitative value on this perception when estimating the impact that a Wind Farm may have on property value.

Following is a summary of our findings from published sources outside of the trade industry to get a measure of the public's perception of wind turbines and their potential impact on property value.

Health Issues

Many people living near operating wind turbines are reporting neurological and physiological disorders that are only resolved when the turbines are off, or when they leave the area. Common symptoms include sleep problems, headaches, dizziness, unsteadiness and nausea, exhaustion, anxiety, anger, irritability and depression, problems concentrating and learning, and Tinnitus (ringing in the ears).[2] Symptoms can be experienced up to 1.2 miles away in rolling terrain; 1.5 miles away in valleys; and 1.9 miles away in mountainous regions.[3] These symptoms are commonly being referred to as "Wind Tower Syndrome"[4] in the U.S., but they are the same symptoms of a proven ailment, Vibroacoustic Disease (VAD).[5]

In 2007, two Portuguese scientists found that the amount of infrasound and low-frequency noise (LFN)

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2 Nina Pierpont, MD, PhD, *Wind Turbine Syndrome: Testimony Before the New York State Legislature Energy Committee*. March 7, 2006.
3 Ibid.
4 Ibid.
5 Mariana Alves-Pereira, Nuno A. A. Castelo Branco, *Second International Meeting on Wind Turbine Noise*. Lyon, France – September 20-21, 2007.

generated by wind turbines is conducive to VAD.[6] Symptoms include slight mood swings, indigestion, heartburn, mouth/throat infections, bronchitis, chest pain, definite mood swings, back pain, fatigue, skin infections (fungal, viral, and parasitic), inflammation of stomach lining, pain and blood in the urine, conjunctivitis, allergies, psychiatric disturbances, hemorrhages (nasal, digestive, conjunctive mucosa) varicose veins, hemorrhoids, duodenal ulcers, spastic colitis, decrease in visual acuity, headaches, severe joint pain, intense muscular pain, and neurological disturbances.[7]

Besides noise, wind farms can electrically pollute their surroundings.[8] A study of before-and-after sound waveforms demonstrates how overexposure to high frequencies can cause symptoms such as ringing in the ears, headaches, sleeplessness, dangerously high blood pressure, heart palpitations, itching in the ears, eye-watering, earaches, and chest pressure. All are symptoms of Radio Wave Sickness – a proven phenomenon that predates Wind Tower Syndrome. It takes very little exposure to start experiencing these symptoms.[9]

The symptoms became so bad that four families had to abandon their homes near the wind farms – prompting the wind company to bury the collector line for turbines near the worst-hit homes. They also put an insulator between the neutral line and the grounding grid. It reduced the high frequencies but didn't completely resolve the situation.[10]

In 2009, Minnesota's Department of Health released a study on the public health impact of wind turbines. They found that wind turbines generate a broad spectrum of low-intensity (frequency) noise. Though homes typically block most high-frequency noise, they do little to weaken low-frequency noise. Sleeplessness and headaches are the most common health complaints associated with proximity to turbines and are highly correlated with annoyance complaints. Most available evidence suggests that reported health effects are related to audible low-frequency noise. LFN is typically a non-issue at more than a half mile. However, differences in terrain or different wind conditions could cause the sound to reach further. Unlike LFN, shadow flicker can affect people outdoors and indoors. They recommend the following: further testing to determine the LFN impact; evaluating potential impacts from shadow flicker and visibility; estimating the cumulative noise impacts of all wind turbines.[11]

Although acousticians and engineers working for the wind energy industry conclude that audible noise and low-frequency noise from wind turbines are unlikely to cause health effects, experts in biomedical research have drawn different conclusions.[12]

Industry advocates commonly quote the WHO Community Noise Paper of 1995 which says, "There is no reliable evidence that infrasound below the hearing threshold produces physiological or psychological

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6 Ibid.
7 Ibid.
8 Catherine Klieber, *Modern Wind Turbines Generate Dangerously "Dirty" Electricity***.** Dirtyelectricity.ca. April 28, 2009.
9 Ibid.
10 Ibid.
11 *Public Health Impacts of Wind Turbines***.** Minnesota Department of Health Environmental Health Division. May 22, 2009.
12 Barbara J. Frey, BA, MA and Peter J. Hadden, BSc, FRICS, *Noise Radiation from Wind Turbines Installed Near Homes: Effects On Health – With an annotated review of the research and related issues***.** February 2007, June 2007.

effects." However, the final WHO document of 1999 reversed that statement: "The evidence on low-frequency noise is sufficiently strong to warrant immediate concern."[13]

A British study surveyed 39 residents already known to be suffering from problems they felt were due to their close proximity to the turbines. On average, 75% of them reported fatigue, lack of sleep, and headaches. Half reported stress and anxiety, and a quarter reported migraines, depression, and tinnitus.[14]

It is clearly evident that there are people living near turbines who are genuinely suffering from health effects from the noise produced by wind turbines[15] – despite developers' and some acousticians' claims to the contrary.

Field studies performed among people living in the vicinity of wind turbines showed that there is a correlation between sound pressure levels and annoyance, but that annoyance is also influenced by other factors such as attitude to wind turbines and the landscape. However, noise annoyance from wind turbines was found at lower sound pressure levels than in studies of annoyance from road traffic noise. This is because the absolute noise level is less important than the character of the noise produced.[16]

People are "in an extremely delicate state of equilibrium with the sonic environment and any profound disturbance of this system will have profound ramification to the individual." Our auditory and cerebral systems are extremely complex. Thus, issues surrounding noise annoyance/disturbance and associated health effects are not simple. The noise produced from wind turbines is extremely complex…and it is the complexity of the noise and vibration which causes the disturbance.[17]

Low-frequency noise is also produced by wind turbines. It's mainly the result of the displacement of air by a blade and of turbulence at the blade surface. LFNs contribute to the overall audible noise but also produce a seismic characteristic which is why people can say they can "feel" the noise.[18]

Body vibration exposure at seemingly low frequencies from 1-20 Hz can have the following effects:[19]

- General feeling of discomfort 4-9 Hz
- Head symptoms 13-20 Hz
- Influence on speech 13-20 Hz
- Lump in throat 12-16 Hz
- Chest pains 5-7 Hz
- Abdominal pains 4-10 Hz
- Urge to urinate 10-18 Hz
- Influence on breathing 4-8 Hz

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13 Ibid.
14 Dr. Amanda Harry M.B.Ch.B., P.G. Dip.E.N.T., *Wind Turbines, Noise and Health*. February 2007.
15 Ibid.
16 Ibid.
17 Ibid.
18 Ibid.
19 Ibid.

Over time, symptoms from LFN can have serious adverse physiological effects.[20]

- After 1-4 years: slight mood swings, indigestion, heartburn, mouth/throat infections, and bronchitis.
- After 4-10 years: chest pain, definite mood swings, back pain, fatigue, skin infections, inflammation of stomach lining, pain and blood in urine, conjunctivitis, and allergies.
- After 10 years: psychiatric disturbances, hemorrhages, varicose veins, hemorrhoids, duodenal ulcers, spastic colitis, blindness, headaches, severe joint pain, intense muscular pain, and neurological disturbances.

LFN intensity is subject to the sudden variation in air flow. LFN also modulates well-audible, higher frequency sounds and thus can create periodic sound. The effect is stronger at night – sometimes up to 15-18dBs higher – because of atmospheric differences. Multiple turbines can interact with each other to multiply the effect – which will be greater for larger, more modern turbines.[21]

Because the wind is inconsistent, so too will be the noise (and thus health effects) caused by wind turbines.[22]

Noise and "flicker" at nearby residences often affect the occupant's health.[23]

One particular case has generated substantial press. The d'Entermont family home is in the midst of a 17-turbine wind farm. Soon after the turbines began operating, they started feeling irritation that caused noticeable shifts in their six children's behavior. They started hearing ringing in the ears, loss of concentration, and high blood pressure. They had to move 30 miles away to resolve the health issues, and no one will buy their home.[24]

However, these symptoms don't affect everyone. As a result, the wind energy industry ignores such health claims by leaning on acoustics consultants who base their conclusions on engineering principles instead of on audiologists and physicians who study the effect of sound and vibration on people.[25]

Likewise, many environmentalists dismiss any health effects – claiming they're fictitious beliefs fueled by not-in-my-backyard-ism.[26]

The French National Academy of Medicine has warned that the harmful effects of sound related to wind turbines are insufficiently assessed. They consider wind turbines to be industrial installations and to comply by that fact to specific regulations that take account of the harmful effects of sound as particularly

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20 Ibid.
21 Ibid.
22 Ibid.
23 Gleen Schleede, *Investment in Wind Yields Negligible Environmental Benefits***.** Energy Market & Policy Analysis, Inc. Date Unknown.
24 David Rodenhiser, *N.S. Goes Green, but at What Cost? In remedying one problem, we shouldn't ignore signs we're creating another***.** The Daily News, September 23, 2007.
25 Ibid.
26 Ibid.

produced by these structures.[27]

Health Solutions

The international community recommends generous setbacks be given to property owners from wind farms in order to mitigate any potential health effects and loss of property values. The setbacks range from a minimal 1,500-foot setback[28] to 1.5 miles away from any home, school, or business.[29] Because symptoms can be suffered up to a mile from the wind farm, one study suggests that turbines should be no closer than 1.5 miles from a residence.[30] Some recommend an immediate and mandatory minimum buffer of 2km between a dwelling and an industrial wind turbine and with greater separation from a dwelling for a wind turbine with greater than 2MW installed capacity.[31]

One solution is to filter inverters at each turbine; bury all collector lines; filter the power at the substation before going to the grid, and install a proper neutral system to handle the high-frequency return current.[32]

Local governments are advised to establish beyond reasonable doubt that the families' right to respect for their homes and their private lives is not violated. If the State decides that the public interest in building wind turbines is greater than the individual private interest, then the violation is not proportionate without compensation for the individual.[33]

Wind Turbine Hazards

Turbines, like all machines, have weaknesses and are subject to accidents and failure. Inclement weather and strong gusts can snap off wind tower blades;[34] ice can build up on the blades, break, and throw large ice chunks[35] and fling ice shards onto nearby homes,[36,37] potentially harming nearby residents;[38]

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27 Keith Sterling, MA, MNIMH, Dip. Phyt., MCPP, *Calculating the Real Cost of Industrial Wind Power: An Information Update for Ontario Electricity Consumers.* Friends of Arran Lake Wind Action Group, November 2007.
28 *Report from the Bethany Wind Turbine Study Committee***.** January 25, 2007.
29 Nina Pierpont, MD, PhD, *Wind Turbine Syndrome: Testimony before the New York State Legislature Energy Committee***.**
30 Dr. Amanda Harry M.B.Ch.B., P.G. Dip.E.N.T., *Wind Turbines, Noise and Health.* February 2007.
31 Barbara J. Frey, BA, MA and Peter J. Hadden, BSc, FRICS, *Noise Radiation from Wind Turbines Installed Near Homes: Effects on Health – With an annotated review of the research and related issues.* February 2007, June 2007.
32 Catherine Klieber, *Modern Wind Turbines Generate Dangerously "Dirty" Electricity.* Dirtyelectricity.ca. April 28, 2009.
33 Barbara J. Frey, BA, MA and Peter J. Hadden, BSc, FRICS, *Noise Radiation from Wind Turbines Installed Near Homes: Effects on Health – With an annotated review of the research and related issues*. February 2007, June 2007.
34 Alastair Taylor, *Wind Turbine Smashed…By Wind***.** The Sun (UK). June 28, 2008.
35 *Report from the Bethany Wind Turbine Study Committee***.** January 25, 2007.
36 Kirsten Beacock *, Wind Turbine's Deadly Ice Shower*. The Evening Telegraph (UK). December 2, 2008.
37 Tom Hewson, *Wind Power Siting Issues Overview*. Presented to the National Association of Attorney Generals Wind Energy Facility Siting Issue Panel. April 21, 2008.
38 Eleanor Tillinghast, *Wind Turbines Don't Make Good Neighbors: Some Problems of Wind Power in the Berkshires.* Study presented by Green Berkshires, Inc. May 14, 2004.

turbulent wind can accelerate a blade's deterioration, weakening it to the point of breaking off and crashing into nearby homes;[39] high winds can also overpower its automatic braking system and result in structural failure; [40] automatic shut-down systems can malfunction, damaging the turbine to the point of collapse;[41] and gale force winds can shut down turbines and make them a safety concern. In one such case, British police cordoned off a 1,500-foot area around the wind farm for "safety precautions."[42] Other common problems include fires and blade disintegration caused by mechanical failures and lightning.[43]

In Europe, which has long had wind farms, turbines are seeing a spike in accidents, defects, and needed repairs. A turbine's gearbox is expected to last 5 years and often quits before then. Due to the huge demand for turbines, manufacturers have no time to test their product before sending it into the field. This demand has so strained manufacturing capabilities that the waiting list for replacement parts can sometimes top 18 months – leaving the turbine motionless the whole time.[44]

Wind farms interfere with weather radar by sending false storm signals,[45] thus limiting the ability of surrounding areas to know if they should seek shelter or not. They also interfere with military radar, affecting military readiness.[46] And they may interfere with civilian radar,[47] making it very dangerous to site turbines near airports or military installations.[48]

Despite the constant warning lights on top of each turbine, wind farms are dangerous to planes. A distance of 1,200 feet is still too close to an airport or landing strip because it's impossible for aircraft to turn fast enough to avoid the turbines. Also, turbines create a downdraft – additional turbulence that pilots have to overcome in takeoffs and landing.[49]

Wind farms can also constitute a nuisance to nearby landowners. Even though the State Public Service Commission approved the facility, such approval did not overrule the common law of nuisance. Accepted causes of nuisance include noise, eyesore, flicker, and strobe effect of light reflecting from blades, potential danger from broken blades, ice throws, and reduced property values.[50]

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39 Michael Connellan, *Spinning to Destruction***.** The Guardian (UK). September 4, 2008.
40 *Report from the Bethany Wind Turbine Study Committee.* January 25, 2007.
41 Jason Lehmann, *Faulty Wiring Likely Caused Wind Turbine Collapse at Altona Wind Farm*. SNL Interactive. March 10, 2009.
42 Natalie Chapples, *Exclusion Zone around Wind Farm after Gales***.** North West Evening Mail (UK). March 12, 2008.
43 Gleen Schleede, *Investment in Wind yields Negligible Environmental Benefits.* Energy Market & Policy Analysis, Inc., Date Unknown.
44 Simone Kaiser and Michael Frohlingsdorf, *The Dangers of Wind Power.* BusinessWeek, August 24, 2007.
45 Scott Williams, *Wind Turbines Complicate Wind Monitoring***.** The Journal Sentinel, April 11, 2009.
46 Author Unknown, *Energy Law Alert: Department of Defense Issues Report on Effects of Windmills on Radar***.** Stoel Rivers, LLP – Attorneys at Law, October 19, 2006.
47 *Wind Power Siting Issues Overview***.** Tom Hewson. Presented to the National Association of Attorney Generals Wind Energy Facility Siting Issue Panel, April 21, 2008.
48 Eleanor Tillinghast, *Wind Turbines Don't Make Good Neighbors: Some Problems of Wind Power in the Berkshires.*
49 Chris Luxemburger, *Living with the Impact of Windmills***.** Date appx. between 2008 & 2009.
50 *Contracting Legal Issue***s.** Erin C. Herbold, staff attorney, ISU Center for Agricultural Law and Taxation. North Central Risk Management Education Center, May 14, 2009.

Conservation Concerns

Even conservation groups are divided on Wind Energy. In North Carolina, environmentalists are fighting over siting issues. Some environmentalists and the wind companies want to place turbines on mountain ridges for optimal winds. But other environmentalists want them off the ridges in order to protect the mountains' natural beauty.[51]

Conservation groups are concerned about the impact of wind farms on birds. Poor siting has led to bird and bat fatalities.[52] According to the American Bird Conservancy, wind towers kill 10,000 to 40,000 birds every year. However, this is still much lower than the 100 million window-related bird deaths each year.[53] Bats, however, are killed three times as much as birds by wind turbines.[54] And many bats killed by turbines are most likely migrating for mating rituals. If such bats are killed then certain bat species are in danger of failing to repopulate.[55] According to industry advocates, the most damage to wildlife and plant-life happens during construction. After construction, collision consequences are insignificant compared to the effects of other man-made structures, vehicles, and pollution.[56]

Promoters routinely ignore wind development environmental damage. Electricity from the wind is not environmentally benign. Wind plants adversely affect a wide variety of environmental, ecological, and scenic values including bird kills and interference with migration patterns.[57] And construction disruptions are extensive and turbine installation can significantly affect natural drainage and groundwater.[58]

Property Values and Land Use

Industry advocates say little about a turbine's aesthetic impact. When they do mention property values, they deny that wind farms negatively impact property values. They say property value fears are exaggerated and if they do admit impact, they say the only effect would be more time on the market for sales to be completed.[59] One utility president went so far as to claim that those who claim property

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51 Jack Betts, *Wind Farms on Ocracoke? Nope***.** This Old State (blog), July 15, 2009.
52 Tom Hewson, *Wind Power Siting Issues Overview.* Presented to the National Association of Attorney Generals Wind Energy Facility Siting Issue Panel, April 21, 2008.
53 Caleb Hale, *Wind Turbines and Migratory Birds: A serious problem?* The Southern (IL), May 23, 2009.
54 Ibid.
55 Paul Cryan, *Bat Fatalities at Wind Turbines: Investigating the Causes and Consequences***.** United States Geological Survey Fort Collins Science Center. Date unknown.
56 *Permitting of Wind Energy Facilities: A Handbook (Revised 2002).* National Wind Coordinating Committee, August 2002.
57 Gleen Schleede, *Investment in Wind Yields Negligible Environmental Benefits***.** Energy Market & Policy Analysis, Inc. Date Unknown.
58 *Report from the Bethany Wind Turbine Study Committee,* January 25, 2007.
59 Bob Shaw, *Developers Balking at Proposed Woodbury Wind Turbine.* Pioneer Press, September 24, 2008.

value diminutions "pull myths out of thin air and persist in wild accusations despite being debunked."[60] To prove this point, industry advocates frequently refer to the following studies:

- Relationship between Wind Turbines and Residential Property Values in Massachusetts: A Joint Report of University of Connecticut and Lawrence Berkeley National Laboratory by Carol Atkinson-Palombo and Ben Hoen (2014)
- The Windy City: Property Value Impacts of Wind Turbines in an Urban Setting by Corey Lang, James J. Opaluch, and George Sfinarolakis (2014)
- The Effects of Wind Turbines on Property Values in Ontario: Does Public Perception Match Empirical Evidence? by Richard Vyn and Ryan McCullough (2014)
- The Effect of Wind Development on Local Property Values by the Renewable Energy Policy Project (REPP) (2004)

The 2014 Ben Hoen study analyzed more than 122,000 home sales, between 1998 and 2012, that occurred near the current or future location of 41 turbines in densely populated Massachusetts' communities. The study determined that wind turbines do not have a negative impact on property values in urban settings. It was an update of his 2009 study. Funding for the study was provided by the Massachusetts Clean Energy Center and the U.S. Department of Energy Wind & Water Power Program within the Office of Energy Efficiency and Renewable Energy.[61]

The 2014 Rhode Island study analyzed 48,554 single-family, owner-occupied transactions within five miles of a turbine site, including 3,254 within one mile. The authors concluded that wind turbines have no statistically significant negative impacts on house prices. Funding for the study was provided by Rhode Island's Office of Energy Resources, University of Rhode Island's Coastal Institute, and Rhode Island Agricultural Experiment Station.62

In the 2014 study from Vyn and McCullough, the authors analyzed 7,000 home and farm sales in and around Melancthon Township – home to one of Ontario's first and largest wind farms (113 turbines). They concluded that wind turbine developments have no effect on property values.63

The 2004 study was performed by the Renewable Energy Policy Project (REPP) – an organization dedicated to accelerating the use of renewable energy, reviewed assessed values of property sales within 5 miles of wind projects from 1998-2001 to determine if there was a negative effect on property values within the viewshed of the wind farm projects. In 9 out of their 10 case studies, they found either no change in value or even an increase in value resulting from being in the turbines' view shed than those outside of it.[64]

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60 Mike Sagrillo, *Residential Wind Turbines and Property Values***.** Sagrillo Power & Light Co. American Wind Energy Association website, 2004.

61 Carol Atkinson-Palombo and Ben Hoen, *Relationship between Wind Turbines and Residential Property Values in Massachusetts: A Joint Report of University of Connecticut and Lawrence Berkeley National Laboratory*. January 9, 2014.

62 Corey Lang, James J. Opaluch, George Sfinarolakis, *The Windy City: Property Value Impacts of Wind Turbines in an Urban Setting*. Energy Economics. Volume 44, July 2014.

63 Richard Vyn and Ryan McCullough of The University of Guelph*, Wind farms to do not affect property values, study finds*. Canadian Journal of Agricultural Economics, December 8, 2014.

64 George Sterzinger (REPP Exec. Dir.), Fredric Beck (REPP Research Manager), Damian Kostiuk (REPP Research & Communications Specialist), *The Effect of Wind Development on Local Property Values.* Prepared for the Renewable Energy Policy Project (REPP), May 2003.

However, the remarkable conclusion that property values increased isn't verified.[65] They did not follow up with the property purchasers, thus invalidating their conclusion.[66] The REPP findings surprisingly omit many necessary variables for analysis such as adjustments for a rising or falling market, number of days from listing to sale, residential property vs. rural property, effect of noise, flickering and shadows, distances of the homes from the turbines, and possible change in highest and best use due to the presence of the turbines.[67] And anyone who has ever owned a home or property knows that assessed values rarely reflect a property's market value.

The study also fails to analyze whether or not the properties had a direct line to the turbines, and they also failed to incorporate distance from the wind farms as a variable. Curiously, the number of property transactions decreases the closer one approaches the wind farm. By only examining change in comparable property values over a three-year period, the study weakens itself because, in most cases, the projects had been announced and debated long before the three-year window opened. As a result, any depressive effect on property values would have occurred prior to the start of the study. The REPP study also did not look at other indices of real estate value, such as rising or falling inventory values, or the number of days from listing to sale.[68]

In reality, close proximity to wind turbines can devalue a property 20-30%.[69] And even townships widely disregard the REPP study for its wind energy bias, its incomplete data, and its deeply flawed methodology.[70] [71]

Shortly after the University of Guelph study was published, real estate professionals strongly criticized its findings that wind turbines do not impact nearby property values.72 Interviewed professionals shared how wind turbines impact property values:

- "I have had several deals fall apart in this area because, in the appraisal report, it has been mentioned that there are windmills visible or adjacent to the property."73
- "Turbines complicate your property enjoyment, period. That alone spells depreciated value(s)."74

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65 Richard Light & Molly Hyde, *Introduction to Research on Property Value Impacts.* Centerville Township, Michigan, August 2006.
66 Ibid.
67 Derry T. Gardner, *Impact of Wind Turbines on Market Value of Texas Rural Land.* Gardner Appraisal Group, Inc. February 13, 2009.
68 Richard Light & Molly Hyde, *Introduction to Research on Property Value Impacts.* Centerville Township, Michigan. August 2006.
69 Kevin Sampler, *Wind Farm Opponents Air Concerns; Experts say Rail Splitter project will create noise, affect property values.* Journal Star, May 2, 2008.
70 Richard Light & Molly Hyde, *Introduction to Research on Property Value Impacts***.** Centerville Township, Michigan. August 2006.
71 Ibid.
72 *Industry criticizes wind turbine report*. Jennifer Paterson. Canadian Real Estate Wealth. December 18, 2014.
73 Ibid.
74 Ibid.

- "If you were to buy your future home, given the choice, would you buy where you would have noise, shadow flicker, an industrial view, potential health issues caused by the turbines, and the possibility of a very difficult resale, or would you spend your money elsewhere?"75

Other university-led studies, such as these three published within one year of each other, found different results:

- A 2010 study by Illinois State University used 3,851 residential transactions from January 1, 2001, through December 1, 2009, from McLean and Ford Counties, Illinois to see whether proximity to a 240-turbine wind farm impacts nearby residential property values. They found "some evidence that supports wind farm anticipation stigma theory, and the results strongly reject the existence of wind farm area stigma theory."76
- A 2011 study by Illinois State University looked at sales across a 13-year period to see if the Mendota Hills Wind Farm in Lee County, Illinois impacted the average selling price of nearby residential real estate. The study's author concludes that it does not. Further, he states that the wind farm significantly increased the selling values of nearby residential properties.77
- A 2011 study by Clarkson University looked at 11,369 property transactions over 9 years in Northern New York to see if new wind facilities affected property values. The author found that "nearby wind facilities significantly reduce property values. Decreasing the distance to the nearest turbine to 1-mile results in a decline in price of between 7.73% and 14.87%."78

Industry advocates often liken wind turbines to other man-made structures like water towers.[79] But water towers don't move.[80] If they had no effect, then people would want to live near them. However, developers are balking at even building near wind turbines lest potential buyers of high-end homes be "spooked by the noise and visual distraction of the huge whirling fan blades."[81]

In reality, value comes down to location, location, and location. If an individual is given two identical homes, but one has a wind turbine and the other does not, common sense (and research) shows the house without the turbine will be purchased first. In many cases, there is a complete lack of interest in any homes near existing or planned wind farms. And when they do sell, they usually sell at less than current market value.[82]

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75 Ibid.
76 Jennifer L. Hinman, *Wind Farm Proximity and Property Values: A Pooled Hedonic Regression Analysis of Property Values in Central Illinois*. Illinois State University, May 2010.
77 Jason Carter, *The Effect of Wind Farms on Residential Property Values in Lee County, Illinois*. Illinois State University, Spring 2011.
78 Martin D. Heintzelman and Carrie M. Tuttle, *Values in the Wind: A Hedonic Analysis of Wind Power Facilities*. Economics and Financial Studies School of Business at Clarkson University, March 3, 2011.
79 Mike Sagrillo, *Residential Wind Turbines and Property Valu***es.**
80 Bob Shaw, *Developers Balking at Proposed Woodbury Wind Turbine***.**
81 Ibid.
82 Julian Davis BSc & Jane Davis M.A., *Property Values and House Prices: Appendix 1 of the Report to the Select Committee on Economic Affairs,* June 2008.

Devaluation also affects what people are willing to pay to rent vacation property near wind farms. In 2017, a choice-experiment was conducted with people who had recently rented a vacation property along the North Carolina coastline to assess the impacts of a utility-scale wind farm on their rental decisions. Visualizations were presented to survey respondents that varied both the number of turbines and their proximity to shore. They found the following:

- No respondents would be willing to pay more to rent a home with turbines in view.
- Many said they would change their vacation destination if wind farms were placed within view.
- A discount of 5% or more was required to attract respondents most amenable to viewing a utility-scale wind farm within eight miles of shore.83

Even when turbines are offshore, seeing them can impact property values. In Henderson, New York, a study of a proposed 31-turbine, 102.3-megawatt project found that the project's 575-foot turbines would be visible from a 15-mile radius, negatively impacting the value of waterfront properties from $11,300 (low estimate), $33,200 (central estimate) and $53,900 (high estimate). The estimates were based on the 15% value depreciation of properties with a view of the nearby Wolfe Island turbines in Ontario, Canada.84

When another wind farm was announced in addition to the one at Wolfe Island, waterfront property values started to slide. By the time the additional project was scrapped five years after being announced, waterfront homes were selling up to $300,000 less than they were before the project. Though buying has started to rebound, properties are being sold for hundreds of thousands below asking price, and properties take years to sell instead of months.85

The wind company proposing the Henderson wind farm contested the town's study that estimated a loss of $40 million in property values. They claim the study used flawed methodology – specifically regarding the distance of the project from the mainland.86 If these properties' values dropped, their assessments would too, and homes without a view of the turbines "would probably see an increase in property taxes to make up for the overall drop in property values."87

As the Principal of JTC Energy Research Associates wrote for Forbes, "A piece of property, after all, is just what someone is willing to pay for it. Markets are about supply and demand, and all things being equal, why would somebody choose to buy a home with an industrial wind farm nearby? And simply put, it seems impossible to believe that wind turbines would actually add to a property's value."88

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83 Sanja Lutzeyer, Daniel J. Phaneuf, Laura O. Taylor, T*he Amenity Costs of Offshore Wind Farms: Evidence from a Choice Experiment*. Center for Environmental and Resource Economic Policy – NC State University, August 2017.
84 Ted Booker, *Clarkson study: Henderson could lose $40 million in property value from Galloo Island wind project*. Watertown Daily Times, April 5, 2016.
85 Ted Booker, *Realtors say Wolfe Island wind turbines caused waterfront home prices to plummet*. Watertown Daily Times, June 1, 2014.
86 Ted Booker, *Wind developer: Study erroneously predicted turbine impact on Henderson*. Watertown Daily Times, April 17, 2016.
87 Ted Booker, *Clarkson study: Henderson could lose $40 million in property value from Galloo Island wind project*. Watertown Daily Times, April 5, 2016.
88 Jude Clemente, *Do Wind Turbines Hurt Property Values?* Forbes.com, September 23, 2015.

Assessors are starting to devalue homes that are at least 1,500 feet away from the nearest turbine. In one case, several residents near an industrial wind farm received up to a 10% lower property value due to their proximity to turbines. The assessors considered the turbine space an industrial area and devalued nearby properties accordingly.[89]

In another case, Vermont homeowners living near four wind turbines appealed their assessment due to excessive noise. The local Board of Civil Authority agreed and lowered the assessed value on the $400,000 home by more than $50,000.90 91

In Ontario, property assessments near a wind farm were reduced from -$101,000 on the low end, to -$143,000 on the high end.92

In New York, a homeowner appealed his 25-acre property assessment due to neighboring wind turbines. The assessor lowered the assessment by 60%.93

In Vermont, contention arose between landowners and assessors. Landowners said nearby turbines' noise devalued their land, but the assessors rejected their claims. The wind farm developers also resisted their claims on the basis of academic and government studies that showed no impact on property values. However, the Board of Civil Authority reconsidered the claims and reduced the assessments by 8-15%.94

Wind farm developers like to promote the idea that while their wind farms may cover a very large area, they only physically occupy 3-5% of the total land area for the towers, associated structures, and access roads. They claim the rest of the land is left largely undisturbed and "available for continued use by the landowner."[95]

However, turbines come with many use restrictions.

Even though a minority may find windmills to be a nuisance, property values can still drop $2,900 per turbine up to $16,000 for a property abutting 12 turbines.[96]

In testimony before the Livingston County Zoning Board of Appeals (Illinois) regarding a wind farm, Appraiser Michael McCann shared that properties within 3 miles of wind turbines sell at 25% less

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89 *Wind Farms Lower Property Assessments in Western P.E.I.* CBC News, December 23, 2008.
90 Alexei Rubenstein, *Vermont wind farm blows down home values*. WCAX.com. October 15, 2013 (Updated October 17, 2013).
91 Terri Hallenbeck, *Town listers become next arbiter in Vermont's debate over wind*. Burlington Free Press, October 26, 2013.
92 *Wolfe Island property assessment reductions of over $3 million*. Ontario Wind Resistance. September 19, 2012.
93 John Servo, *Tax Assessment Lowered 60% due to Adjacent Wind Turbine Site*. Cohocton Wind Watch, August 31, 2009.
94 Matthew Preedom, *Wind Turbines: Do property values fall?* St. Albany Messenger, August 17, 2015.
95 *Permitting of Wind Energy Facilities: A Handbook (Revised 2002).* National Wind Coordinating Committee, August 2002.
96 David C. Maturen of Maturen & Associates, Inc., *RE: Impact of Wind Turbine Generators on Property Values.* September 9, 2004 (e-mailed letter). Study referenced within text: Social Assessment of Windpower – Visual Effect and Noise from Windmills – Quantifying and Evaluation.

compared to control sales more than 3 miles away.97

As with other easements, some claim that the impact from windmills will diminish over time. However, studies from Europe show otherwise. In Germany, which has long had windmills, real estate agents report property value losses between 20-30% for properties in sight of wind farms.[98]

Likewise, Scottish real estate agents found that a 41-turbine wind farm would result in $1 million in property value losses.[99]

Further, hundreds of homeowners in Scotland fear they have lost vast sums of property value due to nearby turbines. In one example, a cottage lost 50,000 pounds of value because of a planned wind farm half a mile away. Real estate agents are advising sellers to automatically lower their asking price by 30%, but some still can't sell.100

Another Scottish homeowner put her home on the market after learning of a proposed wind farm less than 500 years from her residence. After two years, she was unable to find a buyer. One potential buyer withdrew her offer, citing a conversation with the town's planning council that told her the turbines will cause "a whooshing noise and flicker." Her cottage was originally valued at 130,000 pounds before the wind farm, but then the valuation was lowered to 100,000 pounds after it was built. She eventually sold the cottage for 85,000 pounds.101

In the UK, property experts say wind farms can reduce the value of homes by up to 8%.102

In England and Wales, a study found that large wind farms (20+ turbines) reduce prices by 12% within 2km. Averaging wind farms of all sizes, the study found the price reduction from wind turbines to be 5-6% within 2km, less than 2% between 2 and 4km. There are small (~2%) increases in neighboring prices where the wind farms are not visible, although these are only statistically significant in the 4-8km area. The author suggests, "These offsetting price effects in neighboring places where wind farms are visible and where they are not may explain, in part, why previous studies that focus only on distance to wind farms fail to find significant effects."103

The author further explains, "These findings are comparable to the effects of coal power plants in the US found in Davis (2011) who finds up to 7% reduction within 2 miles (3.2 km). It takes many geographically dispersed wind farms to generate the same power as a single coal (or nuclear) plant, so the aggregate effects of wind farms and the number of households affected by their visual impact is likely to be

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97 Cynthia Grau, *Experts offers insight to wind farm questions*. Pontiac Daily Leader, February 11, 2015.
98 David C. Maturen of Maturen & Associates, Inc., *RE: Impact of Wind Turbine Generators on Property Values.* September 9, 2004. (e-mailed letter.) Study referenced within text: Strutt & Parker study of the Edinbane Windfarm on the Isle of Skye.
99 Ibid.
100 *Wind farm misery for property owners*. The Sunday Post, September 29, 2013.
101 Ben Borland, *Proof windfarms will cut Scots house prices*. Express, September 8, 2013.
102 Alice Philipson, *Wind farms knock eight per cent off average home value, property experts reveal*. The Telegraph. October 31, 2013.
103 Stephen Gibbons, *Gone with the wind: valuing the visual impacts of wind turbines through house prices*. Journal of Environmental Economics and Management. March 2015.

considerably larger."104

In the UK, a couple successfully sued their conveyancer for "a substantial compensation settlement" for not disclosing plans that a wind farm was to be constructed less than a mile away and that the turbines would be visible from the property. The couple said, had they known about the wind farm, "they would have reconsidered their offer."105

In a landmark case, a UK court agreed with a couple that argued that ten 360-foot-tall wind turbines ruined their quality of life. The company responsible for the turbines has to remove them at their expense and pay large fines and legal expenses.106

The effect of wind farms on property values ultimately "forced" the UK's Valuation Office Agency to rebrand homes near wind farms into lower tax categories. In one case, a property owner saw the value of their home fall 25% because it is 650 yards from a turbine.107

In Denmark, so many landowners were concerned about lost property valued due to neighboring wind turbines that a "loss-of-value" clause was passed by their parliament in 2008. It allowed landowners to seek financial compensation for lost property values. Those applicants who received compensation (average of 57,000 kroner per household (~$7,000) said it "did not come close to reflecting the actual value." Further, "Estate agents say the amount is often far below the actual property value loss, which in some cases is up to 20 percent."108

Property value concerns due to neighboring wind farms are so widespread that property value guarantee agreements are being included in government ordinances nationwide from New York to North Carolina, Illinois, Maine, New Hampshire, and Michigan. For example, voters in the Newfound region of New Hampshire passed wind-related articles by as much as five to one. One of them would require wind developers to guarantee the property value of any home within a 3-mile radius of a wind farm. It deterred the developer of a small 3-turbine operation.109

The Board of Zoning Appeals in Tipton County (Indiana) approved a conditional use permit for a proposed wind farm with conditions requiring a 1,500-foot setback from property lines and a property value guarantee to "protect non-participating property owners in the project area." The wind farm company submitted a plan that limited their liability to $1 million. However, the company is planning on contesting the property value guarantee as a condition.110

Other wind energy companies are resisting such guarantees. For example, the Town of Hammond, New

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104 Ibid.
105 Joanne Atkin, *Compensation for couple after conveyancer fails to find wind farm*. Mortgage Finance Gazette. March 9, 2015.
106 Peter Allen, *Couple win landmark battle to have 10 wind turbines taken down because they spoil the view from their dream home in France*. The Daily Mail, November 7, 2013.
107 Gerri Peev, *Wind farms DO hit house prices: Government agency finally admits that thousands can be wiped off value of homes*. The Daily Mail, July 22, 2012.
108 *Wind turbine compensation stirring discontent*. The Copenhagen Post. November 12, 2012.
109 Sam Evans-Brown, *Newfound Area Voters Again Show Distaste For Wind Power At Town Meeting*. New Hampshire Public Radio, March 12, 2014.
110 Ken de la Bastide, *Prairie Breeze Wind Farm fight headed to court*. Kokomo Tribune, August 30, 2013.

York, proposed a wind law that requires a wind farm company to compensate property owners who cannot get the appraised value of their home at sale because of the presence of wind turbines. If passed, the company says it will scrap plans to build a proposed wind farm.111

In Ontario, Canada, a high court determined that landowners living near "industrial wind turbine projects" do lose property value. The court further accepted that 22% to 55% loss of property values is occurring.112 In a case study of two areas in Ontario with wind turbines, the author concludes, "Real or perceived nuisances resulting from wind turbines produce buyer resistance that results in price diminution" of 22.47% on the low end to 55.18% on the high end.113 In another case, a member of the Multi-Municipal Wind Turbine group said an assessment of property values confirmed a 25% devaluation due to industrial wind turbines.114 Elsewhere in Canada, landowners in Alberta are opposing plans to build 83 turbines near their properties. To protect their property values, they want the county to implement a 1.5 km setback instead of the proposed 500 meters.115

The effect of wind farms on property values is also a concern in Australia. Rural landholders are worried they may face fewer buyers and devaluations of up to 60% because of neighboring wind farms.116 Elsewhere in Australia, a resident in a community selected for a proposed wind farm said he will sue any of his neighbors who host a turbine on their property because doing so would diminish his property. Lawyers said there was extensive precedent backing his claim of right to damages from turbine noise nuisance.117

The township of Lincoln in Kewaunee, WI performed its own study and found that sales within one mile of the wind farm prior to installation were 104% of the assessed values. Properties selling after the wind farm installation in the same area were at 78% of the assessed value.[118] The UK has reported similar impacts up to a 20% loss in value from the presence of four 360-foot tall turbines 550 yards from a new home.[119]

In some coastal areas with turbines, affluent properties have lost up to a third of their value. However, in rural farming areas, prices remained steady or even increased from the associated income stream from the turbines.[120]

Wisconsin residents fear the impact large wind farms can have on lowered property values. Their fear is justified by a plethora of independent studies and reports that all find the same thing: Wind farms have a

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111 Matt McAllister, *Iberdola Threatens To Leave*. The Journal, December 8, 2010.
112 Amanda Brodhagen, *Ontario court says wind turbines reduce property values*. Farms.com, April 24, 2013.
113 Ben Lansink, *Diminution in Price, Melancthon & Clear Creek Conclusions*. February 2013.
114 Janice Mackay, *Wind Turbine Group Told of Falling Property Values*. BlackburnNews.com, October 13, 2015.
115 Lisa Joy, *Wind turbines affect property values*. The Stettler Independent, April 29, 2018.
116 Matthew Cranston, *Wind farms win few fans*. The Australian Financial Review, October 14, 2013.
117 Hamish Boland-Rudder, *Threat of legal action against wind farm hosts*. The Canberra Times, October 29, 2013.
118 David C. Maturen of Maturen & Associates, Inc., *RE: Impact of Wind Turbine Generators on Property Values.* September 9, 2004. (e-mailed letter.) Study referenced within text: Strutt & Parker study of the Edinbane Windfarm on the Isle of Skye.
119 Ibid.
120 Marius Cuming and Lucy Skuthorp, *Wind Farms Change Land Values***.** National Rural News (Australia), November 11, 2008.

negative effect on property values.[121]

Properties within wind farm areas may experience longer days on market. One study of 600 sales over 3 years within proximity of a windmill found that the days on market were more than double for properties within the windmill zone. The selling price was an average of $48,000 lower inside the zone than outside. And 11% of homes within the zone did not sell vs. 3% of homes outside the zone.[122]

At a wind forum held in Grafton, VT, concerned residents discussed the environmental and residential impacts of a proposed wind farm. A representative of a company that specializes in high-end homes and country estates said it was difficult to sell a 40-acre, 5,500 sq. ft. home once the wind project was announced. The property was valued at $2.2 million but sold for $1.25 million. The representative said, “People don't come to Vermont to look at wind farms and they don't come to Vermont to hear a lot of noise. So, these are direct impacts on the values."123

Even residents in desert regions are concerned about property values. Residents in a desert region of Nevada popular with retirees and tourists are worried that the installation of 428-feet-tall wind turbines will diminish property values. Residents are familiar with value studies and sound assessments that highlight unforeseen impacts arising from wind turbines near residences.124

Wind farms are normally built in rural locations. Therefore, apart from accommodation size, important influences on value will often be the view, the peace and serenity, and a rural environment. In many rural locations, a wind farm will reduce the value of properties located nearby. But as the distance between wind turbines and dwellings increases, the valuation impact is lessened, and the prospect of consequent health problems is reduced. A part of the loss in value will be attributable to the loss of a quality view. However, a substantial apportionment of the loss in value flows directly from the environmental noise pollution and the consequent health impact. A smaller part of the loss will be due to the rotation of the turbine blades, which in certain circumstances will cause strobing light/shadow flicker (which can have health repercussions). In a high-value area of the country, the potential valuation impact is likely to be higher.[125]

In most cases, environmental noise pollution will influence the bulk of property damages. In a well-populated rural area, the cumulative financial damage (the loss imposed on the community) will substantially exceed the public interest that will be served from the wind farm.[126]

Wind farms have significant adverse impacts on environmental, ecological, scenic and property values. The drop in real estate values of neighboring homes is an unfair burden to those who have chosen to live or retire to the country. The value of a farmhouse may be affected by as much as 30% if it is in close

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121 Richard Mertens, *In Wisconsin, Tilting at Windmills Is a Serious Matter***.** The Christian Science Monitor, April 25, 2005.
122 Chris Luxemburger, *Living with the Impact of Windmills.* Date appx. between 2008 & 2009.
123 Brandon Canevari, *Wind concerns addressed at Grafton forum*. Manchester Journal, February 24, 2014.
124 Kyle Gillis, *Searchlight wind farm could reduce property values by 25-60 percent, suggest studies*. Nevada Journal, April 2, 2013.
125 Barbara J. Frey, BA, MA and Peter J. Hadden, BSc, FRICS, *Noise Radiation From Wind Turbines Installed Near Homes: Effects On Health – With an annotated review of the research and related issues,* February 2007, June 2007.
126 Ibid.

proximity to a wind turbine.[127]

One British study of 919 home sales within 5 miles of a wind farm found no impact from wind turbines on property value.[128] However, the turbines were small. Their maximum height was just over a third (48m) of turbines being currently built. No account was taken of whether the properties concerned had views of the turbines. They lumped all distance zones and rural and town properties into one big pot without differentiating them. There was no before-and-after analysis of sale prices.[129] Curiously, when interviewing general agents, they found 60% said that proximate wind farms would decrease property values in the viewshed, 67% believe depreciation starts at the planning stages and lessen with time.[130]

The "threat" of a wind farm may have a more significant impact than the actual presence of one. Wind farm developers in the UK are purposely avoiding populated areas in order to mitigate property value-based opposition.[131]

Concerned about the impact wind turbines may have on local property values, two members of the Centerville Township in Michigan conducted a literature review of four available studies on the subject. The township committee found that it is reasonable to conclude that the presence of wind turbine generators near residential houses causes property values to decline and further impact on property values depends on location. "This is common sense, and there are no serious scholarly studies that support an opposite conclusion." Large wind turbines can affect neighboring property values due to noise, health effects, and visual impacts on residents. Some homes have been reported as "not salable" because of WTG proximity. These adverse impacts on property values may not exist in agricultural areas that have huge farms. If the land is being sold as fertile farmland then the presence or absence of a nearby wind turbine is probably irrelevant. If there is a chance that a future wind turbine might be placed on the farmland, a potential buyer might think the land was slightly more valuable. However, though the lessee may slightly benefit, large wind turbines can also affect neighboring property owners who receive nothing because the turbine isn't on their land. A town real estate agent lost a large vineyard sale within the township because the proposed wind farm was seen as a detriment to potential buyers.[132]

"The locating of a WTG near a residential house can, at best, have no effect on the value and salability of the house. But logically, as wind turbines are larger and larger, in some cases 400 feet tall, and as they produce constant audible noise over a large area, as they intrude on the viewshed, the only valid conclusion is that nearby residences are less valuable than they would be if there was no turbine nearby. Why would a buyer choose a house within sight and sound of a turbine, if a comparable house at the same

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127 Keith Sterling, MA, MNIMH, Dip. Phyt., MCPP, *Calculating the Real Cost of Industrial Wind Power: An Information Update for Ontario Electricity Consumers*. Friends of Arran Lake Wind Action Group, November 2007.
128 Peter Dent and Dr. Sally Sims, *What Is the Impact of Wind Farms on House Prices?* Department of Real Estate and Construction, Oxford Brookes University, UK. Paid for by the Royal Institution of Chartered Surveyors Education Trust, March 2007.
129 *What is the Impact of Wind Farms on House Prices? An assessment of the study done in March 2007 for RICS.* I.C. Eperon, June 2008.
130 Peter Dent and Dr. Sally Sims, *What Is the Impact of Wind Farms on House Prices?* Department of Real Estate and Construction, Oxford Brookes University, UK. Paid for by the Royal Institution of Chartered Surveyors Education Trust, March 2007.
131 Ibid.
132 Richard Light & Molly Hyde, *Introduction to Research on Property Value Impacts.* Centerville Township, Michigan, August, 2006.

price were available elsewhere, beyond the sight and sound of the turbine? It is totally counter-intuitive to suggest anything else."[133]

While some may think a windmill lease on their property boosts their land value, the reality is that they also incur a higher property tax. Their property's appreciation is offset by their neighbors' depreciation. The WTG lessee incurs a higher property tax and receives annual rent for signing the lease/easement. The other landholders find their property values decreased, and they receive nothing.[134]

Though wind energy development may create an income stream, and thus increase a property's production value, that increased production value does not necessarily result in increased market value.

Real Estate brokers in rural areas confirm that property values in wind farm areas are 10-30% less than similar properties outside of wind farm areas.[135]

View adds value to rural property. That's just common sense. Take away the view, and you take away the value.[136]

Homes with a turbine within 300 feet can suffer reduced property values of up to 10%. Noise, blinking lights, glare from the blades, and vibrations all played a role in the devaluation.[137]

In Kewaunee, Wisconsin, a study paid for by a wind farm developer found no measurable differences in home values in the target areas close to the wind farms and the control areas outside of the wind farm vicinity. It found the same for a case study in Mendota, Illinois.[138]

Three years later, The Wisconsin Public Service Commission proposed new regulations that worried Realtors because the setbacks were too small from residences, noise standards were insufficient, and shadow flicker limits were inadequate.139 Five years after the PSC's proposal, The Wisconsin Realtors Association asked the state Supreme Court to invalidate a 2009 rule establishing setback requirements for building wind turbines near residential housing. The WRA said 1,250-foot setbacks aren't enough to protect housing values.140

Vermont's government wants green energy, even if it has to sacrifice its natural beauty to attain it.[141] But wind farms negatively impact pastoral beauty, driving tourists away and severely damaging their main

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133 Ibid.
134 Ibid.
135 Derry T. Gardner, *Impact of Wind Turbines on Market Value of Texas Rural Land***.** Gardner Appraisal Group, Inc., February 13, 2009.
136 Ibid.
137 Erin C. Herbold, staff attorney, ISU Center for Agricultural Law and Taxation, *Contracting Legal Issues***.** North Central Risk Management Education Center, May 14, 2009.
138 Peter J. Poletti, *A Real Estate Study of the Proposed White Oak Energy Center McLean and Woodford Counties, Illinois***.** For Invenergy Wind LLC, January 2007.
139 Tom Larson, *New Wind Farm Regulations Could Decrease Property Values*. Wisconsin Realtors Association, September 2, 2010.
140 Gilman Halsted, *Realtors Argue For Bigger Wind Turbine Setbacks*. Wisconsin Public Radio, February 6, 2015.
141 Eleanor Tillinghast, *Wind Turbines Don't Make Good Neighbors: Some Problems of Wind Power in the Berkshires***.** Study presented by Green Berkshires, Inc., May 14, 2004.

industry. [142] Supporters claim the turbines themselves will become an attraction. [143] However, empirical evidence worldwide agrees that wind farms tarnish local beauty and damage tourism. [144] Property values will also suffer up to 20% for a turbine 550 meters away. [145] "It is an incursion into the countryside. It ruins the peace." [146] Real estate agents agree. It's common sense that an industrial structure will damage what was before a naturally beautiful area. [147] Agents in Britain and Australia and the U.S.A. have found it nearly impossible to sell properties next to wind farms unless they discount it 20-30%.[148] A realtor study around Nantucket Sound found that 49% of realtors expect property values to fall in proximity to a wind farm. [149]

Two studies conducted in Nantucket, Massachusetts found that a 130-turbine offshore wind farm would drive enough visitors away to see a loss of up to 2,500 tourism-related jobs. They also found that inland property values would decline 4.6% while the waterfront properties suffer nearly 11% diminution for a total loss of $8 million in yearly tax revenue.[150]

Combining an area of natural beauty with industrial development like a wind farm will have an adverse impact on its desirability. It is not only devalued, but the property may also be rendered unsaleable. Turbines not only have a visual impact, but they also impact the quality of life. People who buy rural land typically do so to enjoy the natural views, but a wind farm within their viewshed ruins the horizon and heritage views.[151]

The scenic impact of wind plants is significant, and as valued natural landscapes disappear, more concern is apparent.[152]

Another attraction of rural land is the quiet. Buyers want someplace to get away from the noise and sounds of industry and the city. Closing the door [on a wind farm] eliminates the view, but it does not eliminate the sound. The constant drone cannot be escaped. It takes away the enjoyment of their property. It doesn't allow them to sleep at night.[153]

Their greatest concern is the substantial loss of value of their property. They do not believe they can sell

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142 Ibid.
143 Ibid.
144 Ibid.
145 Ibid.
146 Ibid.
147 Ibid.
148 Ibid.
149 Ibid.
150 David C. Maturen of Maturen & Associates, Inc., *RE: Impact of Wind Turbine Generators on Property Values***.** September 9, 2004. (e-mailed letter.) Studies referenced within text: Blowing in the Wind: Offshore Wind and Cape Cod Economy (October 2003) and Free but Costly: An Economic Analysis of a Wind Farm in Nantucket Sound (March 2004).
151 *Testimony of Russell Bounds, Realtor in the State of Maryland, before the Maryland Public Service Commission on windplants affecting property values,* 2005.
152 Gleen Schleede, *Investment in Wind yields negligible Environmental Benefits***.** Energy Market & Policy Analysis, Inc, Date Unknown.
153 *Testimony of Russell Bounds, Realtor in the State of Maryland, before the Maryland Public Service Commission on Windplants Affecting Property Values,* 2005.

without substantial loss and cannot afford to sustain the loss and move.[154]

Wind farms destroy property value; they take a property of substantial value and take away all of the characteristics that are the strengths of that property. The visual impact takes away value. The noise takes away value. The property owners complain that the wind turbines take away value and there is no way for them to escape.[155]

In Maryland, a wind farm developer accidentally proved the diminution of value when he bought two abutting properties to his wind farm and was unable to sell them for their purchase price. He bought one property for $104,447.50 and sold it for $65,000. He bought another property for $101,049.00 and shortly thereafter sold it for only $20,000.[156]

A similar thing happened to a wind farm developer in New York, as explained by the landowner who sold the property to the wind farm company: "In Apex's glossy brochure, the Wyoming County property that's listed as having sold for $245,000 happens to have been mine. Apex conveniently left out the most important facts about the property: It was a 93-acre farm, sold for $245,000 on June 11, 2013, prior to completion of the 58-turbine Orangeville wind factory that was being constructed. The new owner subsequently broke up the property into three parcels, two of which were sold off after the turbines went up, in July and August 2014. The combined assessed value of the three parcels is now $205,000. That's a $40,000 or nearly 20 percent loss of value after the Orangeville wind factory was built."157

Values of the natural and scenic properties within one-half mile and probably within a mile of the wind turbines will be negatively impacted. The visual impact and the noise impact will substantially diminish special attributes of property including scenic view, natural setting and peace, and quiet. Undeveloped properties will be rendered undevelopable. Some parcels may be rendered unsaleable. The visual impact beyond a mile will likely adversely impact value. The sound impact will apparently vary outside one mile, but some properties outside one mile will be adversely impacted by the noise.[158]

Studies have shown that fear of wind farms can negatively affect purchase prices even if the project is a mile or more away. In one case study, 350 acres of premium ranch land was put on the market for $2.1 million. A prospective buyer agreed to the sale price but backed out when the seller disclosed a 27-turbine wind farm within a 1½ mile radius from the property. The seller discounted the land by 25%, but the buyer still declined to purchase. After two years, there has been little interest in the property despite its other positive characteristics.[159]

Independent studies have shown an average diminution of value up to -37% when the turbine is on the property; up to -26% average diminution for properties within .2 – .4 miles of a turbine; and up to -25% average diminution for properties within 1.8 miles of turbines. Properties can also suffer an additional 15-

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154 Ibid.
155 Ibid.
156 Ibid.
157 Cathi Orr, *Apex's land value impact claims are deceiving*. Lockport Union-Sun & Journal, October 15, 2015.
158 *Testimony of Russell Bounds, Realtor in the State of Maryland, before the Maryland Public Service Commission on Windplants Affecting Property Values,* 2005.
159 Derry T. Gardner, *Impact of Wind Turbines on Market Value of Texas Rural Land***.** Gardner Appraisal Group, Inc, February 13, 2009.

25% diminution in value due to infrastructure construction (clearing, blasting, digging, etc.), HVTLs to transport generated electricity, substations, additional traffic for servicing turbines and HVTLs, and additional roads.[160]

Wind farms have the potential to impact local property values.[161]

To calm property owners, one township recommended that the wind farm developer provide property value assurances that are transferable to subsequent owners of the wind facility.[162]

Noise

Industry advocates say that the windy nature of rural locations often masks the quiet nature of modern turbines, even for "the very few individuals" located close enough to hear it.[163] However, turbine noise greatly affects people even a mile away, and low-frequency noise makes people quite irritable.[164] Industry advocates say little, if anything, about infrasound or low-frequency noise.

The environmental noise pollution from wind turbines built too close to dwellings causes serious discomfort, and often health injury, to families. Oftentimes those affected did not object to the construction, accepting the developer's assurances that noise would not be problematic.[165]

Turbines interact and placement can influence noise emission. Other factors include the constantly changing atmosphere and wind speed, temperature, and terrain. Noise, particularly low-frequency noise, travels not only seismically but also airborne over the terrain. Local geography can sometimes act like a giant microphone.[166]

Shadow flicker and noise are detriments. Noise at the turbine hub can range from 100-105 dBA. It can be noticeable for long distances in more remote areas with existing low ambient levels (Humans can differentiate sounds up to 3 dBA above background levels).[167]

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160 Ibid.
161 Tom Hewson, *Wind Power Siting Issues Overview.* Presented to the National Association of Attorney Generals Wind Energy Facility Siting Issue Panel, April 21, 2008.
162 *Report from the Bethany Wind Turbine Study Committee,* January 25, 2007.
163 *Permitting of Wind Energy Facilities: A Handbook (Revised 2002).* National Wind Coordinating Committee, August 2002.
164 Eleanor Tillinghast, *Wind Turbines Don't Make Good Neighbors: Some Problems of Wind Power in the Berkshires.* Study presented by Green Berkshires, Inc, May 14, 2004.
165 Barbara J. Frey, BA, MA and Peter J. Hadden, BSc, FRICS, *Noise Radiation From Wind Turbines Installed Near Homes: Effects On Health – With an annotated review of the research and related issues.* February 2007, June 2007.
166 Ibid.
167 Tom Hewson, *Wind Power Siting Issues Overview.* Presented to the National Association of Attorney Generals Wind Energy Facility Siting Issue Panel, April 21, 2008.

Quality of Life

Turbine-generated noise has an adverse impact on quality of life and may adversely impact the health of those living nearby. Research links noise to adverse health effects such as sleep deprivation and headaches. Sleep deprivation may lead to physiological effects such as a rise in cortisol levels – a sign of physiologic stress – as well as headaches, mood changes, and inability to concentrate. Initial research into the health impact of wind turbine noise (including the 'visual noise' of shadow flicker) reveals similar findings.[168]

Even proximity to small wind farms can have a serious impact on nearby residents. One Illinois Township, concerned about the potential effects of a 22-turbine wind farm, surveyed its residents and found that, on average, 42% were bothered by blade flicker and noise, had been awakened by turbine sound, and had TV reception problems. Nearby property owners also cited increased lightning activity, increased traffic hazard, annoyance at the tower's blinking lights, the emergence of strange symptoms, and fears of EMFs. These tangible and intangible issues had a marked impact on the market value of nearby real estate. Reluctance to live near the turbines dramatically increased with proximity. For example, 41% of residents would not build or buy a home within 2 miles of the turbines. Within a half mile, 61% would not build or buy a home. And a quarter mile away from the turbines, 74% would not build or buy a home.[169]

In Oklahoma, a couple is trying to move away from wind turbines because they "can't get accustomed to the sounds because it's constantly changing." Their home near the turbines has sat on the market for two years and has received one offer that was 30% below the appraised value.170

In Vermont, landowners reported persistent noise from the turbines that "penetrated the house", causing sleep problems, difficulty with their ears, a pounding sensation in their home, and bothering their children. They abandoned their home but have been unable to sell it, citing disruption from the turbines as the primary reason.171

In Maryland, residents living near wind turbines have filed suits, alleging that the wind farm has interfered with their use, enjoyment, and value of their property. Residents also say that the wind farm has caused mental and physical health problems.172

Wind farm developers said property values wouldn't suffer. But the town zoning administrator did his own empirical research and found that sales within 1 mile of the windmills prior to their construction were 104% the assessed value, and properties selling in the same area after construction were at 78%. Sales more than a mile away were at 105% the assessed value before and 87% after. They also found several properties have taken much longer than normal to sell, and some are still on the market.[173]

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168 Barbara J. Frey, BA, MA and Peter J. Hadden, BSc, FRICS, *Noise Radiation From Wind Turbines Installed Near Homes: Effects On Health – With an Annotated Review of the Research and Related Issues.* February 2007, June 2007.

169 *Excerpts from the Final Report of the Township of Lincoln Wind Turbine Moratorium Committee***.** Prepared by Elise Bittner-Macking for presentation to the Bureau County, Illinois, Zoning Board of Appeals, July 2, 2001.

170 Karl Torp, *Caddo County Couple Fighting Against Wind Turbines*. News 9, April 26, 2017.

171 Matthew Preedom, *Wind Turbines: Do property values fall?* St. Albany Messenger (VT). August 17, 2015.

172 *32 lawsuits filed against Pinnacle Wind Farm*. Cumberland Times-News, November 14, 2013.

173 *Excerpts from the Final Report of the Township of Lincoln Wind Turbine Moratorium Committee***.** Prepared by

A New York landowner has a turbine on his property 2,000 feet from his house and says the turbine rattles his windows, and he can hear some turbines a mile away in his house. The wind company said the sound wouldn't exceed the sound of a refrigerator 900 feet away. He was joined by two other neighbors with similar complaints and who also said neighbors to the turbines started experiencing seizures, anxiety attacks, learning disorders, and other ailments once the turbines started running. Neither he nor the other leaseholders, nor the town has received any promised compensation because the turbines are not selling into the grid. They were told the lights would be the softest available but instead were much brighter than any anticipated.[174]

Wind turbines produce no constant tonality, making the creation of a noise standard challenging.[175]

Audible noise isn't the issue; it's the low-frequency sound waves. 2-3Hz can cause vomiting and other serious health issues. 12Hz can cause hallucinations.[176]

Hills and valleys can create a megaphone effect that can focus the direction, combine, and intensify the sounds of multiple turbines.[177]

Because of the deep foundations necessary to stabilize large wind turbines, LFN is transmitted down and throughout the contours of the land, often following bedrock, and even accelerates to immerge randomly miles from its origin.[178]

500' setbacks are "woefully inadequate…Anything less than a half mile is a recipe for disaster."[179]

Audible noises and LFN vibrations should be considered plus the potential noise of a failed bearing.[180]

In one case this year, two families in Ontario had to move due to adverse health effects from nearby wind turbines. One of the displaced landowners said he started suffering from very high blood pressure, sore feet, and irritability once the farm was online. Once he leaves the farm, he quickly recovers. The wind company is paying for one of them to stay in a hotel while tests are being done on their property.[181]

An industry spokesperson said such complaints are "few and far between" and "there's no cause and effect relationship between audible sound produced by turbines and adverse health effects." He even went so far as to claim, "…all research to date indicates that turbines do not produce infrasound at levels near enough to have impacts on humans."[182]

Elise Bittner-Macking for presentation to the Bureau County, Illinois, Zoning Board of Appeals, July 2, 2001.

174 Nancy Madsen, *New York Wind Farm Foes Say Noise Is Almost Unbearable*. Watertown Daily Times, July 20, 2009.

175 Arnold C. Palmer, *Expert: It's Difficult to Write Noise Ordinance*, July 19, 2009.

176 Ibid.

177 Ibid.

178 Ibid.

179 Ibid.

180 Ibid.

181 Don Crosby, *Wind Farm Neighbours Say They Had to Move.* Owen Sound Sun Times, July 4, 2009.

182 Ibid.

Industry advocates often say health concerns are exaggerations, and those who complain "are just worried about their real estate values."[183]

Elizabeth May, the former Executive Director of Sierra Club of Canada, vehemently defends wind energy but admits that literature studies show that wind towers negatively affect human health. She makes a concession for better project siting – away from impacted citizens.[184]

Strobe lights and shadows destroy any feeling of peace and solitude.[185]

The only potential health effect the wind industry acknowledges is toxic or hazardous materials in the form of relatively small amounts of leaking lubricating oils and hydraulic and insulating fluids.[186] However, even small leakages of such materials can negatively impact groundwater if left unchecked over time.[187] Fluid leaks not only drip directly downward, but they also fly off the tips of the spinning blades, thus spreading the contamination over a wider area.[188] On-site storage of new and used lubricants and cleaning fluids also constitutes a hazard.[189] Even the National Wind Coordinating Committee recommends setback requirements to provide "an adequate buffer" between wind generators and consistent public exposure and access.[190]

Several case studies by industry advocates show little to no concern for proximity landowners. In Oregon's Stateline Project, a 127-turbine farm covering 15 square miles in 2001 only sparked concerns over wildlife protection.[191]

Southwest MN has been building wind farms since 1995 ranging from 17 turbines to 143. Very few issues were raised during the review and permitting process and only after being built have issues emerged regarding poor television reception in proximity to the farms, additional noise generated by loose pieces of material within the blade at low speeds; cleanup of materials associated with turbine or blade modifications. Neighbors have also been complaining of their aesthetic detriment. Bird health is also an issue.[192]

As the number of houses near to, or with a view of the installation increases, the likelihood of aesthetic or economic objections seems to increase.[193]

New homeowners were attracted by the area's rural character and do not view their land as a source of

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183 Ibid.
184 Daniel & Carolyn d'Entermont, *Letter by Elizabeth May: Wind Power Flaps***.** www.dangerwind.org/main.htm, March 13, 2009. Nova Scotia, Canada.
185 Eleanor Tillinghast, *Wind Turbines Don't Make Good Neighbors: Some Problems of Wind Power in the Berkshires***.** Study presented by Green Berkshires, Inc., May 14, 2004.
186 *Permitting of Wind Energy Facilities: A Handbook (Revised 2002***).** National Wind Coordinating Committee, August 2002.
187 Ibid.
188 Ibid.
189 Ibid.
190 Ibid.
191 Ibid.
192 Ibid.
193 Ibid.

livelihood, nor identify with the farmers in the area who earn their living working their land. These "commuter" households are less likely to support a proposed wind project because they do not understand the economic situation of resident farmers and the extent to which wind energy revenues may act as a buffer against the fluctuations of the farm economy. Suburban development pressure may not be a fatal problem if the remaining farmers still control the local government.[194]

Developers may wish to consider compensating the community in some fashion that benefits even non-participants, such as impact payments to the township. Resulting benefits, such as reduced property taxes, may help to address concerns about inequities.[195]

A rural mountain community in Virginia fears that a proposed 19-turbine, 400-feet-tall-each project will blight their rural landscape and destroy the area's scenic beauty. The wind farm developer claims the turbines can power 20k homes. Community response has been very negative. Residents are afraid the turbines will kill tourism—their only industry—and negatively impact property values.[196]

A proposed 67-tower wind farm in Illinois sparked strong opinions among its affected community. Supporters say it will bring additional property tax revenue, jobs, and clean energy. Its opponents say it will be an eyesore, a dangerous obstacle to crop dusters, and would lower property values. An acoustical engineer from Michigan testified that the turbines would create noise that could affect nearby residents.[197]

Turbines are visually distracting, out of place, and threaten residents' peace and quality of life.[198]

Turbines create infrasound, low-frequency noise, flicker effect, loss of TV reception, cell phone, local networking reception disruptions, and electronic/electromagnetic interference. Careful placement might lessen the effects, but it's doubtful.[199]

Strobe lighting from the towers is a source of electrical pollution.[200]

Turbines generate flicker and shadows that can distract nearby motorists.[201]

They also interfere with television signals, thus affecting the quality of life for nearby residents.[202]

In addition to landscape blight, landowners are furious when the wind farm developers bring new transmission lines to transmit the wind energy to metro areas. But utilities are generally dismissive of such

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194 Ibid.
195 Ibid.
196 Adam Hochberg, *Wind Farms Draw Mixed Response in Appalachia***.** Npr.com., July 23, 2009.
197 Kevin Sampler, *Wind Farm Opponents Air Concerns; Experts say Rail Splitter project will create noise, affect property values.* Journal Star, May 2, 2008.
198 *Report from the Bethany Wind Turbine Study Committee*, January 25, 2007.
199 Ibid.
200 *Report from the Bethany Wind Turbine Study Committee*, January 25, 2007.
201 Ibid.
202 Eleanor Tillinghast, *Wind Turbines Don't Make Good Neighbors: Some Problems of Wind Power in the Berkshires***.** Study presented by Green Berkshires, Inc., May 14, 2004.

concerns, usually saying that "the importance of the lines outweighs the aesthetic worries."[203]

In pursuing alternative energy sources, it is imperative not to strip property rights to streamline green energy projects as the Ontario Minister of Energy proposes; he wants to invalidate municipal zoning laws preventing industrial wind farms and severely restrict what citizens can appeal. [204]

Tall structures are highly visible.[205]

In Europe, where wind farms have existed and operated for many years, people are loath to be near them, especially in scenic areas.[206]

Economic Impact

Some townships prefer to look at the projected tax revenues from proposed wind farms. One township in Ohio estimated that a 100MW wind farm would yearly generate the tax dollar equivalent of 449 homes, and they estimate a 300MW farm would generate the tax dollar equivalent of 1,347 homes. Due to conflicting studies on the impact of turbines on property values, they chose to disregard the issue completely. They anticipate significant positive local property tax impacts are possible assuming they can tax and collect at local levels. They expect local spending, job creation, lease payments, and earnings and outputs to increase regardless of the turbines' tax status. And they expect to maintain a "healthy, equitable and sustainable tax base" by balancing residential development with commercial development and conserving open/farmlands to prevent the county from continuing to become a "bedroom community."[207]

Wind farm projects have little to no significant job impact.[208] In Ireland, wind energy promoters' claims of job creation were rebutted by Britain's environment secretary who said that wind farms had "significant impacts on the rural economy and the rural environment."209

Wind farms contribute little to county property taxes. In some states, energy producing equipment is exempt from property taxes; taxable items may be limited to foundation and tower structure. Some developers also apply for additional local tax relief.[210]

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203 Amanda Casnova, *Transmission Line Debates: Wind here, towers somewhere else.* Abilne Reporter-News, July 18, 2009.
204 Sven Hombach, *Guest Article: Ontario Set to Become a Wind Power-house.* National Renewable Energy Group of the Fraser Milner Casgrain, LLP. Windpowerlaw.info, June 16, 2009.
205 Tom Hewson, *Wind Power Siting Issues Overview***.** Presented to the National Association of Attorney Generals Wind Energy Facility Siting Issue Panel, April 21, 2008.
206 Candida Whitmill, *UK Energy Policy: The Small Business Perspective & The Impact on the Rural Economy.* Small Business Council, February 2006.
207 Dave Faulkner, Exec. Director of Community Improvement Corporation of Champaign County, Ohio, *Economic Impact Study of Wind Farm Development in Champaign County, Ohio.* Prepared for Champaign County Wind Tower Study Group, November 13, 2007.
208 *Report from the Bethany Wind Turbine Study Committee*, January 25, 2007.
209 Frank McDonald, *Jobs claim by wind farm lobby dismissed*. The Irish Times, October 16, 2012.
210 Tom Hewson, *Wind Power Siting Issues Overview.* Presented to the National Association of Attorney Generals Wind Energy Facility Siting Issue Panel, April 21, 2008.

A public policy research group studied a proposed wind farm in Nantucket Sound and found it failed the cost-benefit test recommended by the U.S. government for assessing large-scale projects. The wind farm developer stressed the value of wind power as a source of clean, renewable energy. But the study found that the overall economic costs of the project would exceed benefits by $211.8 million. Without $241 million from state and federal subsidies, the project would not be financially viable. And while the farm may generate some wind energy jobs, the impact on tourism would result in a net loss of 1,000 local jobs.[211]

Industry advocates frequently cite additional tax revenues as a positive reason to build wind farms. General Electric, the wind turbine manufacturer that's currently backlogged $12 billion in turbine orders, claims that over the long-term wind farms will add $250 million to the US Treasury. However, they also acknowledge they will only begin to "pump money into the US Treasury" once the Production Tax Credits expire. PTCs are good for the first 10 years of a wind farm's production. They also project creating thousands of short-term construction jobs with long-term employment of 1,600 over 20 years or more of operation. They also project 10 million metric tons per year of CO2 emissions avoided.[212]

Rural tourism is big business in the UK (worth approximately $26.7 billion) and supports up to 800,000 jobs. 75% of visitors say the quality of the landscape and countryside is the most important factor in choosing a destination. Between 47% and 75% of visitors felt that wind turbines damage landscape quality. Of the three areas they studied, they found that 11% of visitors would avoid Case #1, resulting in a loss of $48.5 million and the loss of 800 jobs. Approximately 7% of visitors would not return to the second case, resulting in a loss of $117 million and 1,753 jobs. In the third case, just 5% would stay away, but its affluence would result in $668.5 million lost along with 15,000 jobs. In some areas, 49% of all sectors of rural businesses experienced a negative impact.[213]

The success of rural enterprises is inextricably linked to the maintenance and conservation of a healthy and attractive and irreplaceable rural appeal.[214]

In a tourist area of the UK, five wind farms are proposed totaling 71 turbines along 18 miles. In a pilot survey of 1,500 visitors, approximately 95% of the visitors said wind turbines would spoil their enjoyment of the landscape. And this spoiling directly translates into less business from tourism and thus, lost jobs.[215]

In another tourist area in the UK, two-thirds of local businesses said turbines are visually intrusive. While 54% thought wind turbines would increase their 'green' credentials, 27% believed it would still have a negative impact on the tourism industry by reducing visitor numbers. After the details of the tower heights were revealed the next year, the 27% grew to 39% who felt the 400-foot-high turbines would make visitors stop visiting completely.[216]

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211 *Beacon Hill Institute Study: Cape Wind proposal fails cost benefits test.* The Beacon Hill Institute for Public Policy Research, March 16, 2004.
212 Steve Taub (Senior VP of GE Energy Financial Services), *GE Energy Financial Services Study: Impact of 2007 Wind Farms on US Treasury***.** GE Energy Financial Services, Date Unknown.
213 Candida Whitmill, *UK Energy Policy: The Small Business Perspective & The Impact on the Rural Economy***.** Small Business Council, February 2006.
214 Ibid.
215 Ibid.
216 Ibid.

In North Devon, an area renowned for its beauty, a before-and-after survey was conducted to gauge visitors' feelings toward possible wind farms. Before details of their 300' height were revealed, 34% were generally favorable and 66% unfavorable towards turbines. After the size and location of the turbine proposals were revealed, the number of 'unfavorable' visitors rose to 84%. When asked if wind farms would affect their choice of holiday destination, just less than 50% claimed that they would still choose North Devon. A further 39% said they would choose North Devon, but subject to the size and location of the wind farms. Eleven percent would stay away from North Devon altogether. Visitors claimed that if they found wind turbines on their arrival and had not been previously informed, 15% would complain to their tour or holiday operator and around 28% stated they would never return.[217]

Scotland is also proposing wind farms, but a visitor survey found that 15% of visitors would not return if wind turbines are built, resulting in a potential loss of $133.7 million and 3,750 jobs.[218]

Wind energy advocates claim their wind farms would actually boost tourism. They tried it in the UK, and both utterly failed, proving that visitors do not accept wind farms as tourist attractions. In 1999, a visitor's center was built in Norfolk, UK – then home to one of the largest turbines in the world. It ran out of money and closed in 2002. Then in 2001, a $9.1 million visitor center was built with hopes of attracting 150,000 annual visitors to its wind farm. Despite opening with much publicity, it attracted less than a tenth of projected visitors, and it went bankrupt. Its CEO debunked advocates' mindset when he said, "Sadly, just like many eco-attractions, they're not sustainable; there's just not enough interest."[219]
They recommend micro-generation as an acceptable alternative.[220]

In summary, the media generally portrays the impact of wind turbines on residential properties as negative, bringing up fear factors and conflicting benefit, or no benefit issues. Overall, the qualitative factor is centered along the lines of health, noise, flicker, and viewshed. With regard to the question, "Do wind turbines affect property value?" the two Centerville Township (Michigan) officials summed it up with this statement: "It is totally counter-intuitive to suggest anything else."

217 Ibid.
218 Ibid.
219 Ibid.
220 Ibid.

Review of Impact Studies

Review of Impact Studies

Introduction

Though not an exhaustive listing, the following studies, and articles were utilized to develop an opinion as to what impact a wind farm will have on property value.

- *The Impact of Wind Power Projects on Residential Property Values in the United States: A Multi-Site Hedonic Analysis (2009 updated in 2013)* by Berkeley National Laboratory (California).

- *Impact of Industrial Wind Turbines on Residential Property Assessment in Ontario, 2012 Assessment Base Year Summary* by Municipal Property Assessment Corporation (MPAC).

- *Case Study Diminution in Value Wind Turbine Analysis (2012)* by Ben Lansink, AACI, P.Appr, MRCS, real estate appraiser (Ontario, Canada).

- A market study by Glen Taylor on the Chevron Wind Tower Development in Wyoming.

- *Wind Turbine Impact Study (2009)* completed by Kurt C. Kielisch, Appraisal Group One (Wisconsin).

- *Values in the Wind: A Hedonic Analysis of Wind Power Facilities (2011)* completed by Heintzelman and Tuttle, Clarkson University (New York).

- *Coral Springs Development Study (2007)* completed by Kurt C. Kielisch, Appraisal Group One (Wisconsin).

- *Mendota Hills Residential Property Impact Study (2011) completed by Michael S. McCann (Illinois).*

- *Big Sky Wind Farm Matched Pair Analysis Study (2015)*, completed by Kurt C. Kielisch, Forensic Appraisal Group (Wisconsin).

The following is a review and critique of each study.

Berkeley National Laboratory Study

In the fall of 2009, the Berkeley National Laboratory (California) released their study, "The Impact of Wind Power Projects on Residential Property Values in the United States: A Multi-Site Hedonic Analysis." This study was sponsored by the Department of Energy. In summary, this study found no relationship between the presence of wind turbines and residential property value. A review of this study brings out several observations that the reader should be cognitive of when considering applying these findings to a wind farm in Illinois.

No Real Estate Value Experts

The first problem with this study is the use of hedonic modeling to isolate variables in value. Though this is a recognized methodology in the statistical world; it is still young in its application to the real estate appraisal field. This modeling technique is considered a tool in the appraiser's toolbox which can assist him in making valuation decisions, but it is not the sole source of determining value in real estate. The appraiser must also apply his expertise and, some would say, "art," to the understanding of the valuation process to arrive at a realistic interpretation of the results of the study. This fact is recognized in the study where it states, "It should be emphasized that the hedonic model is not typically designed to appraise properties…"221 One of the leading real estate appraisal texts adds, "Appraisers should recognize the differences between statistical processes in the collection and description of data and should be able to distinguish between descriptive and inferential statistics. Without an understanding of the issues, any use of statistical calculations is dangerous or ill-advised." 222 It is here where we take issue with the foundation of the study and its authors.

Through correspondence with Ben Hoen, the primary author of the Berkeley Labs study, it was learned that no one involved in the study was an expert in real estate valuation, nor had any practical experience as a real estate appraiser, a real estate broker, or as a real estate developer. Ben Hoen is trained in applied statistics, having a master's degree in that field. The other signature authors are Thayer, Ph.D. in economics (i.e. how things work, not their value); Sethi, Ph.D. in agriculture and resource economics (again, how it works, not its value); Wiser, Ph.D. in energy and resources; and Cappers, masters in applied economics. In review, one can see that these authors are well-schooled in economics, but not in the practical valuation of real estate. This academic approach most likely led to an error in the selection of the database for the model—the use of improved residential properties.

Use of Improved Residential Properties

The use of improved residential properties in large-scale statistical analysis can be problematic. Appraisers know that the easiest real estate to use in statistical analysis is vacant land. This is due to a number of variables which may impact the value. When valuing land, there are approximately 12 value factors commonly used by appraisers to represent how the market (buyer) would react.223 The value factors that are specific to land are:

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221 Berkeley study, page x.

222 *The Appraisal of Real Estate* – 12th Edition (Chicago: Appraisal Institute), 440.

223 This number may vary between property types and appraisers, but the noted variables are typical.

- Size
- Location
- Shape
- Topography (woods, open area, soils, physical limitations)
- Water features (ponds, creeks, streams, rivers, lakes, oceans)
- Wetlands and flood zones
- Terrain (level, rolling or severe)
- Zoning
- Utilities (private or municipal water and sewage, natural gas, electrical and telephone)
- Road frontage (town, county, highway or interstate roads)
- Access (direct off-road, indirect via a long driveway, access easement, no access)
- View (including positive and negative environmental factors)224

When you add residential improvements to the equation you not only have the 12 value factors of land, but you add another 25 variables which typically include:225

- Location of improvements
- View
- Physical age
- Condition
- Quality of construction
- Style/design/number of stories
- Exterior siding
- Roof cover/gutters/downspouts
- Gross living area above grade
- Basement (full, partial, crawl, exposed/hillside)
- Finished area in basement
- Garage/carport (size, # car storage)
- Finished area in or above garage
- Room count (total rooms/bedrooms/bathrooms)
- Patios (concrete, brick)
- Porches (open, covered, screened)
- Decks (type of wood, size, levels)
- Air conditioning (central, zoned, through wall)
- Type of furnace (forced air, hot water, steam, gas, in floor, fuel oil, electric)
- Energy efficiency items
- Functional utility (layout of interior rooms, functional problems, outdated items)
- Extra buildings (sheds, barns, workshops)

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224 These factors are mentioned in *The Appraisal of Real Estate* - 12th Edition (Chicago: Appraisal Institute), 333.
225 This number may vary between property types and appraisers but are typical for most properties.

- Fireplace (wood, gas, stoves)
- Landscaping (including paved/concrete/brick driveways and walks, shrubbery, and gardens)
- Special features (Jacuzzi, hot tubs, built-in appliances, stone countertops, wood or tiled floors, built-in entertainment centers, theater rooms, swimming pools, ponds, fencing, etc)226

Factors that were not mentioned in this list, but have an influence on value, are street appeal, interior decorating and availability of financing.

As you may imagine, when you add these value factors to the land value factors you have an exponential number of potential match-ups and adjustments. For this reason, an experienced appraiser would know that to compare 7,500 improved properties of all sizes, styles, ages, conditions, gross living areas, amenities, and different localities would be a nearly impossible task without the ability to appraise each sale independently, assessing all the factors of value.

The list of variables considered in the hedonic analysis appears on page 21 of the Berkeley study. You will notice there are only three variables in relation to land, that being size in acres, cul-de-sac, and waterfront (yes/no question with no consideration to quality, type, amount, etc.). In relation to the actual improvements, there are 9 variables. These variables are:

- Age
- Gross living area above grade
- Number of bathrooms
- Exterior siding (only variable is stone, brick or stucco – not vinyl, steel, wood or log)
- Air conditioning (central air only, yes/no)
- Finished basement (only includes finished if it is greater than 50% of area)
- Waterfront (the only factor is fronting on water with no reference to type, size, amount, etc.)
- Condition
- Vista (view)

This list is missing 26 other distinct and important variables of value for a residence. To ignore these is an error and could result in an inaccurate comparison of the sales used in the analysis.
Due to the sheer size of this study and the logistics of obtaining the data on the improved properties, the authors of the study chose to collect their data via government records. These records included assessor records, which can be problematic. Few assessment records are considered up-to-date on the condition of the property and other improvements which give value, such as fencing, landscaping, room layout, and decoration. Most assessment records are only updated on a periodic basis and contain the base information about the residence. This base is what undoubtedly limited the selection of the valuation variables utilized in the hedonic models.

Location of Sales – Urban vs. Rural

An appraiser or real estate professional recognizes that location is of primary importance. In most cases,

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226 Note: This is not an inclusive list of the variables present with residential improvements. Many of the items listed are found on the Fannie Mae form 1004/Freddie Mac form 70.

it simply cannot be adequately factored in to get a true representation of how the market would react. For instance, there is a distinct difference between the typical buyer of a rural property, who desires to get away from the noise and congestion of the urban environment and is willing to be inconvenienced to obtain this escape, as compared to that of an urban buyer who will accept the noise, congestion, and other urban settings for the convenience factor. Therefore, it would be unwise to compare residential sales of these separate and distinct environments to each other. However, the Berkeley study does just that.

An example of this may be found on page 84. This page shows a map of the wind towers and the residential sales utilized in the study. The red '+' marks denote the placement of the wind turbines and the maroon dots denote the sales used in the study. This map shows nearly all the sales utilized were in an urban area, either in Kennewick (9 miles to 20 miles away) or Milton-Freewater (approximately 9 miles away). Only a few sales are located outside of these urban areas. An extreme example of this would be found on page 90, whereas nearly all the sales are located in the City of Weatherford. This pattern is repeated in most of the study locations (pages 93, 99, 102, 108, and 111). The best study, having the most non-urban sales, can be found on page 96, whereas only a small portion of sales is found in the cities of Paw and Compton. Unfortunately, this study had only 2 sales that were less than 1.00 mile from a wind turbine out of a total of 412 sales utilized.

Of particular interest was the study found on page 99. This study area is located in the Kewaunee and Door County area of Wisconsin. This author is very familiar with this area, having appraised a number of properties along State Highway 57, which runs through these two counties. In this study; you can see that most of the sales were from the urban centers of Luxemburg, Casco, Brussels, and Algoma. In addition, the Algoma area fronts on Lake Michigan with dynamic views of the lake and is known for tourism due to its location on the water. Opposite, and on the other side of the land mass, is the Green Bay area which is a large bay of Lake Michigan between Door County and the city of Green Bay. These sales are all aligned along the lake shore which has high bluffs with dynamic lake views. Any residence found in either area would be oriented toward the lake vista and not inwards toward the wind turbines. In addition, Algoma is over 5 miles to the east of the nearest wind turbines, which are not visible. The same is true of the other urban areas and the Green Bay shoreline. This opinion is supported on the chart found on page 101 which lists only 5 sales with either a substantial or extreme view of the wind turbines. Lastly, it was this same area that homes were purchased by the wind farm developer who then either razed the buildings or resold the property at a substantial loss. This information appears not to be included in the study.

Few Sales in Close Proximity to Wind Turbines

The study utilized approximately 7,500 residential, improved sales. Of this number, only 67 sales (<1%) were within 0.57 miles of a wind turbine and 63 sales (<1%) had a substantial or extreme view of the wind turbines. Conversely, 98% of all the sales were a mile or greater in distance away, with the greatest number being over 3 miles away (57%).227 The author correctly states that view or vista is a significant factor in value. The study has a chart showing that a poor vista results in a -21% loss of value and a below average vista results in a -8% loss.228 However, when this vista measurement was applied to substantial and extreme views of the wind turbines it found the opposite to be true, indicating a +2.1% increase in value by having an extreme view. This result is counter-intuitive: Common sense and experts in the real

227 Berkeley study, xiii, xiv.
228 Ibid, 29, Figure 5.

estate field would agree that a wind turbine meets the definition of a poor vista. Surely, a wind turbine does not enhance the vista. When the study compared proximity to the wind turbines (which may overlap the Vista factor) it found a -5.3% to -5.5% loss in value.229 It would appear that the problem lies in the number of samples in close proximity with a clear view of the wind turbines as suggested by the author regarding the proximity factor not being significant in statistical terms: "Even though the differences are not found to be statistically significant, they might point to effects that exist but are too small for the model to deem statistically significant due to the relatively small number of homes in the sample within 1 mile of the nearest turbine."230 Though a -5.5% loss in value may not be substantial in the field of statistics, it is substantial in the valuation of real estate as any appraiser or property owner would know. This type of loss would equate to a $13,750 loss for a $250,000 home.

Other Studies Have Found a Negative Impact

Though the Berkeley study found no loss of value for an improved residential property due to proximity to a wind farm, other studies have suggested otherwise. The study's author acknowledges this very point, listing the studies he found in his literature research regarding the impact of wind turbines on real estate values. In the chart found on page 9, the author notes that 3 out of 4 (75%) of the homeowner surveys found a loss; 3 out of 5 (60%) of the expert surveys found a loss; 2 out of 10 (20%) of the transaction analysis-simple statistics found losses; and 3 out of 4 (75%) of the transaction analysis-hedonic model found losses. As a matter of fact, the only two studies authored by certified real estate appraisers (McCann, Kielisch) both found significant losses and the only hedonic model study listed in this chart that did not find a loss was the Berkeley (Hoen) study.

It would appear that the Berkeley study is only one of a few that have resulted in finding no impact on property value due to the presence of wind turbines. One reason for this could go back to the very base of the model, the selection of improved residential properties and their limitation to extract values due to the complexity and sheer number of the variables to value that interplay with the final market value. Another reason is cited by Heintzelman stating, "However, they limit themselves to discontinuous measures of proximity based on having turbines within 1 mile, between 1 and 5 miles, or outside of 5 miles, or a similar set of measures of the impact on scenic view, and they again find no adverse impacts from wind turbines. In addition, by including so many disparate regions within one sample they may be missing effects that would be significant in one region or another."231

Another potential reason for their finding of no impact could be the lack of adequate numbers of sales within close proximity to the wind turbines for their statistical study to work properly. The author identified this as problematic, saying, "Unfortunately for the study, most wind power projects are not located near densely populated areas. As a result, finding a single wind project site with enough transaction data to rigorously analyze was not possible."232 This, of course, is a prejudice of many academic statisticians, but it is not shared with the appraisal profession as indicated by this statement from a guide to statistical analysis by the Appraisal Institute, "Based on the experience of the authors, the

229 Ibid, 31.
230 Ibid, 31.
231 Martin D. Heintzelman, Ph.D. & Carrie M. Tuttle, *Values in the Wind: A Hedonic Analysis of Wind Power Facilities* (Clarkson University, 2011), 8-9.
232 Berkeley Study, 10.

ideal number of sale properties usually ranges between 18 and 32."233 Indeed, a smaller, localized study may be a much better analysis to isolate the impact on property value of a wind turbine than a combination of 10 different studies in nine states.

Conclusion

This brief review touched on several major points to consider when looking at the Berkeley study. It showed that the base of the study (that is, to use improved residential sales) has a great potential to result in flawed conclusions due to the great number of value variables present in such properties. A vacant land analysis would have been better and more accurate. The selection of sales combining both urban (city) and rural sales is flawed on the onset since these two buyer groups are very different from each other and have different motivations for their purchases. Of course, the reason the two were combined was due to the lack of a large number of sales in and around the wind turbines themselves. This could suggest to the authors that: (a) possibly this lack of sales activity is due to the presence of the wind turbines themselves; or (b) the sales sample set and model should be smaller, potentially resulting in a more accurate measure of the effects. The desire for a large database caused the authors to combine ten different studies located in nine different states, states that were decidedly different from each other, which resulted in a larger database pool. However, on the practical side of real estate valuation, such a large database is not representative of greater accuracy. It could be that these basic errors in judgment were a result of the lack of professional and practical experience in the real estate valuation field.

This is a study of improved residential properties, which overwhelmingly were located in urban centers, not the rural countryside. This study did not measure impacts to agricultural land, recreational, or rural residential land. Therefore, its direct application to such properties is cautioned.

233 *A Guide to Appraisal Valuation Modeling* (Chicago: Appraisal Institute), 61.

Impact of Industrial Wind Turbines on Residential Property Assessment in Ontario, 2012 Assessment Base Year Summary

The Municipal Property Assessment Corporation (MPAC) completed this study to review their assessment practices with regard to the potential negative impact to property value caused by the presence of wind turbines. MPAC is a governmental agency responsible for the assessment of millions of properties in the Ontario, Canada, region. This agency is both political and governmental. Political since the directors are politically appointed and governmental in that a finding of a negative value impact due to the wind turbines would require the local assessors to revalue such impacted properties and the governmental agencies that are dependent upon tax revenue from property assessments would be negatively impacted. With this responsibility, the MPAC went about testing the null hypothesis that there is "no difference between properties in close proximity to wind turbines to those that are not." (A null hypothesis in statistics basically assumes no difference between two sets.) MPAC chose to test this hypothesis through the use of checking the accuracy of their assessments by comparing the two sets and then using statistical analysis of selling prices to test if there is a valuation impact.

The first test examined the accuracy of the assessments in the two data sets, one being less than 2km proximity to a wind turbine and the other outside of that distance (>2km). Using Canadian government assessment standards of accuracy, which state that an assessment is considered accurate if the assessment-to-sale price (ASR) lies within 0.95 to 1.05 of the assessment. An ASR ratio is calculated by assessment ÷ sale price. As an example, if a property was assessed at $100,000 and sold for $105,000 the ASR would be 0.952 or 95% of the assessed value and the assessment would be considered accurate. If the property sold for $90,000 the ASR would be 1.11 or 111% of the assessed value and the assessment would fail the accuracy test.

The geographic area of this study was fifteen market areas in Ontario, Canada. These areas were identified as potential study markets since wind turbine farms were in their vicinity. MPAC tested the assessment ratios pre-construction of the wind farms (but after their announcement) and after the construction of the wind farms. The hypothesis was if the ratios were within the acceptable range, i.e. 0.95 to 1.05, for both data sets and in both conditions, then there was no relationship between the presence of wind turbines and value.

The test of the ASR showed those properties within the 2km distance of wind turbines had a -4.2% to -4.5% loss factor. Since this was within the 5%± acceptable range of value, MPAC concluded wind turbines do not impact property value. It should be noted that the overall property values that were <2km were consistently less than those values >2km (MPAC report, figure 2, p.18) and their ASRs were higher, typically over 1.034 as compared with the >2km properties which were in the 0.992 range.

The second test was a sales analysis using multiple regression analysis. This study indicated that only two market areas had sufficient pre-construction and post-construction sales to derive a variable for this comparison. One of these areas, market area 26RR010-Chatham, indicated a loss of $6,451 per property if <1km of a wind turbine and a loss of $3,686 if within the 1km-2km distance. Both statistics were considered not statistically significant since they were at the 10% significance level.

Overall, the study concluded that distance to a wind turbine was not a factor influencing property value.

Critique

The first test of the study had little to do with measuring the impact on property value due to the presence of a wind turbine and everything to do with measuring the accuracy of assessments. There is nothing said in the report to investigate if the local assessors had already considered the locational factor in their assessment. So, if a home that was located outside of the zone of influence and would have a value of $125,000 and assessed accordingly, and a similar home that laid within the zone of influence would have a value of $100,000 and assessed accordingly, the ASR for both subsets would be 1.00. Accordingly, if you applied the MPAC test of ASRs you could conclude there is no influence due to the wind turbines. Hence, this first test was simply an exercise in measuring their accuracy of assessment and not to extract an impact factor.

The second test had some issues as the charts illustrated. For instance, in only two out of the fifteen market test areas did they have sufficient sales to measure both the pre-construction and after-construction values, which was the stated purpose of this exercise. Additionally, one of the two areas indicated a measurable (though not deemed significant) negative effect. Of course, the problem here, as with the Berkeley study, is that there were few variables measured for the improved properties. Limiting these value-influencing variables is a mistake that will skewer the results of any study. The study itself did not provide any insight into the other variables to be considered and why or why they were not included. It can be said with consistency that this study indicated properties within close proximity of the wind turbines had overstated assessments and lower valued properties.

Case Study Diminution in Value Wind Turbine Analysis (2012)

Real estate appraiser Ben Lansink, AACI, P.Appr, MRCS, real estate appraiser (Ontario, Canada) completed a comparative sales analysis study of five properties located within a wind farm area. These properties were selected because they were purchased by the Canadian Hydro Developers, Inc (Hydro) who was the developer of the Melancthon Wind Facility (MWF) located in Shelburne, Ontario, Canada. MWF is a 200-megawatt development comprised of one hundred and thirty-three General Electric 1.5mw wind turbines having 262ft± tall towers and a 147ft± blade wingspan. The wind farm was developed in two phases, with the first phase coming online in 2005 and the second in 2008. Hydro purchased these five properties at the property owners' request and paid full market value for each property according to Lansink. The purchases were completed between 2005-2007, and the resale of the properties took place between 2009-2012. Lansink inspected all the properties in 2012, compared the results of the personal inspection with the MLS listings at the time of purchase and resale to note any changes that may have taken place. The five properties consisted of four single-family residences and one farm.

Lansink used a comparative analysis of twenty comparable properties sold in 2005-2007 to measure the validity of the initial purchase price concluding that the properties were purchased at market value without consideration given to the value influence of the wind farm. He then proceeded to do a market trend study in the area to establish a measurable and reasonable adjustment for time. He then applied this market trend adjustment to predict the market value of the properties sold at a later date and compared that estimate to the actual sale price. The difference, if any, was applied to the wind farm influence having all other factors being equal. He concluded the following:

Sale 1- This property was a 1.5-story Cape Cod design residence on 1.88 acres. Its room count was 6 total rooms, 3 bedrooms and 2 bathrooms (6/3/2). The closest wind turbine was 1,902ft away. The home was purchased in November 2007 for $500,000 and sold two years later in December 2009 for $288,400. The condition of the home was considered the same in both sale dates. When the market trend adjustment was factored the estimated resale price was $557,509 representing a -48.27% loss due to the wind turbine. If no market trend adjustment was applied, the loss would be -42.32%.

Sale 2- This property was a 2-story farmhouse residence on 100± acres. Its room count was (13/4/2) with 3,500sf of gross living area. It had a large Quonset agricultural building. The closest wind turbine was 1,902ft away. The home was purchased in October 2007 for $350,000 and sold about three years later in November 2010 for $175,000. The condition of the home was considered the same in both sale dates. When the market trend adjustment was factored, the estimated resale price was $422,272 representing a -58.56% loss due to the wind turbine. If no market trend adjustment was applied the loss would be -50.00%.

It should be noted that Hydro chose to market the property as "vacant land," however Lansink inspected the property and found the buildings viable and considered the sale "as improved."

Sale 3- This property was a 2-story contemporary design residence on 10± acres. Its room count was (6/3/1) and included a 2-car garage and raised wood decks. The closest wind turbine was 664ft away. The home was purchased in January 2007 for $305,000 and sold two and

a half years later in August 2009 for $278,000. The condition of the home was considered the same in both sale dates. When the market trend adjustment was factored, the estimated resale price was $362,153 representing a -23.24% loss due to the wind turbine. If no market trend adjustment was applied the loss would be -8.85%.

Sale 4- This property was a split-level design residence on 1± acre. Its room count was 10/5/2 and had a 1-car attached garage. The closest wind turbine was 1,136ft away. The home was purchased in August 2007 for $302,670 and sold two years and nine months later in April 2010 for $215,000. The condition of the home was considered the same in both sale dates. When the market trend adjustment was factored the estimated resale price was $293,172 representing a -26.66% loss due to the wind turbine. If no market trend adjustment was applied the loss would be -28.97%.

Sale 5- This property was a bi-level design residence on 2± acre and had a 2-car attached garage. The closest wind turbine was 1,213ft away. The home was purchased in June 2005 for $299,000 and sold seven years later in June 2012 for $250,000. The condition of the home was considered the same in both sale dates. When the market trend adjustment was factored the estimated resale price was $398,723 representing a -37.3% loss due to the wind turbine. If no market trend adjustment was applied the loss would be -16.39%.

Depending on how you calculated the losses, either from the estimated market value at the date of resale or the difference between the purchase and resale price with no consideration for the time lapse, the analysis found the following losses:

Market trend method:

Median loss	-37.30%
Average loss	-38.81%

The difference between purchase and resale method:

Average loss	-29.31%

If you isolate the impact on only rural residences having less than 10 acres (excluding Sale 2), then the losses change slightly.

Market trend method:

Average loss	-33.87%

The difference between purchase and resale:

Average loss	-24.13%

In summary, the study indicated that the presence of a wind turbine in close proximately (664ft to 2,531ft) resulted in significant value losses ranging from an average of -24% to -39%.

Glen Taylor Chevron Wind Tower Market Study - Wyoming

In 2010, realtor Glen Taylor (Equity Brokers, Casper, Wyoming) completed an informal market study of the residential properties in close proximity to the Chevron Wind Tower Development. The area of study was in Evansville, Wyoming just outside of Casper. The wind farm had 11 wind turbines. Mr. Taylor based his study on observations of market activity both in near proximity to the wind farm and out of the wind farm influence. His study concluded:

> "My determination was that the presence of the large Wind Towers has had a detrimental effect on property values, not only residential property values, but also unimproved and presently uninhabited properties as well. Keep in mind; these now uninhabited properties may someday be candidates for development of residential or small ranchette type of locations. The report also indicates that those properties closest to the development are the most affected by the huge towers close to adjacent property lines and my 20 years of experience in the real estate marketing business tells me that the further away the towers are from adjacent property lines, the less affected the property values would be. The term "further" may be the key word here as it can be a very subjective term."234

234 Letter to Converse County Commissioners, November 2, 2010, from Glen Taylor.

Appraisal Group One Study - Wisconsin

Figure 1: This is a view of the Blue Sky Green Field wind farm.

In the fall of 2009, Appraisal Group One (now, Forensic Appraisal Group, Ltd, Wisconsin) completed a study entitled "Wind Turbine Impact Study – 2009" for the Calumet County Citizens for Responsible Energy, a group of property owners united to prevent wind farms from being located in their county. The study examined the impact that wind turbines have on rural residential property value. The wind turbines that were the focus of this study are approximately 389ft tall and produce 1.0+ megawatts each. This study was based in Dodge and Fond du Lac Counties, Wisconsin. It was broken down into three parts: A literature study, a realtor opinion survey, and sales studies. Overall, the study concluded that the presence of a wind farm had a negative impact on rural residential property value 5 to 10 acres in size, and farmettes up to 20 acres in size. The impacts according to the realtor survey suggested losses ranging from 24% to 43%; the literature study indicated losses averaging 20.7%, and the sales study indicated losses ranging from 19% to 74% – with the most likely range of loss being 19% to 40%. Some observations of this study and its conclusions follow.

Realtor Survey

The purpose of the realtor survey was to learn from the people who are on the first tier of the buying and selling of real estate what they thought of wind turbines and their impact on residential property value. This survey was designed to measure what type of impact (positive, negative, or no impact) that wind turbines have on vacant residential land and improved property. The questions were designed to measure three different visual field proximity situations to wind turbines. These three were *bordering* proximity (defined as 600ft from the turbine), *close* proximity (defined as 1,000ft from the turbine) and *near* proximity (defined as one-half mile from the wind turbines). In all situations, the wind turbines were visible from the property.

Graphics and photographs were utilized to illustrate each question so that the survey taker would have the same or similar understanding as others on each question. In addition to asking the realtors about the type of impact they expected in each situation, the survey then asked them to estimate the percentage of the impact. Though it is understood that realtors are salespeople and not appraisers, it is also true that they often have to estimate asking prices for their clients or act in the capacity of a buying agent for a client. Both situations demand an estimate of value and recognition of those factors that both benefit and detract from value.

The geographic area for the selection of the survey participants was defined by the wind farm projects. These projects were in Fond du Lac and Dodge Counties, Wisconsin.

A total of 36 realtors were surveyed, indicating an average of 13.4 years of experience.

The survey indicated that, in all but two scenarios, over 60% of the participants thought that the presence of the wind turbines had a negative impact on property value. This was true of both vacant land and improved land. Where the group diverted from that opinion is when they were presented with a 10-20 acre hobby farm being in *close* and *near* proximity. In these cases, 47% (close proximity) and 44% (near proximity) of the participants thought that the wind turbines caused a negative impact on property value. The answers showed that *bordering* proximity showed the greatest loss of value at -43% for 1-5 acre vacant land and -39% for improved properties. Next in line was the *close* proximity, showing a -36% value loss for 1-5 acre vacant land and -33% for improved property. Last in line was the *near* proximity, showing a -29% loss of value for a 1-5 acre vacant parcel and -24% loss in value for improved parcels. These losses show a close relationship between vacant land and improved land. This pattern was replicated regarding the *bordering* proximity for a hobby farm, whereas 70% believed it would be negatively impacted. Lastly, the opinions regarding the impact of the wind turbines due to placement (that being in front of the residence or behind the residence) showed that in both situations most participants believed there would be a negative impact (74% said negative to the front placement and 71% said negative to the rear placement).

In conclusion, it was observed that: (a) In all cases with a 1-5 acre residential property, whether vacant or improved, there will be a negative impact on property value; (b) with 1-5 acre properties, the negative impact on property value in *bordering* proximity ranged from -39% to -43%; (c) with 1-5 acre properties, the negative impact on property value in *close* proximity ranged from -33% to -36%; (d) with 1-5 acre properties, the negative impact on property value in *near* proximity ranged from -24% to -29%; (e) in all cases the estimated loss of value between the vacant land and improved property was close. However, the vacant land estimates were always higher by a few percentage points; (f) it appears that hobby farm use on larger parcels would have lesser sensitivity to the proximity of wind turbines than single-family land use; and (g) placement either in front or at the rear of a residence has similar negative impacts.

Literature Study

This study looked at the recent articles and studies published related to the impact of wind turbines on residential property values. The review broke down the articles into several categories including health issues, health solutions, wind turbine hazards, conservation concerns, property values and land use, noise, quality of life, wind energy production, wind farms as tax havens, and economic impact.

Below is a brief summary of the findings:

- Articles and studies show wind turbines:
    - Intrude on the viewshed
    - Make noise
    - Cause flicker and strobe light irritants
    - Limit development
    - Affect highest & best use
    - Increase time on the market
    - Lower property values

- Wind industry cites a 2004 study by the Renewable Energy Policy Project to support their position that there is no impact on property value. REPP is an organization dedicated to advancing renewable energy.
- European countries report property losses from 10% to 30%.
- Realtors overwhelmingly consider wind turbines to have a negative impact on property value.
- Independent appraisers usually find a diminution of land value due to the presence of wind turbines.
- Regarding rural properties, articles indicated that land values are affected by the turbines due to:
    - Incursion into peaceful countryside,
    - Turns farms and land into industrial zones,
    - Flicker, noise and nighttime strobes.
- Adjacent properties are impacted the same as the host landowner but receive none of the compensation.
- Sometimes land values remain the same or increase for the host landowners.
- Value impact decreases with distance from the turbine.

After reviewing the articles and studies on wind energy, the study concluded that wind turbines appear to have a negative impact on the property values, health, and quality of life of residents in close proximity. Of the studies that found no impact on property value, nearly all were funded by wind farm developers or renewable energy advocacy groups. Of the studies and reports showing property loss, the average negative effect is -20.7%.

Additionally, the research shows it is equally reasonable to conclude that some residents in close proximity to wind turbines experience genuine negative health effects from Low-Frequency Noise, infrasound and blade flicker. Of the studies and reports cited, an average setback of little over a mile should significantly lessen detrimental health effects. In addition to noise and flicker issues, disrupted TV and cell phone receptions contribute to a negative impact on the quality of life for residents living in close proximity to wind turbines.

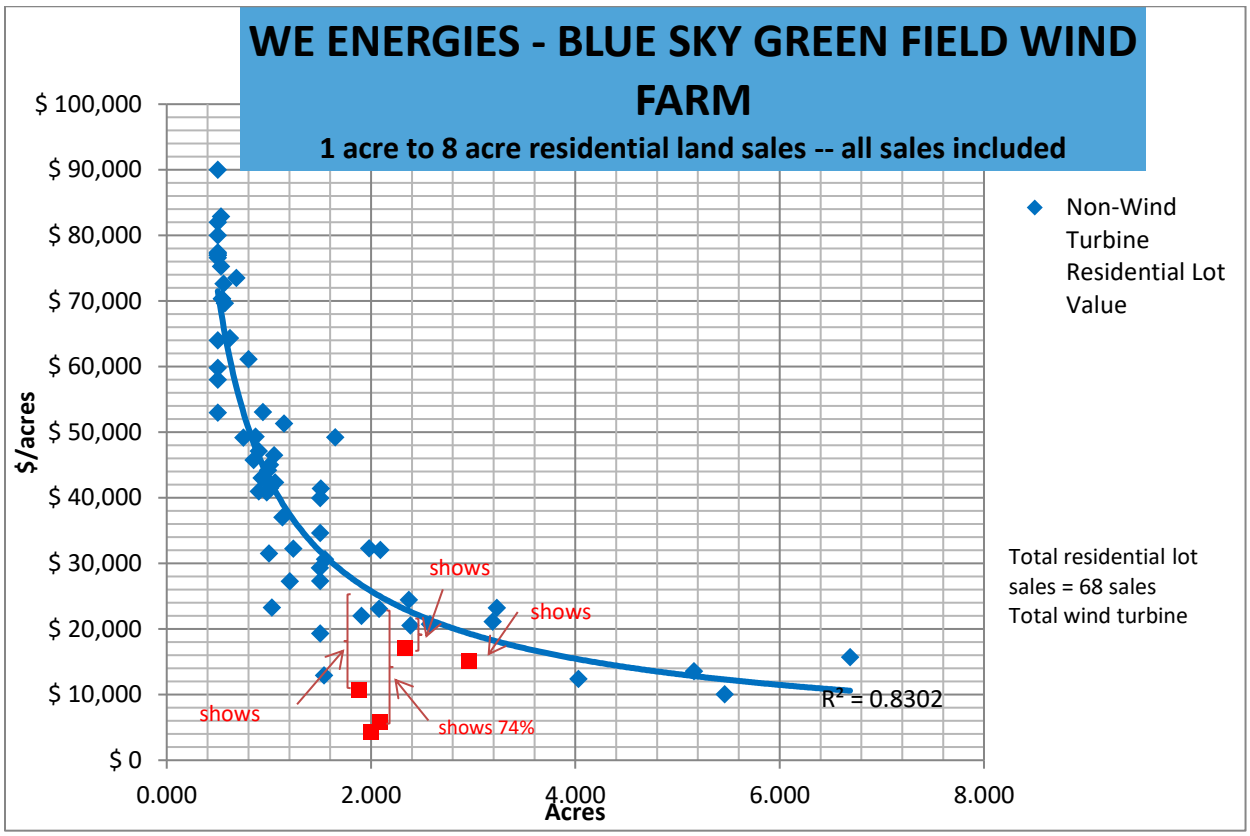
Sales Study

The purpose of the wind turbine impact sales studies was to compare the residential land sales of properties located within the wind turbine farm area to comparable land sales located outside of the influence area of the wind turbines. Being located outside of the influence area meant that the wind turbines could not be seen from the property.

The areas of study include the WE Energies – Blue Sky Green Field wind farm located in the northeast section of Fond du Lac County and the Invenergy – Forward wind farm located in southwest Fond du Lac County and northeast Dodge County, all in the State of Wisconsin. The sales studies and their conclusions follow.

WE Energies – Blue Sky Green Field Wind Farm Sales Study

The area of study was the northeast section of Fond du Lac County bordered by Calumet County to the north, Lake Winnebago to the west and Sheboygan County to the east. The study included the townships of Calumet, Taycheedah, and Marshfield. A total of 68 vacant residential land sales were utilized for this study. From that total, 6 land sales were within the influence of the wind turbines (within the wind farm parameters), and 62 sales were located outside of that sphere of influence. The simple regression analysis graph is found below.

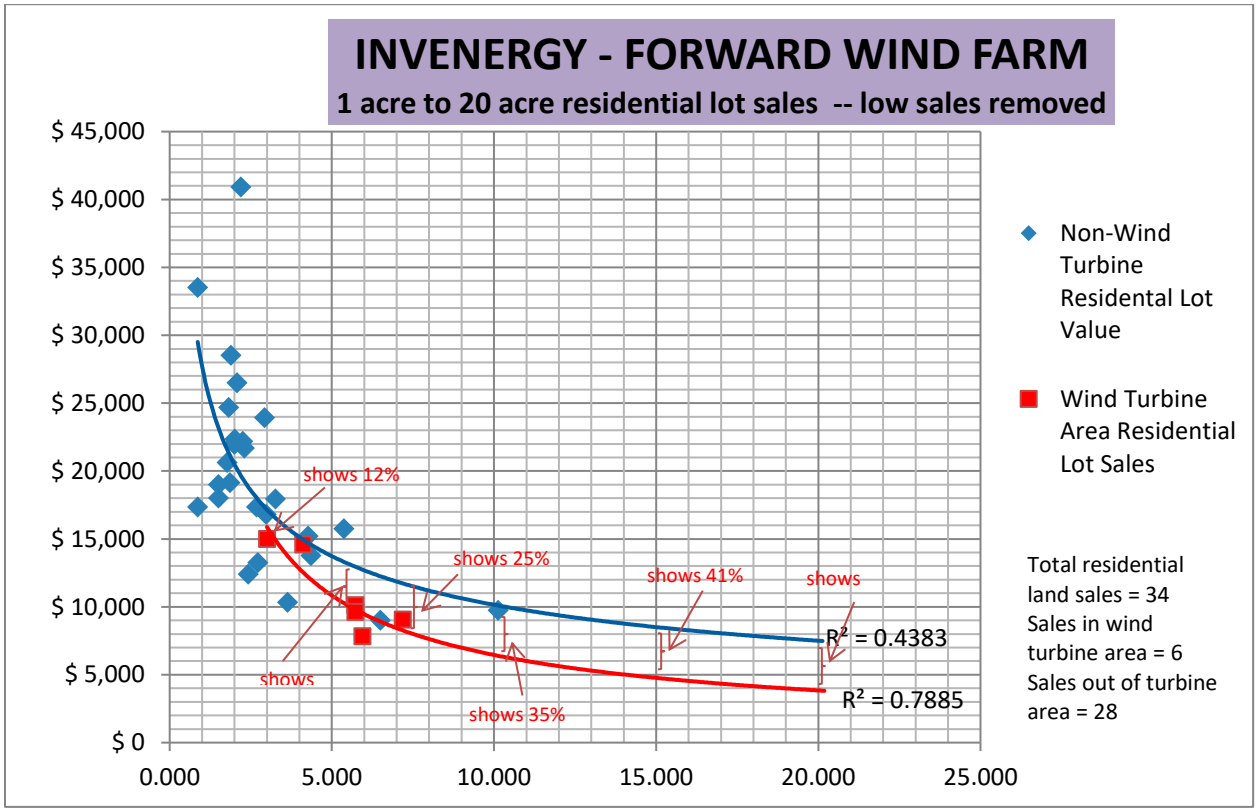


The sales study indicated three factors: (1) Sales within the wind turbine influence area sold for less than those outside of this area; (2) there were substantially fewer sales available within the turbine influence area as compared to those sales outside of the influence area; and (3) the impact of the wind turbines decreased the land values from -19% to -74%, with an average of -40%. Additionally, it can be said with a high rate of confidence that the impact of wind turbines on residential land sales is negative and creates a loss greater than -19%, averaging -40%. It is logical to conclude that the factors that created the negative influence on vacant land are the same factors that will impact the improved property values. Therefore, it is not a leap of logic to conclude that the impact of wind turbines on improved property value would also be negative, most likely following the same pattern as the vacant land sales, that being greater than -19%, averaging -40%.

Invenergy – Forward Wind Farm Sales Study

The area of study was the southwest section of Fond du Lac County and the northeast section of Dodge County being bordered by US Highway 41 to the east and Horicon Marsh to the west. The study included the townships of Oakfield and Byron in Fond du Lac County and Leroy and Lomira in Dodge County. A total

of 34 vacant residential land sales was utilized for this study. From that total, 6 land sales were in the influence of the wind turbines (within the wind farm parameters) and 28 sales were located outside of that sphere of influence. The simple regression analysis graph is found below.



The sales study indicated three factors: (1) Sales within the wind turbine influence area sold for less than those outside of this area; (2) there were substantially fewer sales available within the turbine influence area as compared to those sales outside of the influence area; and (3) the impact of the wind turbines decreased the land values from -12% to -47%, with the average being -30%. Additionally, it can be said with a high rate of confidence that the impact of wind turbines on residential land sales is negative and creates a loss greater than -12%, averaging -30%. It is logical to conclude that the factors that created the negative influence on vacant land are the same factors that will impact the improved property values. Therefore, it is not a leap of logic to conclude that the impact of wind turbines on improved property value would also be negative, most likely following the same pattern as the vacant land sales, that being greater than -12%, averaging -30%.

Conclusion

The sales study indicated that there was a loss in value of rural residential properties from a low of -12% to a high of -74%. The most typical range of loss could be concluded to be in the range of -19% to -40%. This study was for rural residential large acreage properties ranging from 1 to 10 acres. The properties impacted by the wind turbines all had a view of the turbines and were less than one-half mile from any wind turbine. This study did not measure impacts to agricultural land or recreational; therefore, its direct application to such properties is cautioned.

Clarkson University Study (Heintzelman & Tuttle)

On March 3rd, 2011, Assistant Professor Martin D. Heintzelman, Ph.D., and Carrie M. Tuttle, a Ph.D. candidate in Environmental Science and Engineering, Clarkson University, published their study entitled "Values in the Wind: A Hedonic Analysis of Wind Power Facilities." This study used 11,369 arm's length transactions of residential and agricultural properties between 2000 and 2009 in Northern New York State to extract the impact of wind farms on property value. They found that the nearby wind facilities significantly reduced property values. Specifically, they found that "Decreasing the distance to the nearest turbine to 1-mile results in a decline in price of between 7.73% and 14.87% on the average."235 At the block-group level, the existence of a wind turbine between 1 and 3 miles away impacted property values between -15.6% and -31%.236

Study area

The study area included three counties in Northern New York State, Clinton, Franklin and Lewis Counties. This area is located in the northeast corner of New York bordering Vermont to the east, Canada to the north and has within the area, Adirondack Park, and Lake Champlain. The area of the study is primarily rural, lightly populated, with small towns and villages. The area of study includes six wind farms which are not within the borders of the Park but are in close proximity. The per capita income analysis for the area indicates that it is less affluent than the rest of New York State. The typical property value in the study was $106,864.

Conclusions from the Study

The study indicated several factors. First, the impact of a wind farm on property values was significantly negative. Second, distance is a direct factor in the negative influence, and the further the distance the lesser the impact. Last, when measured with properties outside the influence area of the wind farms, the impact can be as great as -32.06% (being within 0.10 miles of a turbine) to -13.79% (being 3 miles away from a wind turbine) when measured as a block-group with fixed effects factored in. A more conservative conclusion, using the repeat sales method, results in an impact of -24.12% (being within 0.10 mile of a wind turbine) to -10.06% (when 3 miles away).237 Other results showed at the block-group level that the existence of a wind turbine between 1 and 3 miles away impacted property values between -15.6% and -31%.238

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235 *Values in the Wind*, 2.
236 Ibid, 21.
237 *Values in the Wind*, 39, Table 12.
238 Ibid, 21.

Coral Springs Development Study (Forensic Appraisal Group, Ltd)

The Coral Springs development is located on Boulder Ridge Road across the road from Fish Creek, in Section 34, T13N, R73W, of Albany County, Wyoming. This development is comprised of 7 lots being 35.1 acres to 35.3 acres in size, having a mix of vegetation from spruce and fir trees to grassland and sagebrush. It is in the foothills, having a view of the grassland valley to the east and north. Currently, there are no residences in this development, however, there are some storage buildings built on Lot A. It is improved with private gravel/dirt roads and underground utilities. The development has protective covenants which require stick-built homes - no modular or mobile homes. It has direct access to Boulder Ridge Road which connects with Cherokee Park Road one mile to the east. It is being marketed by Duane Toro Real Estate, Laramie, Wyoming; Duane Toro and Bob Davis, agents. One parcel was marketed by Dean Smith a private property owner. The original development owners are Grant L. Lindstrom and Shane M. Cox.

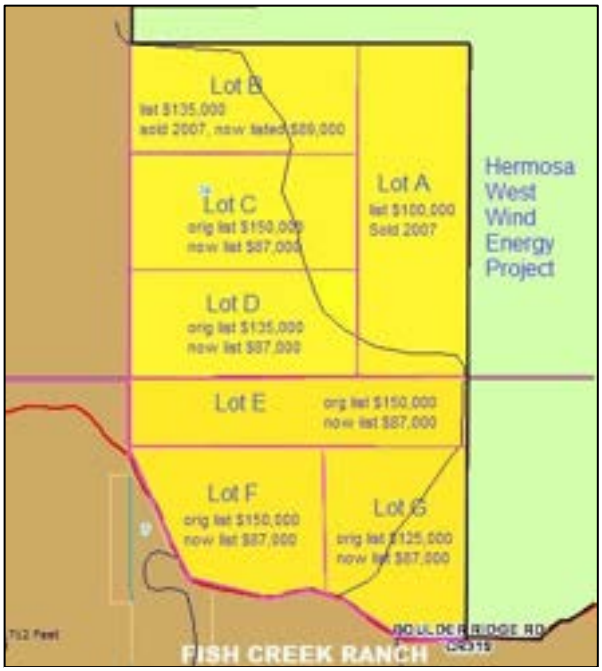


Figure 2: The Coral Springs development is highlighted in yellow with the original and new listing prices noted per lot. The Hermosa West project is highlighted in light green. Fish Creek is located just south of the development.

Sales and Listing History

Since the development began, there have been three lots sold: two lots before the Hermosa West Project was announced and one lot after.

Lot A sold for $100,000 on July 13th, 2007 to Stanley P. Hobbs as a custodian for Morganna E. & Alexandra L. Hobbs. Lot B sold for $100,000 on December 12th, 2007 to Dean P. Smith and Diane Smith-Conroy. The listing price on Lot A was $100,000 and on Lot B $135,000. These sales were completed before the Hermosa West project was announced. The remaining lots were listed between $125,000 to $150,000.239

Since the Hermosa West project was announced and is known in the area, the owner of Lot B has placed his lot up for sale, asking $79,000 and sold for $75,000, June 13, 2010.240 This sale shows a $25,000 (25%) deduction from its original sold price in 2007. The remaining unsold lots have all been reduced to $87,000 since November 15, 2010. This reduction ranges from -30% for the lowest lot listed at $125,000, and -42% for the ones listed at $150,000.

It would appear that the Smith sale is an indicator of how the market is responding to the proposed wind farm and the remaining listed parcels will sell for much less than the new asking price. Investigating the reason for the decrease in unsold lot prices, two factors were uncovered that played a part: The sluggish economy and the Hermosa West project. According to the seller, the Smith property was put up for sale

239 Information confirmed with listing broker, Bob Davis.
240 Information confirmed with Bob Davis, Michelle White, and court records.

due entirely to the Hermosa West project which is proposed to abut the Coral Springs development to the east and north.241

Observations and conclusions

It is apparent that, though the sluggish economy in the Wyoming real estate market can be attributed to some of the declines in property value, the Hermosa West project appears to be the dominating factor, indicating a negative impact on value with a potential range of -25% to -44%, showing an average of -35%.

241 Information confirmed with Dean Smith.

McCann Value Impact Study

Michael S. McCann, CRA, a state licensed Certified General Appraiser (Illinois), completed a study of improved residential properties in the Mendota Hills wind farm area (Lee County, Illinois). This study was completed for property owners who were disputing the claims of another wind farm developer that wind farms do not have an impact on residential property value.

Mendota Hills wind farm is located near the village of Paw, Lee County, Illinois, and operated 63 wind turbines at the time of the study. Each wind turbine stands 214ft from ground to the bub and has three 85ft long blades. It was constructed in June-November 2003. It was the first utility-scale wind farm in the state.

Mr. McCann compared the average sale price $/GLA of fifteen residences located within two miles of the Mendota wind farm to the average sale price $/GLA of thirty-eight residences located greater than two miles from the Mendota wind farm. The time period of this study was 2003-2005 when the residential market was very robust in the Lee County area.

The study indicated the following values:

STUDY GROUP	LOCATION	VALUES
GROUP 1	Within 2-miles of Mendota wind farm	$ 78.84 sf
GROUP 2	Greater than 2-miles of the Mendota wind farm	$104.72/sf
	Difference in sale price per GLA	$ 25.89/sf
	Average diminution of value of residences within 2-miles of the wind farm	-25%

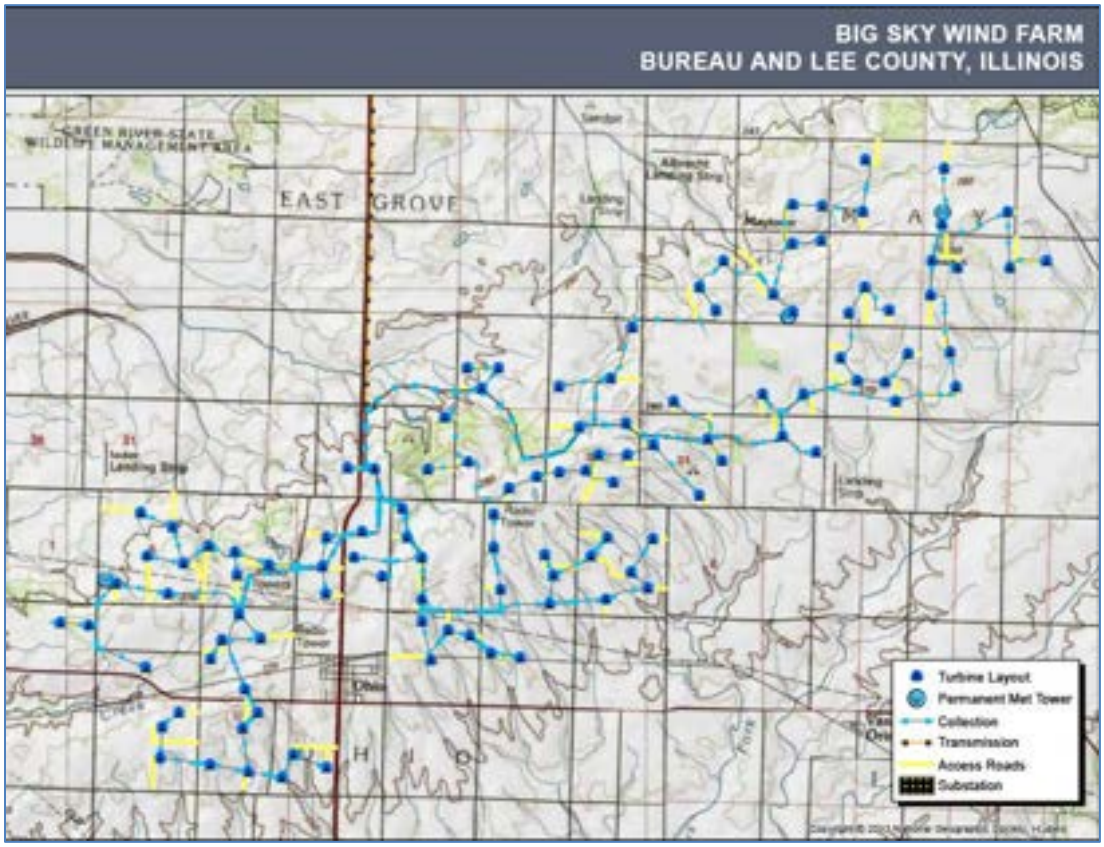
Mr. McCann concluded that the presence of the Mendota wind farm had a -25% impact on residential improved properties that were located within two miles of the wind farm.

Figure 3: Mendota Hills wind farm west of I-39. (Wikipedia)

Big Sky Wind Farm (IL) Matched Pair Analysis (Paired Data Analysis)

A matched pair analysis study using residential sales outside of the Big Sky Windfarm was completed in July 2015, by Kurt C. Kielisch (Forensic Appraisal Group, Ltd, Wisconsin). A matched pair analysis (a.k.a. paired data sales analysis) is defined as "a procedure used in the direct sales comparison approach to estimate values of specific property characteristics in order to find a value of the subject property. Property sales are paired with similar property characteristics."242 The Appraisal Institute's text further defines paired data analysis as: "A quantitative technique used to identify and measure adjustments to the sales prices . . . of comparable properties . . . to isolate the single characteristic's effect on value . . ."243 The isolated variable, in this case, was the impact that wind farms, i.e. wind turbines, have on residential property value.

This wind farm is located in Lee and Bureau Counties centered around Ohio, Illinois. Big Sky is a 22,400-acre project area generating 240MW through one-hundred and fourteen 80-meter tall wind turbines of 2.1MW each.



242 The Language of Real Estate (1991). Jeffrey D. Fisher, Robert S. Martin and Paige Mosbaugh. Real Estate Education Company. Chicago. Pg 137.
243 The Appraisal of Real Estate 14th Edition (2013). Appraisal Institute. Chicago. Pg 399.

The scope of work (SoW) followed for this analysis was:

1. Collect all topographical and aerial maps of Big Sky which show the placement of the wind turbines.
2. From the Big Sky wind turbine placement map, create a study map indicating three zones: zero zone which is within the confines of the wind farm, 1-mile zone which is a band approximately one mile wide generating from the perimeter of the zero zone and 3-mile zone which is a band approximately 3-miles wide generating from the edge of the zero zone.
3. Search for all residential sales found within the three zones from January 1st, 2011 to present to make certain all sales took place right before or after Big Sky was in operation.
4. Utilize MRED (MLS), Zillow, and assessment records as our research tools for finding sales.
5. Once sales were discovered confirm the sale was not a foreclosure, short sale or non-arms- length transaction. Remove all non-sales from the study.
6. Using the remaining sales search for comparable sales within the non-impact zone (greater than 5-miles from the edge of the zero zone, or sales less than this distance that cannot see the wind turbines). Keep the parameters narrow as to the dates of sale, gross living area (GLA), size of parcel, style of residence, number of outbuildings, and location.
7. Confirm that the comparable sales discovered are all arms-length transactions. Remove the sales that did not fit this category.
8. Pair up the "wind farm zone" sales with comparable non-wind farm sales. Remove all wind farm zone sales that did not have adequate comparable sales.
9. Locate all sales on a study map.
10. View all sales confirming the data description from our sources, take pictures and note location and view of wind turbines. Remove wind farm zone sales that do not have a view of wind turbines.
11. Confirm all wind farm zone and comparable sales with either the buyer, seller or broker of the transaction, check assessor's records and get a copy of the transaction deed.
12. Create sales sheets for all sales.
13. Create a sales map of all sales.
14. Complete matched pair analysis of selected wind farm zone sales and their corresponding comparable sale.
15. Utilize Marshall & Swift Cost services, extracted values from sales and other acceptable methods to support adjustments for known variables in the analysis.

The following pages include five matched pair analyses, sales map locating the sales utilized and data sheets of each sale.

Matched Pair 1						
Item	Sale 1-WF	adj	Comparable 1-A	adj	difference	notes
Sale ID	Subitte-IR-001		Leecter-IR-003			
distance to WT	1.72 miles (cluster)		none visible (see note)			wind turbines 0.875 miles from comparable but cannot see them due to the wooded area and ravines, can see them as you exit and enter subdivision.
address	408 LaMoilee Road		1939 Ole Hickory Rd			
city/county	Sublette/Lee		Amboy/Lee			
sales price	$ 250,000.00		$ 272,000.00			
terms	arms length		arms length			
terms adj	typical	0%	typical	0%		
date of sale	January 9, 2015		June 19, 2015			
difference in months	base		-5			
time adj			none needed	0%		
adj sales price	$ 250,000.00		$ 272,000.00			
GLA (above grade)	2,271		2,008			
$/GLA	$ 110.08		$ 135.46		-23%	comparing GLAs only with no other adjustments
neighborhood	rural		rural- subdivision	$ -		subdivision has superior appeal is factored in land
lot size in acres	3.01		2.2	$ 13,500.00		based on $15,000/ac
lot description	open with few trees		good landscaping, mature trees	$ (10,000.00)		superior landscaping
home style	1 sty- traditional		1 story- traditional	$ -		
exterior siding	vinyl/brick		vinyl	$ 5,000.00		brick 3% adjustment based on cost
home built/eff age	2004/10yrs		2000/14yrs	$ 13,000.00		total economic life used = 55 yrs
condition	very good		very good	$ -		
room count	7 total/4 br/3.5bth		6 total/3 br/2.5 baths	$ 6,000.00		bathroom contribution value = $6,000
GLA in sf	2,271		2,008	$ 21,000.00		contribution value = $80/sf
basement	partly finished		finished 924±sf, br, fam, kit, fair quality	$ (4,000.00)		finished bsmt at $20/sf contribution value includes extra br, family rm, bath less the partial finish of WT sale
patio/deck/porch	patio		deck	$ -		similar
fireplace	yes- 2 sided		yes	$ -		similar
central air	yes		yes	$ -		
garage	attached 3-car		attached 3-car	$ -		similar size
outbuildings	none		2 car garage w/loft	$ (15,000.00)		garage = $15,000 contribution value
other	gravel drive, garden tub, central vac, in ground pool		paved driveway, whirlpool	$ 7,000.00		paved vs gravel= $5,000, whirlpool= garden tub, central vac = $2,000, pool= $10,000
total adjusted $				$ 36,500.00		
total adjusted value (adj + adj sales price)		$ 250,000.00		$ 308,500.00		
difference in value in $					$ (58,500.00)	
difference in value in %					-23%	overall impact due to presence of wind turbines/farm

Matched Pair 2-A						
Item	Sale 2-WF	adj	Comparable 2-A	adj	difference	notes
Sale ID	Ohio-IR-001		Wyanet-IR-001			
distance to WT	0.32 miles		none			no wind turbine was visible from property, closest turbine was 5.58 miles away
address	29813 2010 E. Street		16025 Wyanet-Walnut Rd			
city/county	Ohio/Bureau		Wyanet/Bureau			
sales price	$ 231,000.00		$ 275,000.00			
terms	arms length		arms length			
terms adj	typical	0%	typical	0%		
date of sale	June 2, 2015		April 3, 2015			
difference in months	base		2			
time adj			none needed	0%		
adj sales price	$ 231,000.00		$ 275,000.00			
GLA (above grade)	2,316		1,936			
$/GLA	$ 99.74		$ 142.05		-42%	comparing GLAs only with no other adjustments
neighborhood	rural- near Ohio		rural- near Wyanet	$ -		
lot size in acres	6.07		6.95	$ -		similar in size
lot description	mature landscaping, trees & stream		mature landscaping, young trees	$ 5,000.00		stream typically adds +10% of land value
home style	1.5 sty - traditional		1.5 sty- traditional	$ -		
exterior siding	vinyl		vinyl	$ -		
home built/eff age	2001/eff 12yrs		1998/eff 12 yrs	$ -		similar in condition and effective age
condition	good		good	$ -		
room count	7 total/4 br/2.5bth		6 total/3 br/2.5 baths	$ -		
GLA in sf	2,316		1,936	$ 29,000.00		based on $ 78/sf contribution value
basement	full - unfinished		full- partly finished	$ (12,000.00)		estimated @ $12,000
patio/deck/porch	deck, screened porch		covered porch	$ 2,500.00		deck = cov porch, screened porch = $2,500
fireplace	yes		yes	$ -		
central air	yes		yes	$ -		
garage	2 car attached		2 car attached	$ -		
outbuildings	refurbished barn - ave condition		large steel pole barn with truck & reg overhead doors	$ (20,000.00)		refurbished barn = $10,000 contrib value, pole barn with concrete floor, storage, ave qlty = $30,000
other	concrete drive, hot tub, heated garage		concrete circular drive	$ -		comparable concrete drive was larger $2,000, hot tub $1,000 and heated garage $1,000
total adjusted $				$ 4,500.00		
total adjusted value (adj + adj sales price)		$ 231,000.00		$ 279,500.00		
difference in value in $					$(48,500.00)	
difference in value in %					-21%	overall impact due to presence of wind turbines/farm

Matched Pair 2-B						
Item	Sale 2-WF	adj	Comparable 2-B	adj	difference	notes
Sale ID	Ohio-IR-001		Marion-IR-001			
distance to WT	0.32 miles		none			no wind turbines visible, closest one is 9.42 miles.
address	29813 2010 E. Street		1033 Pump Factory Rd			
city/county	Ohio/Bureau		Dixon/Lee			
sales price	$ 231,000.00		$ 225,000.00			
terms	arms length		arms length			
terms adj	typical	0%	typical	0%		
date of sale	June 2, 2015		June 24, 2014			
difference in months	base		11			
time adj			none needed	0%		
adj sales price	$ 231,000.00		$ 225,000.00			
GLA (above grade)	2,316		2,900			
$/GLA	$ 99.74		$ 77.59		22%	comparing GLAs only with no other adjustments
neighborhood	rural- near Ohio		rural- near Wyanet	$ -		
lot size in acres	6.07		1.08	$ 40,000.00		estimated 1 acre value at $20,000, 6 acre= $60,000
lot description	mature landscaping, trees & stream		mature landscaping, trees	$ -		
home style	1.5 sty - traditional		1.5 sty- traditional	$ -		
exterior siding	vinyl		vinyl	$ -		
home built/eff age	2001/eff 12yrs		1999/eff 12 yrs	$ -		similar in condition and effective age
condition	good		good	$ -		
room count	7 total/4 br/2.5bth		8 total/4 br/1.5 baths	$ 5,000.00		adj based on one bath
GLA in sf	2,316		2,900	$ (45,500.00)		based on $ 78/sf contribution value
basement	full - unfinished		none (crawl space)	$ 21,000.00		estimated @ $20/sf x 1,038sf due to no basement
patio/deck/porch	deck, screened porch		lg cov porch, lg deck	$ -		deck = deck, screened porch = lg cov porch
fireplace	yes		yes	$ -		
central air	yes		yes	$ -		
garage	2 car attached		2 car attached	$ -		
outbuildings	refurbished barn - ave condition		none	$ 10,000.00		refurbished barn = $10,000 contribution value
other	concrete drive, hot tub, heated garage		gravel drive, hot tub	$ 6,000.00		concrete $5,000, hot tub $1,000, heated garage $1,000, comparable had an above ground pool treated as personal property
total adjusted $				$ 36,500.00		
total adjusted value (adj + adj sales price)		$ 231,000.00		$ 261,500.00		
difference in value in $					$(30,500.00)	
difference in value in %					-13%	overall impact due to presence of wind turbines/farm

Matched Pair 3						
Item	Sale 3-WF	adj	Comparable 3-A	adj	difference	notes
Sale ID	Eastove-IR-001		Walnut-IR-001			
distance to WT	0.34 miles to nearest one		none visible			closest wind turbine to comparable sale is 5.2 miles
address	31 Peoria Road		27531 1250 E. Street			
city/county	Ohio/Lee		Walnut/Bureau			
sales price	$ 125,000.00		$ 139,700.00			
terms	arms length		arms length			
terms adj	typical	0%	typical	0%		
date of sale	December 8, 2012		February 4, 2014			
diffence in months	base		-14			
time adj			none needed	0%		
adj sales price	$ 125,000.00		$ 139,700.00			
GLA (above grade)	1,420		1,864			
$/GLA	$ 88.03		$ 74.95		15%	comparing GLAs only with no other adjustments
neighborhood	rural- close to Ohio		rural - close to Walnut	$ -		
lot size in acres	2.45		2.5	$ -		similar
lot description	mature landscaping some trees		mature landscaping some trees	$ -		
home style	ranch		ranch	$ -		
exterior siding	vinyl		wood press board, brick wainscoting in front	$ 3,600.00		5% of cost per sf contribution value of residence for press board vs vinyl
home built/eff age	1978/24 yrs		1977/24 yrs	$ -		similar condition and effective age
condition	average		average	$ -		
room count	7 total/3 br/2bth		7 total/4 br/3.5 baths	$ (5,000.00)		adj is for 1.5 baths @$3,000 per bath & $2,000 half
GLA in sf	1,420		1,864	$ (22,200.00)		based on $50/sf contribution value
basement	no basement- slab		full- partly finished	$ (14,000.00)		estimated @ $10/sf x 1420sf due to no basement
patio/deck/porch	brick paver patio		none	$ 2,000.00		
fireplace	yes		yes	$ -		
central air	yes		yes	$ -		
garage	3 car detached		2 car attached	$ 8,000.00		$8,000 per car bay beyond two
outbuildings	32x40 pole shed- newer		none	$ 22,000.00		pole shed estimated at $39,000 new, $22,000 contribution value
other	concrete drive, new greenhouse, fence		concrete drive, none	$ 6,000.00		greenhouse estimated at $5,000 contribution value, fence=$1,000
total adjusted $				$ 400.00		
total adjusted value (adj + adj sales price)		$ 125,000.00		$ 140,100.00		
difference in value in $					$(15,100.00)	
difference in value in %					-12%	overall impact due to presence of wind turbines/farm

Matched Pair 4						
Item	Sale 4-WF	adj	Comparable 4-A	adj	difference	notes
Sale ID	May-IR-001		Bradord-IR-001			
distance to WT	0.53 mi to closest one		none			no wind turbines in view, closest one is 7.89 miles
address	341 Rockyford Road		2369 McGirr Road			
city/county	Amboy/Lee		Ashton/Lee			
sales price	$ 132,000.00		$ 183,000.00			
terms	arms length/divorce		arms length			
terms adj	typical	10%	typical	0%		Realtor stated thought sold under market due to divorce, 10% adjustment was made to represent this based on comments & appraiser's experience
date of sale	February 6, 2015		October 6, 2014			
difference in months	base		4			
time adj			none needed	0%		
adj sales price	$ 145,200.00		$ 183,000.00			
GLA (above grade)	2,000		1,936			
$/GLA	$ 72.60		$ 94.52		-30%	comparing GLAs only with no other adjustments
neighborhood	rural		rural	$ -		
lot size in acres	5.00		3.92	$ 8,000.00		at $8,000/ac
lot description	mature lot, some trees		mature lot, some trees	$ -		
home style	2 sty- farmhouse		2 sty- farmhouse	$ -		
exterior siding	vinyl		vinyl	$ -		
home built/eff age	1901/30 yrs		1901/25 yrs	$ (12,900.00)		used total economic life = 55 yrs
condition	average		average	$ -		
room count	8 total/4 br/2bth		7 total/3 br/1 bath	$ 3,000.00		$3,000 for full bath
GLA in sf	2,000		1,936	$ -		no adjustment needed, very similar in size
basement	full- unfinished		partial- unfinished	$ -		no adjustment needed, similar in use, old basement
patio/deck/porch	cov porch		wood deck	$ -		wood deck = covered porch
fireplace	none		heatilator system	$ (2,000.00)		
central air	none		none	$ -		
garage	none		2 car detached w/game room	$ (12,000.00)		$12,000 contribution value for garage w/14x21 game room
outbuildings	36x120 metal sided shed with heat and bathroom, 36x140 metal sided shed, 50x55 metal sided barn, 28x33 corn crib		40x50 metal sided machine shed	$ 14,000.00		36x140 building old chicken coop= $3,000, 36x120 building has work shop w/bathroom = $18,000, 50x55 barn = $5,000, corn crib is Quonset hut for storage= $3,000, 40x50 machine shed= $15,000
other	gravel drive		gravel drive	$ -		
total adjusted $				$ (1,900.00)		
total adjusted value (adj + adj sales price)		$ 145,200.00		$ 181,100.00		
difference in value in $					$(35,900.00)	
difference in value in %					-25%	overall impact due to presence of wind turbines/farm

No Sales within the Zero Zone

It was interesting to note that there were no residential sales (outside of the Village of Ohio) from January 1, 2011, to July 1, 2015, that was located in the Zero Zone (that zone within the perimeter of the wind farm). Traveling through this area indicated that there were plenty of residential homes, some on larger farm plots and some on smaller residential lots less than 10 acres. It appeared the density of these residential properties were similar to the outside zones (1-mile Zone, 3-mile Zone) yet there were no sales. There appears to be no explanation for this lack of sales activity in an area of 22,400 acres. The lack of sales is interesting and possibly instructive to the impact that wind turbines have on property value. It may suggest that when a property is inside the wind farm it is either not marketable or the property is receiving an income due to the wind turbines that the owner does not want to relinquish. It should be noted that since we have no sales nor did not engage in an in-depth study as to the cause of the lack of sales, any statement on our part the reason is a theory.

Summary of Findings

This analysis through five match pairs indicated that the impact of wind turbines on residential property value is negative ranging from -12% to -25% of the whole property value. The average loss indicated was -19%. The distance of the wind turbines ranged from 0.32 miles to 1.72 miles with the average being 0.65 miles. It was also indicated that often when the wind turbines are not clearly seen from the property that they have little impact on the property value. Now, this conclusion may run counter to the noise, vibration and health concerns, but it may also be true that those issues are only discovered after the sale and hence do not play a part of it.

It was also discovered that there were no sales found within the perimeters of the Big Sky Wind Farm using MRED and Zillow sources, which may indicate that such properties have suffered substantial value loss that it is not viable to sell them (possibly hold and rent).

Twin Groves II Wind Farm –Residential Paired Sales Analysis

Introduction

We completed an impact study to isolate the impact that a wind farm has on improved residential property value located in within and outside of the Twin Groves II wind farm. We attempted to include vacant residential land, however, we found only one land sale in the wind farm, so we excluded this type from the analysis.

The Farm

The wind farm that was selected was the Twin Groves II wind farm located in McLean County, Illinois. This wind farm was selected due to its size, contemporary wind turbines and an adequate number of sales within the identified wind farm.

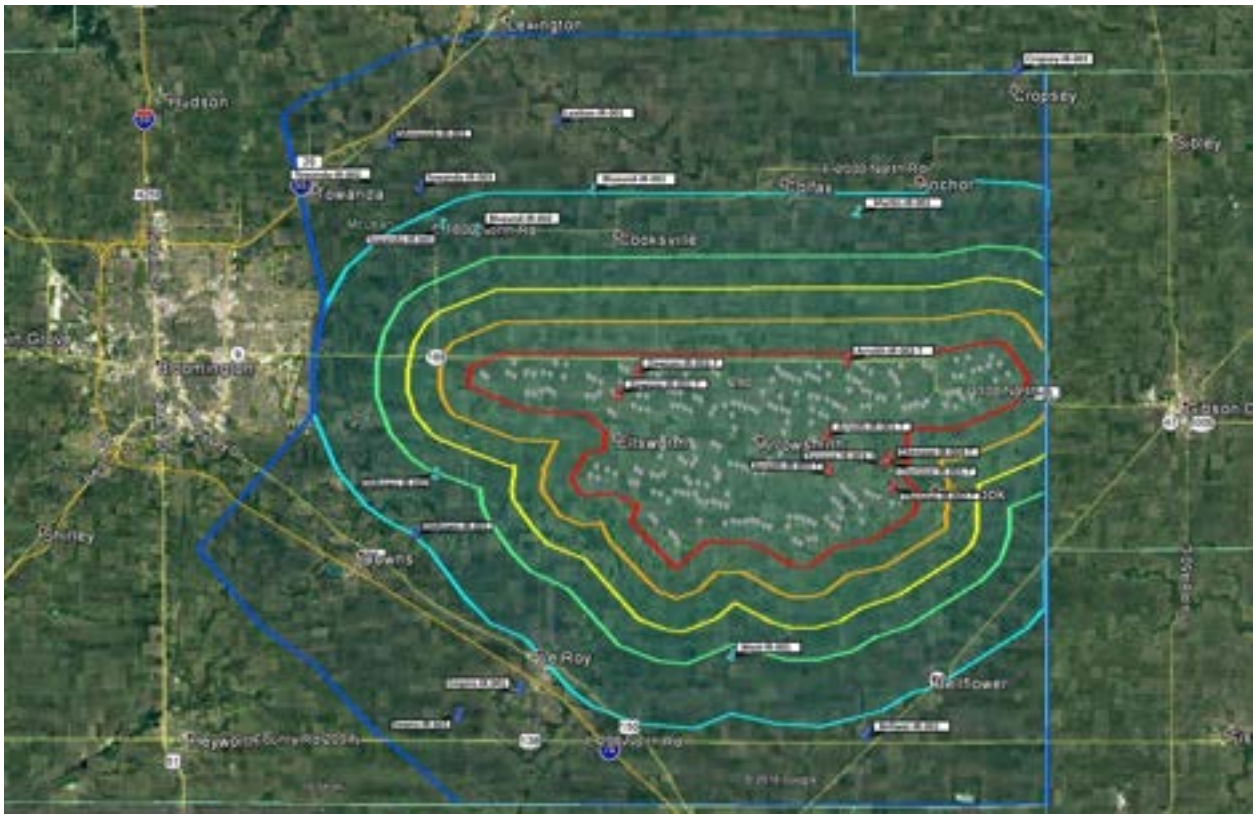
The details of the Twin Grove II wind farm are found in the chart below:

Name	Twin Groves II
Location	McLean County, Illinois, Townships of Arrowsmith, Cheney's Grove and Dawson.
Land area	11,000 acres (approximately half of the two wind farms Twin Groves I & II)
Date of operation	2008
Number of wind turbines	120 wind turbines
Type of wind turbines	Vestas V82 1.65 MW Wind Turbines *(picture on next page)*
Size in kW of wind turbines	1.65MW each x 120 turbines = 198MW
Hub height of wind turbines	80m (280ft±)
Diameter of Turbine	82.0m (269ft±)
Turbine height	Hub ht + ½ diameter of rotors = 80m + ½ (82m)= 121m (397ft±)
Maximum MW output	Approximately 198MW

Scope of Work

The scope of work to complete this study included:

- Research, collect data and confirm information regarding the Twin Groves II wind farm.
- Locating the wind farm on Google Pro mapping software, locate all the wind turbines within the wind farm and create the wind farm zone and concentric 1-mile zones radiating out from the farm to locate comparable sales as indicated on the map *(see next page for working map)*.
- Research and collect sales of improved residential properties within the wind farm, Zone 0.
- Research and collect sales of comparable improved residential sales in Zones 1-5.
- Collect sales data, property data and assessor's data on all sales.



Visit each sale Figure 4: the red line outlines the wind farm Zone-0, orange line is Zone-1, yellow line is Zone-2, green line is Zone 3, light blue line is Zone 4 which has a two-mile width and the dark blue line is Zone 5 which has a five-mile width.

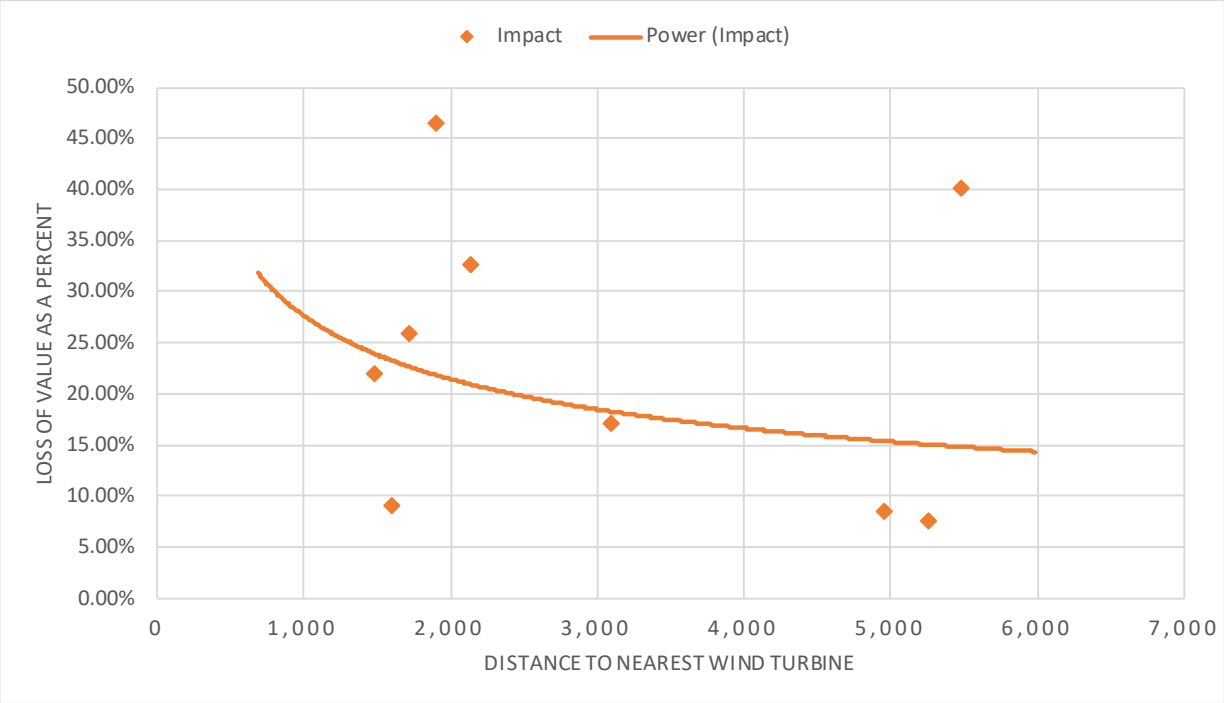
- on-site, take photographs, make field notes and try to confirm sale with the current property owner.
- Send confirmation requests to those sales not confirm in the field.
- Collect sales and support data from the McLean County Court House.
- Complete sales information data sheets.
- Complete a cost approach for each sale using the Marshall & Swift Cost Handbook and Valuation Service.
- Extract Effective Age of each sale using the Cost Approach.
- Complete Paired Sales analysis for each comparable Zone 0 sale.
- Extract the impact of the wind farm from the Paired Sales analysis.
- Using mapping services, locate the nearest wind turbines to each Zone 0 sale, map them and measure the distance from the turbine to the residence.
- Complete a sales map for each Zone 0 Paired Sales analysis.

Conclusions

The conclusions of the nine paired sales are found in the following table:

Pairing	Impact	Type of Residence	Gross Living Area	Age (year built)	Distance to nearest wind turbine
C	-22.0%	Ranch	1,858 sf	1987	1,483 ft
D	-7.7%	One story	2,290 sf	1992	5,259 ft
E	-46.6%	One story	2,089 sf	2008	1,896 ft
F	-25.9%	1.5 story	1,100 sf	1909	1,722 ft
G	-8.5%	Two story	2,271 sf	2001	4,950 ft
H	-40.2%	Tri-level	1,901 sf	1977	5,481 ft
I	-32.8%	Two story	1,728 sf	1880	2,129 ft
J	-17.2%	Two story	2,016 sf	1911	3,094 ft
K	-9.2%	Two story	2,054 sf	1920	1,591 ft

This table was put into the following graph to test if distance had a factor in the impact:



This chart clearly indicates that there is a relationship between distance from a wind turbine and impact to value that a wind turbine causes. It can be said with confidence, that the closer a wind turbine is to a residence the greater negative impact it has on value.

The location map, the analysis, corresponding cost approach and sales sheets for each Paired Analysis follows.

Paired Sale Group C

Paired Sales Analysis- Group C					
		Dawson-IR-001-T	Oldtown-IR-001	Martin-IR-001	Towanda-IR-001
address		12348N 2800 East Road	22286 Ridgewood Drive	18368 N 3600 East Road	17797 N2300 East Road
Municipality/County		Dawson Township	Old Town Township	Martin Township	Towanda Township
Sale Price		$219,000.00	$304,500.00	$312,000.00	$285,000.00
Sale Date		May 15, 2017	August 31, 2016	August 31, 2017	November 3, 2017
time in months		Base	9	-4	-6
time adj per year		0.0%	0.00%	0.00%	0.00%
Adj Sales Price			$304,500.00	$312,000.00	$285,000.00
lot size description	acres	2.12	5.86	3.21	7.59
	land=	$44,500.00	$99,600.00	$64,200.00	$91,100.00
adjustment			($55,100.00)	($19,700.00)	($46,600.00)
neighborhood location		Wind Farm- Zone 0	Non-wind farm	Non-wind farm	Non-wind farm
adjustment			$0.00	$0.00	$0.00
style		ranch	ranch	1-sty	1-sty
age		1987	1974	1993	1991
effective age		24	25	24	24
percent adj of residence			2%	0%	0%
adjustment			$3,600.00	$0.00	$0.00
exterior siding		vinyl	wood/brick	brick & vinyl	brick
quality of construction		average	average	average	average
room count	total	unknown	8	unknown	unknown
	BRs	3	4	4	3
	baths	2	3	2.5	2.5
GLA	in sq.ft.	1,858	2,304	2,458	1,911
contribution value $/sf			$62.34	$60.85	$66.26
adjustment	$/sf base		($27,800.00)	($36,500.00)	($3,500.00)
basement		1858	2304	2458	1911
portion finished in sf		500	1728	1980	0
contribution value $/sf			$7.00	$7.00	$7.00
adjustment			($8,600.00)	($10,400.00)	$3,500.00
garage		725	576	576	600
contribution value		$15,000.00	$9,000.00	$9,000.00	$10,000.00
adjustment			$ 6,000.00	$ 6,000.00	$ 5,000.00
porches, decks		wd deck, encl porch	encl por, porch, wd deck	wd deck, porch	wd deck, porch
contribution value		$10,000.00	$8,000.00	$7,000.00	$3,000.00
adjustment			$ 2,000.00	$ 3,000.00	$ 7,000.00
Other		concrete & gravel drive	gravel drive	gravel drive	gravel drive
		hot tub	shed	pole building	detached garage
		1,380sf lean to			machine shed
		2,208 pole building			grain bins
		3,500 machine shed			
		fire pit			
		18ft dia pool			
		fencing			
contribution value		$49,900.00	$6,400.00	$39,400.00	$31,700.00
			$ 43,500.00	$ 10,500.00	$ 18,200.00
Total Adjustments			($36,400)	($47,100)	($16,400)
Indicated value if Not in Wind Farm			**$268,100**	**$264,900**	**$268,600**
Concluded Value of Subject if Not in Wind Farm Zone		**$267,200**			
Sale Price of Subject		$219,000			
Difference in dollars		($48,200)			
Difference as precentage		**-22.0%**			
distance to nearest wind turbine		1,483	ft		
number of turbines in group sight		5			
furtherst wind turbine in grouping		2,849	ft		

Sale #	Dawson-IR-001-T				
Description	**area**		**$/area**		**$ sub-total**
GLA	1,858	sf	$ 109.78	/sf	$ 203,978.11
basement	1858	sf	$ 24.72	/sf	$ 45,927.12
garage	725	sf	$ 35.50	/sf	$ 25,737.02
wood deck	320	sf	$ 14.56	/sf	$ 4,658.41
enclosed porch	252	sf	$ 53.51	/sf	$ 13,483.58
		sf	$ -	/sf	$ -
Total Cost New					$ 293,784.24
Less Depreciation:					
Physical Depreciation				44%	$ 128,196.76
Effective Age:	*24*	*years*			
Total Economic Life:	*55*	*years*			
Depreciated value of structures:					$ 165,587.48
Functional Obsolescence				0%	$ -
Reason: none					
Economic Obsolescence				14%	$ 41,487.48
Reason: within windfarm					

Contribution (depreciated) value of building:	$ 124,100.00
Contribution (depreciated) value of outbuildings	$ 39,900.00
Plus, contribution value of site improvements	$ 10,500.00
Land value	$ 44,500.00
TOTAL (rounded)	**$ 219,000.00**

Sale #	Oldtown-IR-001		
Description	**area**	**$/area**	**$ sub-total**
GLA	2,304 sf	$ 114.72 /sf	$ 264,310.41
basement	2,304 sf	$ 30.41 /sf	$ 70,071.49
garage	576 sf	$ 28.36 /sf	$ 16,332.50
enclosed porch	160 sf	$ 63.87 /sf	$ 10,218.57
open porch	56 sf	$ 20.75 /sf	$ 1,162.26
wood deck	144 sf	$ 22.16 /sf	$ 3,190.73
Total Cost New			$ 365,285.97

Less Depreciation:			
Physical Depreciation		46%	$ 166,785.97
Effective Age:	*25*	*years*	
Total Economic Life:	*55*	*years*	
Depreciated value of structures:			$ 198,500.00
Functional Obsolescence		0%	$ -
Reason: none			
Economic Obsolescence		0%	$ -
Reason: none			

Contribution (depreciated) value of building:	$ 198,500.00
Contribution (depreciated) value of outbuildings	$ 1,400.00
Plus, contribution value of site improvements	$ 5,000.00
Land value	$ 99,600.00
TOTAL (rounded)	**$ 304,500.00**

Sale #	Martin-IR-001				
Description	**area**		**$/area**	**$ sub-total**	
GLA	2,458	sf	$ 108.40 /sf	$ 266,456.91	
basement	2,458	sf	$ 31.13 /sf	$ 76,508.28	
garage	576	sf	$ 28.12 /sf	$ 16,197.80	
wood deck	288	sf	$ 14.56 /sf	$ 4,192.57	
Covered porch	288	sf	$ 27.36 /sf	$ 7,880.01	
		sf	/sf	$ -	
Total Cost New				$ 371,235.57	
Less Depreciation:					
Physical Depreciation			44%	$ 162,835.57	
Effective Age:	*24*	*years*			
Total Economic Life:	*55*	*years*			
Depreciated value of structures:				$ 208,400.00	
Functional Obsolescence			0%	$ -	
Reason: none					
Economic Obsolescence			0%	$ -	
Reason: none					
Contribution (depreciated) value of building:					$ 208,400.00
Contribution (depreciated) value of outbuildings					$ 33,400.00
Plus, contribution value of site improvements					$ 6,000.00
Land value					$ 64,200.00
TOTAL (rounded)					**$ 312,000.00**

Sale #	Towanda-IR-001				
Description	**area**		**$/area**	**$ sub-total**	
GLA	1,911	sf	$ 118.62 /sf	$ 226,689.42	
basement	1,911	sf	$ 20.40 /sf	$ 38,991.92	
garage	600	sf	$ 30.99 /sf	$ 18,591.55	
wood deck	192	sf	$ 19.64 /sf	$ 3,771.63	
porch - open	72	sf	$ 32.74 /sf	$ 2,357.27	
		sf	/sf	$ -	
Total Cost New				$ 290,401.80	
Less Depreciation:					
Physical Depreciation			44%	$ 128,201.80	
Effective Age:	*24*	*years*			
Total Economic Life:	*55*	*years*			
Depreciated value of structures:				$ 162,200.00	
Functional Obsolescence			0%	$ -	
Reason: none					
Economic Obsolescence			0%	$ -	
Reason: none					
Contribution (depreciated) value of building:					$ 162,200.00
Contribution (depreciated) value of outbuildings					$ 25,700.00
Plus, contribution value of site improvements					$ 6,000.00
Land value					$ 91,100.00
TOTAL (rounded)					**$ 285,000.00**

Sale Date	Sale Price
May 15, 2017	$219,000
Gross Living Area (sf)	**GLA Price per sf**
1,858	$117.87
Lot Size (acre)	**Lot Price per acre**
2.120	$103,302

SALE: Dawson-IR-001-T

Located at:	12348 N 2800 East Road
Municipality:	Dawson Township
County:	McLean, IL
Parcel No.:	23-10-400-002
Grantor:	Brian & Melinda Kagel
Grantee:	Ryan Root
Recording Doc:	2017-00008863
Document type:	Warranty Deed
Zoning:	A - Agriculture
Use:	Agricultural

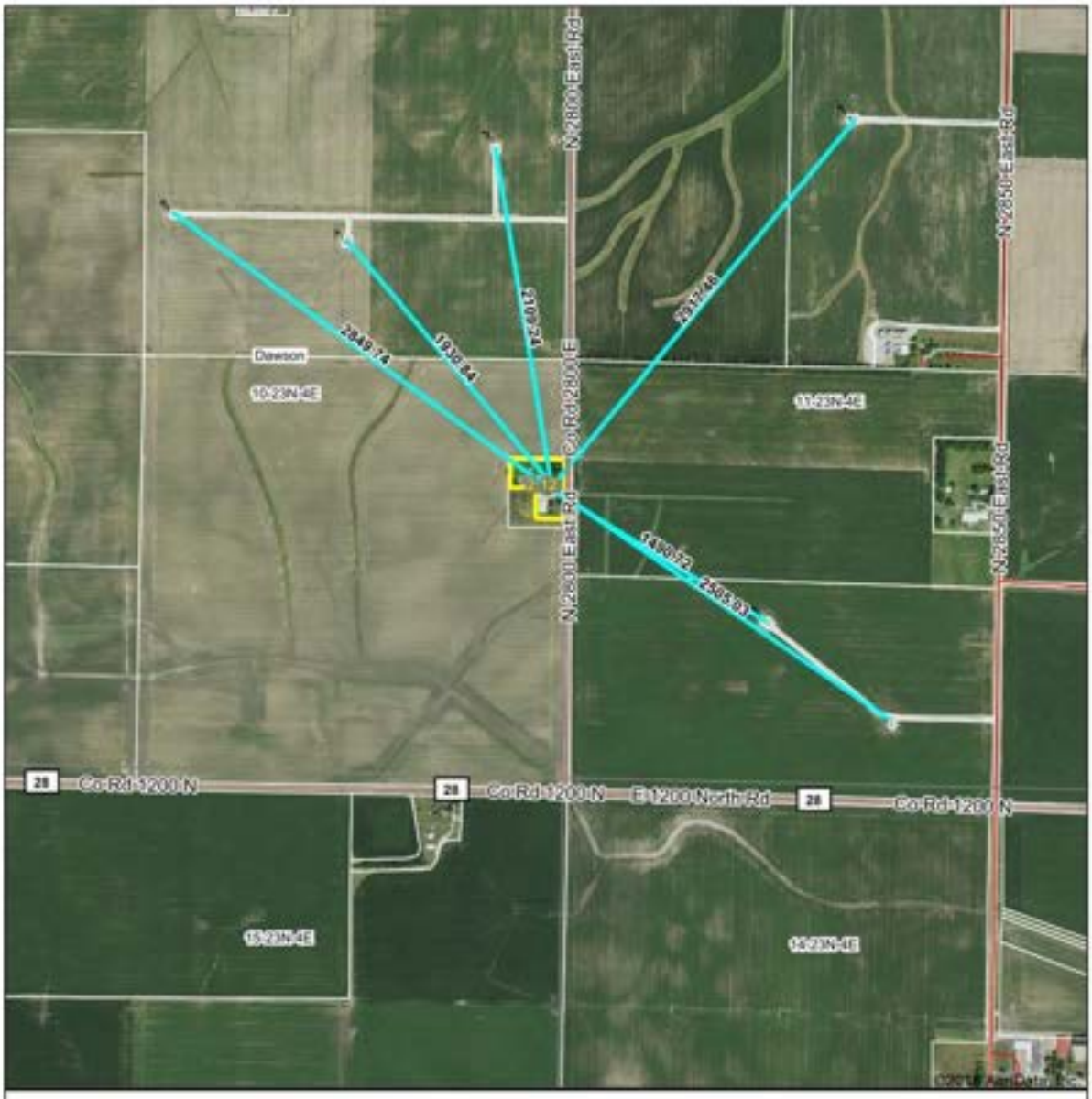
Land	Topography:	open: 83%	wooded: 17%	wetlands: 0%	FEMA/FIRM Floodplain: 0%	
	Terrain:	Level	Type of land use present in area:	Agricultural, rural residential	Water Feature:	None
	Landscaping:	Average	Landscaping Observations:	Lawn, mature trees, shade trees; ornamental bushes		
Improvements	Style/story:	1 story	Exterior siding:	Vinyl	Year Built:	1987
	Construction Quality:	Average	Basement Type:	Full w/crawl space	FBLA (sf):	500sf±
	# Garage spaces:	2	Garage Type:	725sf attached & insulated	Driveway type:	Concrete & gravel
	Room Count:	N/A 3 2	Fireplace:	Natural fireplace	Porches/ Patios/Decks	320sf deck, 252sf enclosed porch
	Central Air:	Yes Heating:	LP gas FHA & Corn Burner Stove	Road Frontage: County road		
	# of Outbuildings:	3 Outbuilding Descriptions:	1,380sf lean-to, 2,208sf pole building with 2 insulated stalls, 3,500sf machine shed with 30'x30' heated concrete floor		Overall Condition:	Average

Additional Observations:	**Land:** The property has a level contour. The property lies in Flood Zone X, an area of minimal flood hazard, within FIRM Panel #17113C0575E, effective 07-16-2008. **Improvements:** 18' swimming pool, hot tub hook up, fire pit, well septic system/private well. **Verification Comments:** The buyer Ryan Root, stated by questionnaire that he did not know the previous owner, the sale price was fair, and that the sale price was negotiated down from the asking price. The seller, Brian Kagel stated by questionnaire that the sale price was fair, and the buyer approached with an offer**.** The closest wind turbine that is in the view from this property is approximately 1,490.72 linear feet to the southeast.
Site Inspected by:	James Marske — Date of Inspection: May 17, 2018

Figure 5: View of residence with Wind Turbine figuring prominently, looking northwesterly from across 2800 East Road.

Figure 6: View of Wind Turbines located across N 2800 East Road looking southeasterly from the driveway.

Proximity to closest Wind Turbine - 1,490.72 linear feet



Field borders provided by Farm Service Agency as of 5/21/2008. Soils data provided by University of Illinois at Champaign-Urbana.

SALE: Martin-IR-001

Sale Date	Sale Price
July 29, 2016	$312,000
Gross Living Area (sf)	**GLA Price per sf**
2,458	$126.93
Lot Size (acre)	**Lot Price per acre**
3.210	$97,196

Located at:	18368 N 3600 East Road
Municipality:	Martin Township
County:	McLean, IL
Parcel No.:	17-12-400-012
Grantor:	Curt B. & Sue Ann Heimer
Grantee:	Reed & Lindsey Rinkenberger
Recording Doc:	2016-00014717
Document type:	Warranty Deed
Zoning:	A – Agriculture
Use:	Residential

Land	Topography:	Open: 93%	Wooded: 7%	Wetlands: 0%	FEMA/FIRM Floodplain: 0%	
	Terrain:	Gently Rolling	Type of land use present in area:	Rural Residential, Agricultural	Water Feature:	None
	Landscaping:	Average	Landscaping Observations:	Lawn, mature trees, shade trees; ornamental bushes		
Improvements	Style/story:	1 story	Exterior siding:	Brick & Vinyl	Year Built:	1993
	Construction Quality:	Average	Basement Type:	Full	FBLA (sf):	1980sf
	# Garage spaces:	2	Garage Type:	576sf attached	Driveway type:	Gravel with concrete apron
	Room Count:	4 / 2.5	Fireplace:	Natural fireplace with stone hearth	Porches/ Patios/Decks	288sf deck, 288sf open porch
	Central Air:	Yes	Heating: LP gas FHA	Road Type: County road		
	# of Outbuildings:	1	Outbuilding Descriptions:	4,320sf pole building	Overall Condition:	Average

Additional Observations:	**Land:** The property has a gently rolling contour. The property lies in Flood Zone X, an area of minimal flood hazard, within FIRM Panel #17113C0390E, effective 07-16-2008. **Improvements:** Private well/septic system, newer kitchen updates, main floor carpet and paint recently updated. Circular gravel driveway. **Verification Comments:** Owner not present at the time of inspection, questionnaires returned unanswered.
Site Inspected by:	James Marske — Date of Inspection: May 17, 2018

Sale Date	Sale Price
August 31, 2016	$304,500
Gross Living Area (sf)	**GLA Price per sf**
2,304	$132.16
Lot Size (acre)	**Lot Price per acre**
5.860	$51,962

SALE: Oldtown-IR-001

Located at:	22286 Ridgewood Drive
Municipality:	Old Town Township
County:	McLean, IL
Parcel No.:	22-35-300-012
Grantor:	Jason W. Proehl
Grantee:	Paul J. & Jill M. Messamore
Recording Doc:	2016-00016839
Document type:	Warranty Deed
Zoning:	A – Agriculture
Use:	Residential

Land	Topography:	open: 54%	wooded: 46%	wetlands: 0%	FEMA/FIRM Floodplain: 0%	
	Terrain:	Gently Rolling	Type of land use present in area:	Rural Residential, Agricultural	Water Feature:	None
	Landscaping:	Average	Landscaping Observations:	Lawn, mature trees, shade trees; ornamental bushes, landscaping site improvements, mulch beds		
Improvements	Style/story:	1 story w/walkout	Exterior siding:	Wood & Brick	Year Built:	1974
	Construction Quality:	Average	Basement Type:	Full w/crawl space	FBLA (sf):	1,728sf
	# Garage Spaces:	2.5	Garage Type:	576sf attached	Driveway type:	Gravel
	Room Count:	8 / 4 / 3	Fireplace:	2 natural fireplaces	Porches/ Patios/Decks	160sf enclosed porch, 56sf open porch, 144sf deck
	Central Air:	Yes	Heating:	Forced air, 2 fireplaces	Road Frontage	Town Road
	# of Outbuildings:	1	Outbuilding Descriptions:	280sf shed	Overall Condition:	Average

Additional Observations:	**Land:** The property lies at 840ft to 862ft above sea level. The property lies in Flood Zone X, an area of minimal flood hazard, within FIRM Panel #17113C0550E, effective 07-16-2008. Property located at the end of a rural cul-de-sac. **Improvements:** Private well/septic system, New 50-year roof installed in 2015. Vaulted ceilings, hardwood floors. Basement is mostly finished with a full bathroom. **Verification Comments:** The seller Jason W. Proehl, stated by questionnaire that he knew the buyer as a friendly acquaintance, the sale price was fair, and that the sale price was the asking price.
Site Inspected by:	James Marske — Date of Inspection: May 17, 2018

Sale Date	Sale Price
November 3, 2017	$285,000
Gross Living Area (sf)	**GLA Price per sf**
1,911	$149.14
Lot Size (acre)	**Lot Price per acre**
7.590	$37,549

SALE: Towanda-IR-001

Located at:	17797 N 2300 East Road
Municipality:	Towanda Township
County:	McLean, IL
Parcel No.:	15-13-100-005
Grantor:	Armstrong Construction Co.
Grantee:	Joseph D. Snodgrass
Recording Doc:	2017-00020701
Document type:	Warranty Deed
Zoning:	A - Agriculture
Use:	Agricultural

Land	Topography:	open: 87%	wooded: 13%	wetlands: 0%	FEMA/FIRM Floodplain: 0%	
	Terrain:	Level to Gently Rolling	Type of land use present in area:	Agricultural	Water Feature:	None
	Landscaping:	Average	Landscaping Observations:	45+ tree apple orchard, Lawn, mature trees, shade trees		
Improvements	Style/story:	1 story	Exterior siding:	Brick	Year Built:	1991
	Construction Quality:	Average	Basement Type:	Full	FBLA (sf):	0
	# Garage spaces:	2	Garage Type:	600sf attached	Driveway type:	Gravel
	Room Count:	N/A 3 2.5	Fireplace:	Wood burning stove	Porches/ Patios/Decks	192sf deck, 72sf open porch
	Central Air:	Yes	Heating:	Forced Air	Road Frontage	US Highway
	# of Outbuildings:	2	Outbuilding Descriptions:	704sf garage, 1,536sf metal shed, 2 4,000 BU Bins	Overall Condition:	Average

Additional Observations:	**Land:** The property lies at 804ft to 816t above sea level. The property lies in Flood Zone X, an area of minimal flood hazard, within FIRM Panel #17113C0350E, effective 07-16-2008. **Improvements:** Private well/septic system. Above ground pool. **Verification Comments:** Owner not present at the time of inspection, questionnaires returned unanswered.

Site Inspected by:	James Marske	Date of Inspection:	May 17, 2018

Paired Sale Group D

Paired Sales Analysis- Group D			
		Chenove-IR-001-T	Bellwer-IR-001
address		10402 Feather Lane	22286 Ridgewood Drive
Municipality/County		Cheneys Grove Township	Bellflower Township
Sale Price		$162,000.00	$150,000.00
Sale Date		August 18, 2017	July 20, 2016
time in months		Base	13
time adj per year		0.0%	0.00%
Adj Sales Price			$150,000.00
lot size description	acres	1.01	2.32
	land=	$40,400.00	$60,300.00
adjustment			($19,900.00)
neighborhood location		Wind Farm- Zone 0	Non-wind farm
adjustment			$0.00
style		one story	one story
age		1992	1976
effective age		25	41
percent adj of residence			29%
adjustment			$24,000.00
exterior siding		vinyl	brick
quality of construction		average	average
room count	total	unknown	unknown
	BRs	3	3
	baths	2.5	2
GLA	in sq.ft.	2,290	2,212
contribution value $/sf			$29.02
adjustment			$2,300.00
basement		2290	2212
portion finished in sf		390	0
contribution value $/sf			$0.00
adjustment			$3,900.00
garage size in sf		565	780
contribution value		$9,000.00	$6,000.00
adjustment			$ 3,000.00
porches, decks		cov porch, open porch	wood deck
contribution value		$10,000.00	$1,000.00
adjustment			$ 9,000.00
Other		blacktop paved drive	asphalt & concrete drive
		storage shed (80sf)	storage shed (100sf)
		average landscaping	average landscaping
contribution value		$9,400.00	$7,300.00
			$ 2,100.00
Total Adjustments			$24,400
Indicated value if Not in Wind Farm			**$174,400**
Concluded Value of Subject if Not in Wind Farm Zone		**$174,400**	
Sale Price of Subject		$162,000	
Difference in dollars		($12,400)	
Difference as percentage		**-7.7%**	
distance to nearest wind turbine		5,259	ft
number of turbines in group sig		1	
furthest wind turbine in groupi		5,259	ft

Sale #	Chenove-IR-001-T				
Description	**area**		**$/area**		**$ sub-total**
GLA	2,290	sf	$ 106.66	/sf	$ 244,255.34
basement	2290	sf	$ 23.96	/sf	$ 54,865.07
garage	565	sf	$ 28.12	/sf	$ 15,888.47
covered porch	510	sf	$ 27.36	/sf	$ 13,954.19
porch	230	sf	$ 15.55	/sf	$ 3,576.83
		sf	$ -	/sf	$ -
Total Cost New					$ 332,539.90
Less Depreciation:					
Physical Depreciation				45%	$ 151,154.50
Effective Age:	*25*	*years*			
Total Economic Life:	*55*	*years*			
Depreciated value of structures:					$ 181,385.40
Functional Obsolescence				0%	$ -
Reason: none					
Economic Obsolescence				21%	$ 69,185.40
Reason: within windfarm					

Contribution (depreciated) value of building:	$ 112,200.00
Contribution (depreciated) value of outbuildings	$ 400.00
Plus, contribution value of site improvements	$ 9,000.00
Land value	$ 40,400.00
TOTAL (rounded)	**$ 162,000.00**

Sale #	Bellwer-IR-001				
Description	**area**		**$/area**	**$ sub-total**	
GLA	2,212 sf		$ 112.74 /sf	$ 249,385.25	
basement	2,212 sf		$ 20.09 /sf	$ 44,435.17	
garage	780 sf		$ 29.23 /sf	$ 22,800.96	
wood deck	160 sf		$ 22.16 /sf	$ 3,545.26	
	sf		/sf	$ -	
	sf		/sf	$ -	
Total Cost New				$ 320,166.64	
Less Depreciation:					
Physical Depreciation			74%	$ 237,766.64	
Effective Age:	*41*	*years*			
Total Economic Life:	*55*	*years*			
Depreciated value of structures:				$ 82,400.00	
Functional Obsolescence			0%	$ -	
Reason: none					
Economic Obsolescence			0%	$ -	
Reason: none					
Contribution (depreciated) value of building:					$ 82,400.00
Contribution (depreciated) value of outbuildings					$ 300.00
Plus, contribution value of site improvements					$ 7,000.00
Land value					$ 60,300.00
TOTAL (rounded)					**$ 150,000.00**

SALE: Bellwer-IR-001

Sale Date	Sale Price
July 20, 2016	$150,000
Gross Living Area (sf)	**GLA Price per sf**
2,212	$67.81
Lot Size (acre)	**Lot Price per acre**
2.320	$64,655

Located at:	36215 E 200 North Road
Municipality:	Bellflower Township
County:	McLean, IL
Parcel No.:	39-06-100-004
Grantor:	D. Darwin Builta & Rebecca Builta
Grantee:	Eric A. Sommer
Recording Doc:	2016-00013649
Document type:	Warranty Deed
Zoning:	A – Agriculture
Use:	Rural Residential

Land	Topography:	open: 88%	wooded: 12%	wetlands: 0%	FEMA/FIRM Floodplain: 0%	
	Terrain:	Level	Type of land use present in area:	Rural Residential/Agricultural	Water Feature:	None
	Landscaping:	Average	Landscaping Observations:	Lawn, mature trees, shade trees; ornamental bushes		
Improvements	Style/story:	1 story	Exterior siding:	Brick	Year Built:	1976
	Construction Quality:	Average	Basement Type:	Full	FBLA (sf):	0
	# Garage spaces:	2.5	Garage Type:	780sf attached	Driveway type:	Asphalt and concrete
	Room Count:	N/A N/A 2	Fireplace:	None	Porches/ Patios/Decks	160sf deck
	Central Air:	Yes	Heating:	LP gas FHA	Road Frontage	US Highway
	# of Outbuildings:	1	Outbuilding Descriptions:	Utility shed (100sf)	Overall Condition:	Average

Additional Observations:	**Land:** The property lies at 695ft to 705ft above sea level. The property lies in Flood Zone X, an area of minimal flood hazard, within FIRM Panel #17147C0025E, effective 06-16-2011. **Improvements:** well/septic system. **Verification Comments:** Owner not present at time of inspection, questionnaires returned unanswered.
Site Inspected by:	James Marske — Date of Inspection: May 17, 2018

Sale Date	Sale Price
August 18, 2017	$162,000
Gross Living Area (sf)	**GLA Price per sf**
2,290	$70.74
Lot Size (acre)	**Lot Price per acre**
1.010	$160,396

SALE: Chenove-IR-001-T

Located at:	10402 Feather Lane
Municipality:	Cheneys Grove Township
County:	McLean, IL
Parcel No.:	25-19-280-007
Grantor:	Donald E. & Mildred I. Alexander
Grantee:	Brian Huang & Stacey Johnson
Recording Doc:	2017-00015564
Document type:	Warranty Deed
Zoning:	R-1 - Residential
Use:	Residential

Land	Topography:	open: 90%	wooded: 10%	wetlands: 0%	FEMA/FIRM Floodplain: 0%	
	Terrain:	Level to Gently Rolling	Type of land use present in area:	Rural Residential & Agricultural	Water Feature:	Creek/stream
	Landscaping:	Average	Landscaping Observations:	Lawn, mature trees, shade trees; ornamental bushes		
Improvements	Style/story:	1 story	Exterior siding:	Vinyl	Year Built:	1992
	Construction Quality:	Average	Basement Type:	Full	FBLA (sf):	390sf
	# Garage Spaces:	2	Garage Type:	656sf attached	Driveway type:	Asphalt
	Room Count:	N/A 3 2.5	Fireplace:	Natural fireplace	Porches/ Patios/Decks	230sf open porch, 510sf covered porch
	Central Air:	Yes	Heating:	LP gas FHA	Road Frontage	Town street
	# of Outbuildings:	1	Outbuilding Descriptions:	Storage shed (80sf)	Overall Condition:	Average

Additional Observations:	**Land:** The property has a level to gently rolling contour. The property lies in Flood Zone X, an area of minimal flood hazard, within FIRM Panel #17113C0600E, effective 07-16-2008. The property lies at the end of a cul-de-sac. **Improvements: S**eptic system/private well. Un-obstructed view of wind turbines from the back yard of a residence. **Verification Comments:** The buyer Brian Huang, stated by questionnaire and in person that he did not know the previous owner, the sale price was fair, and that the sale price was accepted after the seller approached with an offer. Mr. Huang stated that the view of wind turbines from his property did not impact property value in his opinion. The closest wind turbine that is in the view from this property is approximately 5,298.53ft± to the southwest.

Site Inspected by:	James Marske	Date of Inspection:	May 17, 2018

Figure 7: View of wind turbine looking southwesterly from the edge of the driveway.

Figure 8: View of residence looking southwesterly from the edge of the driveway.

Proximity to closest Wind Turbine - 5,298.53 linear feet

map center: 40° 25' 37.29, -88° 33' 18.74

0ft 1237ft 2474ft

30-23N-6E
McLean County
Illinois

N W E S

7/10/2018

Maps Provided By surety © Agridata, Inc. 2018 www.AgriDataInc.com

Field borders provided by Farm Service Agency as of 5/21/2008. Soils data provided by University of Illinois at Champaign-Urbana.

Paired Sale Group E

Paired Sales Analysis- Group E			
		Chenove-IR-002-T	Lexiton-IR-001
address		9697 N 3725 East Road	21213 N 2650 East
Municipality/County		Cheneys Grove Township	Lexington Township
Sale Price		$199,900.00	$267,500.00
Sale Date		September 28, 2017	June 28, 2016
time in months		Base	15
time adj per year		0.0%	0.00%
Adj Sales Price			$267,500.00
lot size description	acres	1.12	4.15
	land=	$44,800.00	$66,400.00
adjustment			($21,600.00)
neighborhood location		Wind Farm- Zone 0	Non-wind farm
adjustment			$0.00
style		one story	one story
age		2008	2001
effective age		9	17
percent adj of residence			15%
adjustment			$28,300.00
exterior siding		vinyl	vinyl/brick face
quality of construction		average	average
room count	total	unknown	unknown
	BRs	4	3
	baths	2	2
GLA	in sq.ft.	2,089	1,929
contribution value $/sf			$78.80
adjustment			$12,600.00
basement		2089	1929
portion finished in sf		0	0
contribution value $/sf			$0.00
adjustment			$0.00
garage		672	465
contribution value		$15,000.00	$10,000.00
adjustment			$5,000.00
porches, decks		covered porch (299sf)	2 open porches, wood deck
contribution value		$7,000.00	$6,000.00
adjustment			$1,000.00
Other		concrete & gravel	concrete & gravel drive
		storage shed (100sf)	storage shed (120sf)
		average landscaping	average landscaping
contribution value		$6,600.00	$6,400.00
			$200.00
Total Adjustments			$25,500
Indicated value if Not in Wind Farm			**$293,000**
Concluded Value of Subject if Not in Wind Farm Zone		**$293,000**	
Sale Price of Subject		$199,900	
Difference in dollars		($93,100)	
Difference as percentage		**-46.6%**	

Sale #	Chenove-IR-002-T				
Description	**area**		**$/area**		**$ sub-total**
GLA	2,089	sf	$ 106.76	/sf	$ 223,011.75
basement	2089	sf	$ 20.40	/sf	$ 42,623.82
garage	672	sf	$ 27.36	/sf	$ 18,386.69
covered porch	299	sf	$ 27.36	/sf	$ 8,180.98
		sf		/sf	$ -
		sf	$ -	/sf	$ -
Total Cost New					$ 292,203.25
Less Depreciation:					
Physical Depreciation				16%	$ 46,752.52
Effective Age:	*9*	*years*			
Total Economic Life:	*55*	*years*			
Depreciated value of structures:					$ 245,450.73
Functional Obsolescence				0%	$ -
Reason: none					
Economic Obsolescence				33%	$ 96,950.73
Reason: within windfarm					

Contribution (depreciated) value of building:	$ 148,500.00
Contribution (depreciated) value of outbuildings	$ 600.00
Plus, contribution value of site improvements	$ 6,000.00
Land value	$ 44,800.00
TOTAL (rounded)	**$ 199,900.00**

Sale #	Lexiton-IR-001		
Description	**area**	**$/area**	**$ sub-total**
GLA	1,929 sf	$ 114.79 /sf	$ 221,426.47
basement	1,929 sf	$ 20.40 /sf	$ 39,359.19
garage	465 sf	$ 29.84 /sf	$ 13,875.61
open porch	55 sf	$ 20.75 /sf	$ 1,141.51
open porch	72 sf	$ 19.06 /sf	$ 1,372.27
wood deck	550 sf	$ 11.69 /sf	$ 6,431.04
Total Cost New			$ 283,606.09

Less Depreciation:			
Physical Depreciation		31%	$ 88,906.09
Effective Age:	*17*	*years*	
Total Economic Life:	*55*	*years*	
Depreciated value of structures:			$ 194,700.00
Functional Obsolescence		0%	$ -
Reason: none			
Economic Obsolescence		0%	$ -
Reason: none			

Contribution (depreciated) value of building:	$ 194,700.00
Contribution (depreciated) value of outbuildings	$ 400.00
Plus, contribution value of site improvements	$ 6,000.00
Land value	$ 66,400.00
TOTAL (rounded)	**$ 267,500.00**

Sale Date	Sale Price
September 28, 2017	$199,900
Gross Living Area (sf)	**GLA Price per sf**
2,089	$95.69
Lot Size (acre)	**Lot Price per acre**
1.120	$178,482

SALE: Chenove-IR-002-T

Located at:	9697 N 3725 East Road
Municipality:	Cheneys Grove Township
County:	McLean, IL
Parcel No.:	25-29-100-007
Grantor:	Jody Hall a/k/a Jodi Hall
Grantee:	Gary Kiel
Recording Doc:	2017-00018325
Document type:	Warranty Deed
Zoning:	A - Agriculture
Use:	Rural Residential

Land	Topography:	open: 100%	wooded: 0%	wetlands: 0%	FEMA/FIRM Floodplain: 0%	
	Terrain:	Level to Gently Rolling	Type of land use present in area:	Rural Residential & Agricultural	Water Feature:	None
	Landscaping:	Average	Landscaping Observations:	Lawn, mature trees, shade trees; ornamental bushes		
Improvements	Style/story:	1 story	Exterior siding:	Vinyl	Year Built:	2008
	Construction Quality:	Average	Basement Type:	Full	FBLA (sf):	0
	# Garage Spaces:	2	Garage Type:	672sf attached	Driveway type:	Concrete and gravel
	Room Count:	N/A 4 2	Fireplace:	-	Porches/ Patios/Decks	299.3sf covered porch
	Central Air:	Yes	Heating:	LP gas FHA	Road Frontage	County road
	# of Outbuildings:	1	Outbuilding Descriptions:	Storage shed (100sf±)	Overall Condition:	Average

Additional Observations:	**Land:** The property has a level to gently rolling contour. The property lies in Flood Zone X, an area of minimal flood hazard, within FIRM Panel #17113C0600E, effective 07-16-2008. **Improvements:** private well/septic system, partial fencing, new steel roof, newer air conditioner, and furnace. **Verification Comments:** The buyer Gary Kiel, stated in person that he did not know the previous owner, the sale price was fair, and that the sale price was negotiated down from the asking price. He also stated that he did not believe that wind turbines had an impact on property value. The closest wind turbine that is in the view from this property is approximately 1,879.70ft± to the southeast.

Site Inspected by:	James Marske	Date of Inspection:	May 17, 2018

Figure 9: View of residence looking southeasterly from northern driveway entrance.

Figure 10: View of residence looking easterly from northern driveway entrance.

Proximity to closest Wind Turbine - 1,879.70 linear feet

map center: 40° 25' 16.43, -88° 33' 15.72

0ft 1198ft 2395ft

29-23N-6E
McLean County
Illinois

Maps Provided By surety
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N W E S

7/10/2018

Field borders provided by Farm Service Agency as of 5/21/2008. Soils data provided by University of Illinois at Champaign-Urbana.

SALE: Martin-IR-001

Sale Date	Sale Price
July 29, 2016	$312,000
Gross Living Area (sf)	**GLA Price per sf**
2,458	$126.93
Lot Size (acre)	**Lot Price per acre**
3.210	$97,196

Located at:	18368 N 3600 East Road
Municipality:	Martin Township
County:	McLean, IL
Parcel No.:	17-12-400-012
Grantor:	Curt B. & Sue Ann Heimer
Grantee:	Reed & Lindsey Rinkenberger
Recording Doc:	2016-00014717
Document type:	Warranty Deed
Zoning:	A – Agriculture
Use:	Residential

Land	Topography:	Open: 93%	Wooded: 7%	Wetlands: 0%	FEMA/FIRM Floodplain: 0%	
	Terrain:	Gently Rolling	Type of land use present in area:	Rural Residential, Agricultural	Water Feature:	None
	Landscaping:	Average	Landscaping Observations:	Lawn, mature trees, shade trees; ornamental bushes		
Improvements	Style/story:	1 story	Exterior siding:	Brick & Vinyl	Year Built:	1993
	Construction Quality:	Average	Basement Type:	Full	FBLA (sf):	1980sf
	# Garage spaces:	2	Garage Type:	576sf attached	Driveway type:	Gravel with concrete apron
	Room Count:	4 / 2.5	Fireplace:	Natural fireplace with stone hearth	Porches/ Patios/Decks	288sf deck, 288sf open porch
	Central Air:	Yes	Heating: LP gas FHA	Road Type: County road		
	# of Outbuildings:	1	Outbuilding Descriptions:	4,320sf pole building	Overall Condition:	Average

Additional Observations:	**Land:** The property has a gently rolling contour. The property lies in Flood Zone X, an area of minimal flood hazard, within FIRM Panel #17113C0390E, effective 07-16-2008. **Improvements:** Private well/septic system, newer kitchen updates, main floor carpet and paint recently updated. Circular gravel driveway. **Verification Comments:** Owner not present at the time of inspection, questionnaires returned unanswered.
Site Inspected by:	James Marske — Date of Inspection: May 17, 2018

Paired Sale Group F

Paired Sales Analysis- Group F				
		Arroith-IR-001-T	Blueund-IR-001	Towanda-IR-003
address		11365 N 3500 East Road	27607 E 1900 North Road	22416 E1900 North Road
Municipality/County		Arrowsmith Township	Blue Mound Township	Towanda Township
Sale Price		$107,900.00	$172,000.00	$150,000.00
Sale Date		May 30, 2017	April 26, 2017	March 31, 2017
time in months		Base	1	2
time adj per year		0.0%	0.00%	0.00%
Adj Sales Price			$172,000.00	$150,000.00
lot size description	acres	0	1.81	1.23
	land=	$54,100.00	$36,200.00	$39,400.00
adjustment			$17,900.00	$14,700.00
neighborhood location		Wind Farm- Zone 0	Non-wind farm	Non-wind farm
adjustment			$0.00	$0.00
style		1.5 sty	1.5 sty	1.5 sty
age		1909	1909	1911
effective age		28	28	29
percent adj of residence			0%	2%
adjustment			$0.00	$1,900.00
exterior siding		vinyl	vinyl	wood
quality of construction		average	average	average
room count	total	unknown	unknown	unknown
	BRs	3	unknown	3
	baths	1	1	1
GLA	in sq.ft.	1,100	1,748	1,928
contribution value $/sf			$49.46	$47.83
adjustment	$/sf base		($32,100.00)	($39,600.00)
basement		748	952	0
portion finished in sf		0	0	0
contribution value $/sf			$0.00	$0.00
adjustment			$0.00	$0.00
garage		576	468	360
contribution value		$10,000.00	$8,000.00	$7,000.00
adjustment			$2,000.00	$3,000.00
porches, decks		wd deck, encl porch	cov porch, open porch, deck	wd deck, porch
contribution value		$6,000.00	$5,000.00	$5,000.00
adjustment			$1,000.00	$1,000.00
Other		gravel drive	gravel drive	depreciated asphalt drive
		landscaping	landscaping	landscaping
			pole shed 3,024sf	fencing
				pole shed 846sf
contribution value		$5,500.00	$24,400.00	$6,600.00
			($18,900.00)	($1,100.00)
Total Adjustments			($30,100)	($20,100)
Indicated value if Not in Wind Farm			**$141,900**	**$129,900**
Concluded Value of Subject if Not in Wind Farm Zone		**$135,900**		
Sale Price of Subject		$107,900		
Difference in dollars		($28,000)		
Difference as percentage		**-25.9%**		

Sale #	Arroith-IR-001-T				
Description	**area**		**$/area**		**$ sub-total**
GLA	1,100	sf	$ 102.31	/sf	$ 112,543.20
basement	748	sf	$ 25.20	/sf	$ 18,848.09
garage	576	sf	$ 34.20	/sf	$ 19,700.03
wood deck	168	sf	$ 22.16	/sf	$ 3,722.52
covered porch	264	sf	$ 29.88	/sf	$ 7,887.03
		sf	$ -	/sf	$ -
Total Cost New					$ 162,700.87
Less Depreciation:					
Physical Depreciation				51%	$ 82,829.53
Effective Age:	*28*	*years*			
Total Economic Life:	*55*	*years*			
Depreciated value of structures:					$ 79,871.34
Functional Obsolescence				0%	$ -
Reason: none					
Economic Obsolescence				19%	$ 31,571.34
Reason: within windfarm					

Contribution (depreciated) value of building:	$ 48,300.00
Contribution (depreciated) value of outbuildings	$ -
Plus, contribution value of site improvements	$ 5,500.00
Land value	$ 54,100.00
TOTAL (rounded)	**$ 107,900.00**

Sale #	Blueund-IR-001		
Description	**area**	**$/area**	**$ sub-total**
GLA	1,748 sf	$ 100.15 /sf	$ 175,060.16
basement	952 sf	$ 23.79 /sf	$ 22,652.70
garage	468 sf	$ 36.54 /sf	$ 17,100.72
covered porch	144 sf	$ 32.04 /sf	$ 4,613.51
open porch	220 sf	$ 15.55 /sf	$ 3,421.31
wood deck	110 sf	$ 24.67 /sf	$ 2,713.90
Total Cost New			$ 225,562.30

Less Depreciation:			
Physical Depreciation		51%	$ 114,162.30
Effective Age:	*28*	*years*	
Total Economic Life:	*55*	*years*	
Depreciated value of structures:			$ 111,400.00
Functional Obsolescence		0%	$ -
Reason: none			
Economic Obsolescence		0%	$ -
Reason: none			

Contribution (depreciated) value of building:	$ 111,400.00
Contribution (depreciated) value of outbuildings	$ 18,400.00
Plus, contribution value of site improvements	$ 6,000.00
Land value	$ 36,200.00
TOTAL (rounded)	**$ 172,000.00**

Sale #	Towanda-IR-003		
Description	**area**	**$/area**	**$ sub-total**
GLA	1,928 sf	$ 101.48 /sf	$ 195,656.93
basement	- sf	$ - /sf	$ -
garage	360 sf	$ 39.76 /sf	$ 14,311.99
enclosed porch	128 sf	$ 83.53 /sf	$ 10,692.27
	- sf	$ - /sf	$ -
	sf	/sf	$ -
Total Cost New			$ 220,661.19

Less Depreciation:			
Physical Depreciation		53%	$ 116,661.19
Effective Age:	*29*	*years*	
Total Economic Life:	*55*	*years*	
Depreciated value of structures:			$ 104,000.00
Functional Obsolescence		0%	$ -
Reason: none			
Economic Obsolescence		0%	$ -
Reason: none			

Contribution (depreciated) value of building:	$ 104,000.00
Contribution (depreciated) value of outbuildings	$ 2,600.00
Plus, contribution value of site improvements	$ 4,000.00
Land value	$ 39,400.00
TOTAL (rounded)	**$ 150,000.00**

Sale Date	Sale Price
May 30, 2017	$107,900
Gross Living Area (sf)	**GLA Price per sf**
1,100	$98.09
Lot Size (acre)	**Lot Price per acre**
2.080	$51,875

SALE: Arroith-IR-001-T

Located at:	11365 N 3500 East Road
Municipality:	Arrowsmith Township
County:	McLean, IL
Parcel No.:	24-13-300-008 & 24-13-300-010
Grantor:	Dane M. & Andrea Murray
Grantee:	Raymond F. Loftus
Recording Doc:	2017-00009650
Document type:	Warranty Deed
Zoning:	A – Agriculture
Use:	Rural Residential

Land	Topography:	open: 91%	wooded: 9%	wetlands: 0%	FEMA/FIRM Floodplain: 0%	
	Terrain:	Gently Rolling	Type of land use present in area:	Rural Residential, Agricultural	Water Feature:	None
	Landscaping:	Average	Landscaping Observations:	Lawn, mature trees, shade trees; ornamental bushes		
Improvements	Style/story:	1.5 story	Exterior siding:	Vinyl	Year Built:	1880
	Construction Quality:	Average	Basement Type:	Crawl space	FBLA (sf):	0
	# Garage Spaces:	2.5	Garage Type:	576sf detached	Driveway type:	Gravel
	Room Count:	N/A 3 1	Fireplace:	-	Porches/ Patios/Decks	264sf covered porch, 168sf deck
	Central Air:	No	Heating: LP gas FHA	Road Frontage: County road		
	# of Outbuildings:	0	Outbuilding Descriptions:	--	Overall Condition:	Average

Additional Observations:	**Land:** The property has a gently rolling contour. The property lies in Flood Zone X, an area of minimal flood hazard, within FIRM Panel #17113C0600E, effective 07-16-2008. **Improvements:** Private well/septic system, hardwood floors throughout**,** newer roof, windows, and garage. **Verification Comments:** The buyer Raymond Loftus, stated in person that he did not know the previous owner, the sale price was fair, and that the sale price was negotiated down from the asking price. He also stated that he did not believe that wind turbines had an impact on property value. The closest wind turbine that is in the view from this property is approximately 1,721.21ft± to the west.
Site Inspected by:	James Marske — Date of Inspection: May 17, 2018

Figure 11: View of Wind Turbines located across N 3500 East Road, looking westerly from residence driveway.

Figure 12: View of Wind Turbines looking northeasterly from the southern end of the property.

Aerial Map

map center: 40° 26' 46.34, -88° 35' 30.53

0ft 988ft 1975ft

13-23N-5E
McLean County
Illinois

N W E S

7/11/2018

Maps Provided By surety

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Field borders provided by Farm Service Agency as of 5/21/2008. Soils data provided by University of Illinois at Champaign-Urbana.

SALE: Blueund-IR-001

Sale Date	Sale Price
April 26, 2017	$172,000
Gross Living Area (sf)	**GLA Price per sf**
1,748	$98.40
Lot Size (acre)	**Lot Price per acre**
1.810	$95,028

Located at:	27607 E 1900 North Road
Municipality:	Blue Mound Township
County:	McLean, IL
Parcel No.:	16-10-200-004
Grantor:	Scott A. & Pamela L. Hardman
Grantee:	Ryan Thedens & Patricia Billingsley
Recording Doc:	2017-00008512
Document type:	Warranty Deed
Zoning:	A – Agriculture
Use:	Rural Residential

Land	Topography:	open: 77%	wooded: 23%	wetlands: 0%	FEMA/FIRM Floodplain: 0%	
	Terrain:	Level	Type of land use present in area:	Rural Residential, Agricultural	Water Feature:	None
	Landscaping:	Average	Landscaping Observations:	Lawn, mature trees, shade trees; ornamental bushes		
Improvements	Style/story:	2 story	Exterior siding:	Vinyl	Year Built:	1909
	Construction Quality:	Average	Basement Type:	Full	FBLA (sf):	0
	# Garage Spaces:	2	Garage Type:	468sf detached	Driveway type:	Gravel
	Room Count:	N/A / N/A / 1	Fireplace:	No	Porches/ Patios/Decks	144sf covered porch, 220sf open porch, 110sf deck
	Central Air:	No	Heating: LP gas FHA	Road Type: County road		
	# of Outbuildings:	1	Outbuilding Descriptions:	3,024sf pole frame building	Overall Condition:	Average

Additional Observations:	**Land:** The property has a level contour. The property lies in Flood Zone X, an area of minimal flood hazard, within FIRM Panel #17113C0375E, effective 07-16-2008. **Improvements:** Well/septic system, oak wood cabinetry throughout the kitchen. 2 separate gravel driveways leading onto the property. **Verification Comments:** The buyer Patricia Billingsley, stated by a questionnaire that she knew the previous owner, that the final sale price was arrived at by prior contract and that the sale price was fair.
Site Inspected by:	James Marske — Date of Inspection: May 17, 2018

SALE: Towanda-IR-003

Sale Date	Sale Price
March 31, 2017	$150,000
Gross Living Area (sf)	**GLA Price per sf**
1,928	$77.80
Lot Size (acre)	**Lot Price per acre**
1.230	$121,951

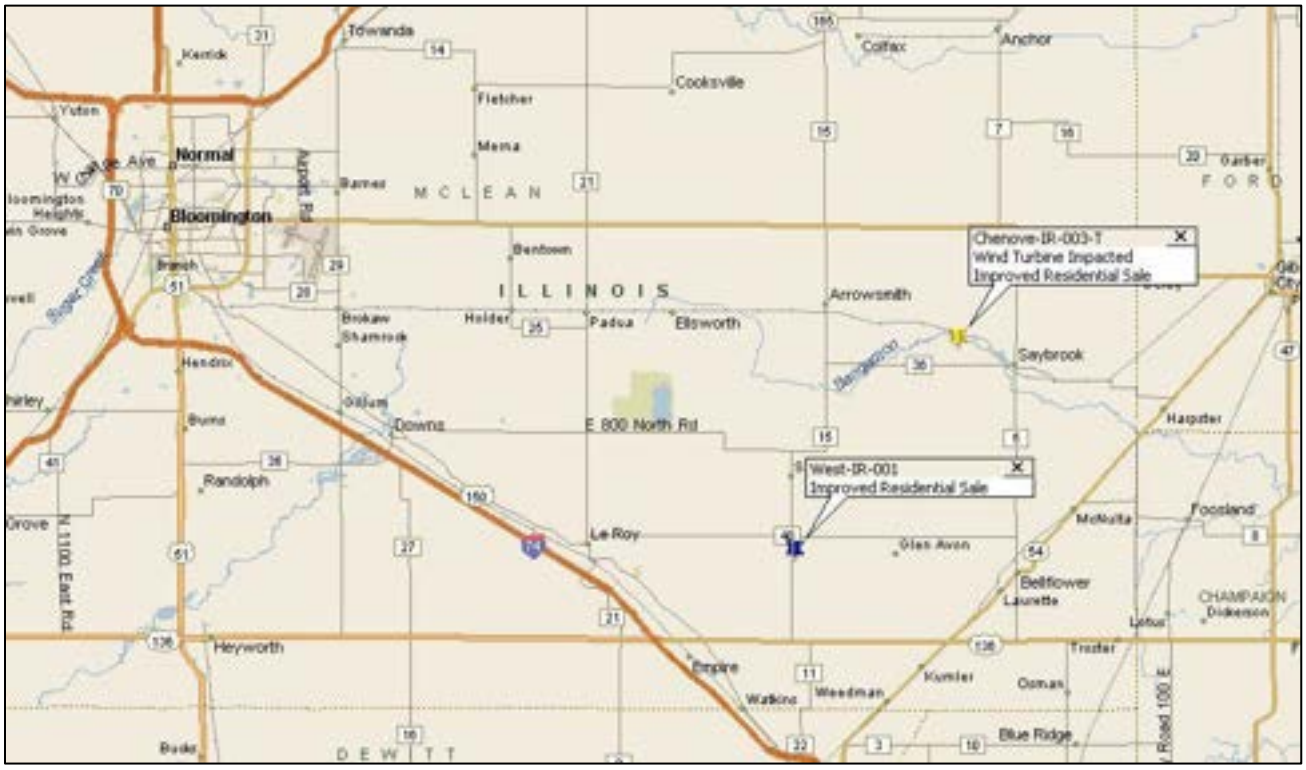
Located at:	22416 E 1900 North Road
Municipality:	Towanda Township
County:	McLean, IL
Parcel No.:	15-02-300-004
Grantor:	Peter D. & Patricia A. Cuoco
Grantee:	Lyle D. Gordon
Recording Doc:	2017-00005755
Document type:	Warranty Deed
Zoning:	A – Agriculture
Use:	Rural Residential

Land	Topography:	open: 93%	wooded: 7%	wetlands: 0%	FEMA/FIRM Floodplain: 0%	
	Terrain:	Level	Type of land use present in area:	Rural Residential/Agricultural	Water Feature:	None
	Landscaping:	Average	Landscaping Observations:	Lawn, mature trees, shade trees; ornamental bushes		
Improvements	Style/story:	1 story	Exterior siding:	Wood	Year Built:	1911
	Construction Quality:	Average	Basement Type:	Crawl space	FBLA (sf):	None
	# Garage spaces:	1	Garage Type:	360sf detached	Driveway type:	Asphalt (old and cracked)
	Room Count:	N/A 3 1	Fireplace:	Wood burning stove	Porches/ Patios/Decks	128sf enclosed porch
	Central Air:	No	Heating:	LP gas FHA	Road Frontage	State Highway
	# of Outbuildings:	1	Outbuilding Descriptions:	4-sided metal 864sf shed (24' X 36')	Overall Condition:	Average

Additional Observations:	**Land:** The property lies at 788ft to 792ft above sea level. The property lies in Flood Zone X, an area of minimal flood hazard, within FIRM Panel #17113C0350E, effective 07-16-2008. **Improvements:** Septic system/private well, ceiling fan with lighting throughout the residence. Partially fenced yard. **Verification Comments:** The seller Peter Cuoco, stated by a questionnaire that he did not know the buyer, the sale price was fair, and that the sale price was negotiated down from the asking price.

Site Inspected by:	James Marske	Date of Inspection:	May 17, 2018

Paired Sale Group G



Paired Sales Analysis- Group G			
		Chenove-IR-003-T	West-IR-001
address		37253 Comache Drive	4397 N 3200 East Road
Municipality/County		Cheneys Grove Township	West Township
Sale Price		$172,000.00	$143,500.00
Sale Date		May 18, 2017	September 27, 2017
time in months		Base	-4
time adj per year		0.0%	0.00%
Adj Sales Price			$143,500.00
lot size description	acres	0.72	1.50
	land=	$34,600.00	$48,000.00
adjustment			($13,400.00)
neighborhood location		Wind Farm- Zone 0	Non-wind farm
adjustment			$0.00
style		2 sty	2 sty
age		2001	1999
effective age		16	38
percent adj of residence			40%
adjustment			$31,600.00
exterior siding		vinyl	vinyl
quality of construction		average	average
room count	total	unknown	unknown
	BRs	3	4
	baths	2.5	2.5
GLA	in sq.ft.	2,271	2,058
contribution value $/sf			$30.49
adjustment	$/sf base		$6,500.00
basement		1489	1176
portion finished in sf		782	0
contribution value $/sf		$19.00	$0.00
adjustment			$14,900.00
garage		809	768
contribution value		$15,000.00	$6,000.00
adjustment			$9,000.00
porches, decks		wood deck	cov porch, open porch, deck
contribution value		$4,000.00	$2,000.00
adjustment			$2,000.00
Other		concrete driveway	gravel drive
		landscaping	landscaping
		outdoor cooking setup	pole shed 3,024sf
contribution value		$9,000.00	$16,400.00
			($7,400.00)
Total Adjustments			$43,200
Indicated value if Not in Wind Farm			**$186,700**
Concluded Value of Subject if Not in Wind Farm Zone		**$186,700**	
Sale Price of Subject		$172,000	
Difference in dollars		($14,700)	
Difference as percentage		**-8.5%**	

Sale #	Chenove-IR-003-T				
Description	**area**		**$/area**		**$ sub-total**
GLA	2,271	sf	$ 101.70	/sf	$ 230,969.73
basement (partly	1489	sf	$ 38.26	/sf	$ 56,967.42
garage	809	sf	$ 26.60	/sf	$ 21,520.31
wood deck	465	sf	$ 12.86	/sf	$ 5,980.87
	0	sf	$ -	/sf	$ -
		sf	$ -	/sf	$ -
Total Cost New					$ 315,438.31
Less Depreciation:					
Physical Depreciation				29%	$ 91,763.87
Effective Age:	*16*	*years*			
Total Economic Life:	*55*	*years*			
Depreciated value of structures:					$ 223,674.44
Functional Obsolescence				0%	$ -
Reason: none					
Economic Obsolescence				30%	$ 95,274.44
Reason: within windfarm					

Contribution (depreciated) value of building:	$ 128,400.00
Contribution (depreciated) value of outbuildings	$ -
Plus, contribution value of site improvements	$ 9,000.00
Land value	$ 34,600.00
TOTAL (rounded)	**$ 172,000.00**

Sale #	West-IR-001		
Description	**area**	**$/area**	**$ sub-total**
GLA	2,058 sf	$ 100.48 /sf	$ 206,780.08
basement	1,176 sf	$ 22.39 /sf	$ 26,332.65
garage	768 sf	$ 26.60 /sf	$ 20,429.66
concrete patio	480 sf	$ 6.31 /sf	$ 3,030.77
wood deck	240 sf	$ 17.09 /sf	$ 4,102.77
	- sf	$ - /sf	$ -
Total Cost New			$ 260,675.94

Less Depreciation:			
Physical Depreciation		70%	$ 181,575.94
Effective Age:	*38*	*years*	
Total Economic Life:	*55*	*years*	
Depreciated value of structures:			$ 79,100.00
Functional Obsolescence		0%	$ -
Reason: none			
Economic Obsolescence		0%	$ -
Reason: none			

Contribution (depreciated) value of building:	$ 79,100.00
Contribution (depreciated) value of outbuildings	$ 12,400.00
Plus, contribution value of site improvements	$ 4,000.00
Land value	$ 48,000.00
TOTAL (rounded)	**$ 143,500.00**

Sale Date	Sale Price
May 18, 2017	$172,000
Gross Living Area (sf)	**GLA Price per sf**
2,271	$75.74
Lot Size (acre)	**Lot Price per acre**
0.720	$238,889

SALE: Chenove-IR-003-T

Located at:	37253 Comanche Drive
Municipality:	Cheneys Grove Township
County:	McLean, IL
Parcel No.:	25-19-279-001
Grantor:	Marty & Teresa A. Benningfield
Grantee:	Daniel & Kelsey Kaeb
Recording Doc:	2017-00009122
Document type:	Warranty Deed
Zoning:	R-1 - Residential
Use:	Rural Residential

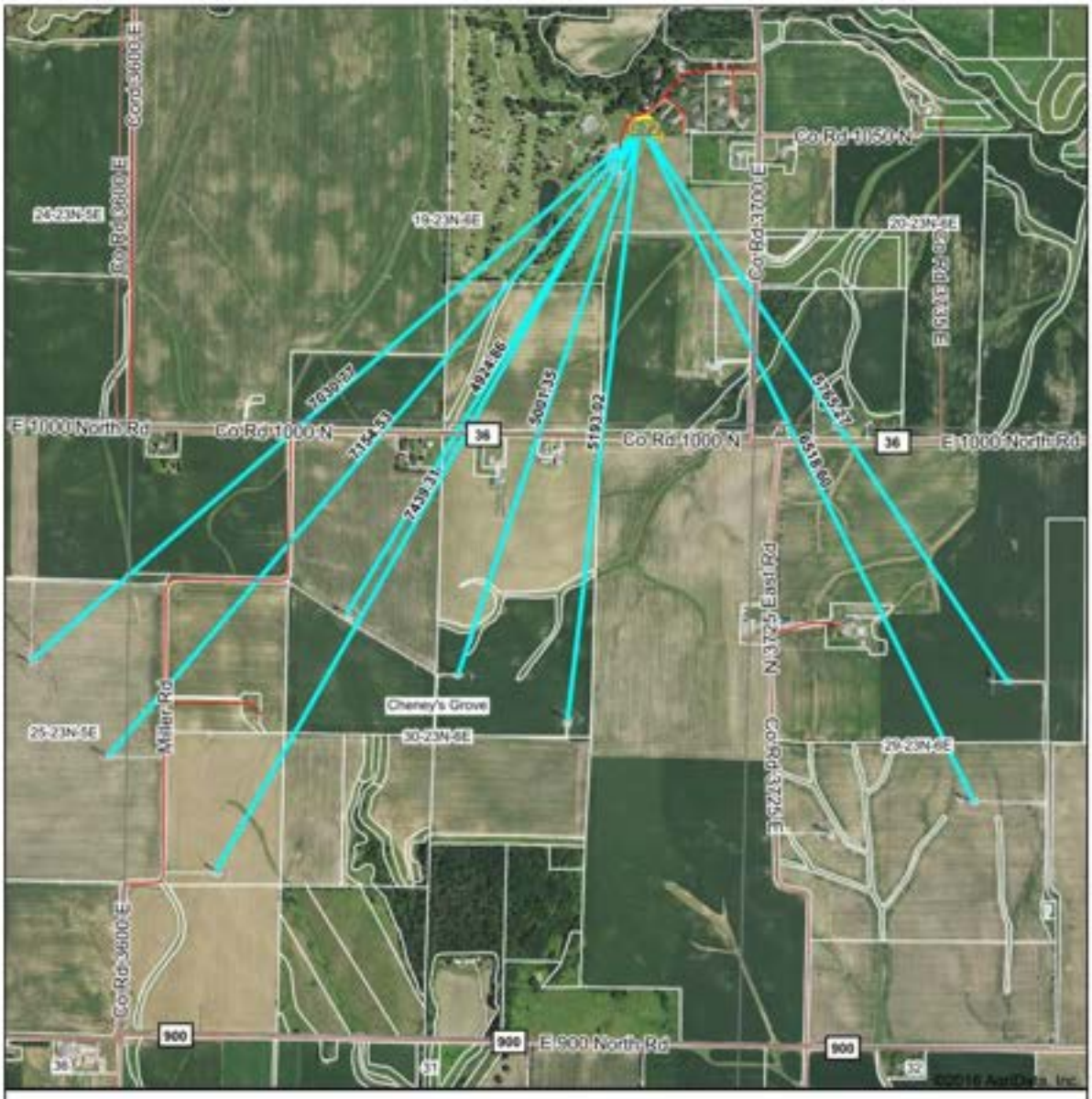
Land	Topography:	open: 98%	wooded: 2%	wetlands: 0%	FEMA/FIRM Floodplain: 0%	
	Terrain:	Level	Type of land use present in area:	Rural Residential & Agricultural	Water Feature:	None
	Landscaping:	Average	Landscaping Observations:	Lawn, mature trees, shade trees; ornamental bushes, stone beds, garden area		
Improvements	Style/story:	2 story	Exterior siding:	Vinyl	Year Built:	2001
	Construction Quality:	Average	Basement Type:	Full	FBLA (sf):	782sf (est.)
	# Garage spaces:	3	Garage Type:	809sf attached	Driveway type:	Concrete
	Room Count:	N/A 3 2.5	Fireplace:	Gas fireplace	Porches/ Patios/Decks	465sf wood deck
	Central Air:	Yes	Heating:	LP gas FHA	Road Frontage	Town street
	# of Outbuildings:	-	Outbuilding Descriptions:	-	Overall Condition:	Average

Additional Observations:	**Land:** The property has a level contour. The property lies in Flood Zone X, an area of minimal flood hazard, within FIRM Panel #17113C0600E, effective 07-16-2008. The property is located across the street from Indian Springs Golf Course, which attracts significant traffic. **Improvements:** Septic system/shared well, vaulted ceilings**,** unobstructed view of wind turbines from the backyard of the residence. **Verification Comments:** Owner not present at the time of inspection, questionnaires returned unanswered. The closest wind turbine that is in the view from this property is approximately 4,924.86ft± to the southwest.
Site Inspected by:	James Marske — Date of Inspection: May 17, 2018

Figure 13: View of Wind Turbine looking southeasterly from the driveway entrance of the residence.

Figure 14: View of Wind Turbines looking southeasterly from NW corner of the property.

Proximity to closest Wind Turbine - 4,924.86 linear feet



map center: 40° 25' 28.13, -88° 33' 40.5

0ft 1342ft 2684ft

30-23N-6E
McLean County
Illinois

N W E S

7/11/2018

Maps Provided By surety © Agridata, Inc. 2018 www.AgriDataInc.com

Field borders provided by Farm Service Agency as of 5/21/2008. Soils data provided by University of Illinois at Champaign-Urbana.

SALE: West-IR-001

Sale Date	Sale Price
September 27, 2017	$143,500
Gross Living Area (sf)	**GLA Price per sf**
2,058	$69.73
Lot Size (acre)	**Lot Price per acre**
1.500	$95,667

Located at:	4397 N 3200 East Road
Municipality:	West Township
County:	McLean, IL
Parcel No.:	31-21-301-007
Grantor:	Michael R. & Ruth Ann Martens
Grantee:	Megan Maher
Recording Doc:	2017-00017946
Document type:	Warranty Deed
Zoning:	A – Agriculture
Use:	Rural Residential

Land	Topography:	open: 67%	wooded: 33%	wetlands: 0%	FEMA/FIRM Floodplain: 0%	
	Terrain:	Level to Gently Rolling	Type of land use present in area:	Rural Residential/Agricultural	Water Feature:	None
	Landscaping:	Fair	Landscaping Observations:	Lawn, mature trees, shade trees; ornamental bushes		
Improvements	Style/story:	2 story	Exterior siding:	Vinyl	Year Built:	1999
	Construction Quality:	Average	Basement Type:	Full	FBLA (sf):	0
	# Garage Spaces:	3	Garage Type:	768sf attached	Driveway type:	Gravel driveway
	Room Count:	N/A 4 2.5	Fireplace:	No	Porches/ Patios/Decks	240sf deck, 480sf concrete patio
	Central Air:	Yes Heating:	LP gas FHA	Road Frontage: State Highway		
	# of Outbuildings:	2 Outbuilding Descriptions:	4-sided metal shed (616sf), detached garage (500sf)		Overall Condition:	Average

Additional Observations:	**Land:** The property lies at 720ft to 730ft above sea level. The property lies in Flood Zone X, an area of minimal flood hazard, within FIRM Panel #17113C0350E, effective 07-16-2008. **Improvements:** well/septic system, hardwood flooring. **Verification Comments:** Owner not present at the time of inspection, questionnaires returned unanswered.
Site Inspected by:	James Marske — Date of Inspection: May 17, 2018

Paired Sales Group H

Paired Sales Analysis- Group H			
		Chenove-IR-004-T	**Empire-IR-001**
address		37367 Comache Drive	25288 Chestnut Drive
Municipality/County		Cheneys Grove Township	Empire Township
Sale Price		$136,500.00	$220,000.00
Sale Date		April 1, 2016	June 7, 2017
time in months		Base	-14
time adj per year		0.0%	0.00%
Adj Sales Price			$220,000.00
lot size description	acres	0.62	1.75
	land=	$37,200.00	$49,000.00
adjustment			($11,800.00)
neighborhood location		Wind Farm- Zone 0	Non-wind farm
adjustment			$0.00
style		tri-level	tri-level
age		1977	1968
effective age		22	22
percent adj of residence			0%
adjustment			$0.00
exterior siding		vinyl & brick	vinyl & brick
quality of construction		average	average
room count	total	8	unknown
	BRs	4	4
	baths	2	3
GLA	in sq.ft.	1,901	1,938
contribution value $/sf			$65.68
adjustment	$/sf base		($2,400.00)
basement		529	650
portion finished in sf		0	0
contribution value $/sf		$0.00	$0.00
adjustment			$0.00
garage		576	621
contribution value		$10,000.00	$10,000.00
adjustment			$0.00
porches, decks		patio	cov porch, open porch, deck
contribution value		$1,000.00	$10,000.00
adjustment			($9,000.00)
Other		asphalt driveay	gravel drive
		lanscaping	landscaping
		utility shed	shed 784sf
contribution value		$6,900.00	$12,300.00
			($5,400.00)
Total Adjustments			($28,600)
Indicated value if Not in Wind Farm			**$191,400**
Concluded Value of Subject if Not in Wind Farm Zone		**$191,400**	
Sale Price of Subject		$136,500	
Difference in dollars		($54,900)	
Difference as precentage		**-40.2%**	

Sale #	Chenove-IR-004-T				
Description	**area**		**$/area**		**$ sub-total**
GLA	1,901	sf	$ 106.85	/sf	$ 203,119.58
basement	529	sf	$ 28.24	/sf	$ 14,937.96
garage	576	sf	$ 28.12	/sf	$ 16,197.80
patio	286	sf	$ 7.68	/sf	$ 2,197.10
	0	sf	$ -	/sf	$ -
		sf	$ -	/sf	$ -
Total Cost New					$ 236,452.44
Less Depreciation:					
Physical Depreciation				40%	$ 94,580.98
Effective Age:	*22*	*years*			
Total Economic Life:	*55*	*years*			
Depreciated value of structures:					$ 141,871.47
Functional Obsolescence				0%	$ -
Reason: none					
Economic Obsolescence				21%	$ 49,471.47
Reason: within windfarm					

Contribution (depreciated) value of building:	$ 92,400.00
Contribution (depreciated) value of outbuildings	$ 400.00
Plus, contribution value of site improvements	$ 6,500.00
Land value	$ 37,200.00
TOTAL (rounded)	**$ 136,500.00**

Sale #	Empire-IR-001		
Description	**area**	**$/area**	**$ sub-total**
GLA	1,938 sf	$ 109.40 /sf	$ 212,013.01
basement	650 sf	$ 28.24 /sf	$ 18,354.77
garage	621 sf	$ 28.12 /sf	$ 17,463.26
concrete patio	441 sf	$ 6.31 /sf	$ 2,784.52
wood deck	160 sf	$ 22.16 /sf	$ 3,545.26
screened porch	260 sf	$ 39.18 /sf	$ 10,187.47
Total Cost New			$ 264,348.29

Less Depreciation:			
Physical Depreciation		40%	$ 105,648.29
Effective Age:	*22*	*years*	
Total Economic Life:	*55*	*years*	
Depreciated value of structures:			$ 158,700.00
Functional Obsolescence		0%	$ -
Reason: none			
Economic Obsolescence		0%	$ -
Reason: none			

Contribution (depreciated) value of building:	$ 158,700.00
Contribution (depreciated) value of outbuildings	$ 5,800.00
Plus, contribution value of site improvements	$ 6,500.00
Land value	$ 49,000.00
TOTAL (rounded)	**$ 220,000.00**

Sale Date	Sale Price
April 1, 2016	$136,500
Gross Living Area (sf)	**GLA Price per sf**
1,901	$71.80
Lot Size (acre)	**Lot Price per acre**
0.620	$220,161

SALE: Chenove-IR-004-T

Located at:	37367 Comanche Drive
Municipality:	Cheneys Grove Township
County:	McLean, IL
Parcel No.:	25-19-280-002
Grantor:	Cheryl L. Burke
Grantee:	John E. Knerr II
Recording Doc:	2016-00005626
Document type:	Warranty Deed
Zoning:	R-1 - Residential
Use:	Rural Residential

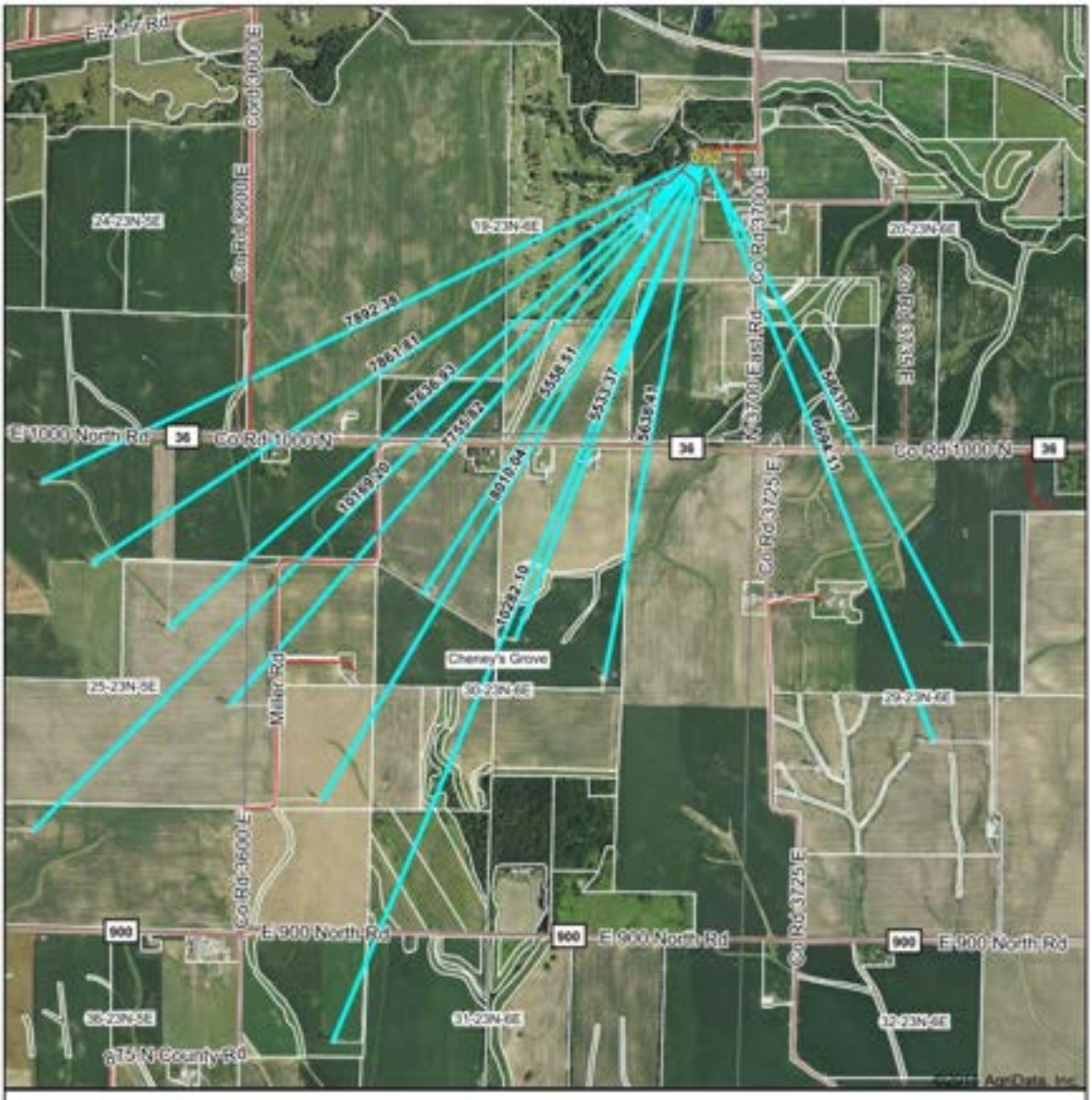
Land	Topography:	open: 71%	wooded: 29%	wetlands: 0%	FEMA/FIRM Floodplain: 0%	
	Terrain:	Level to Gently Rolling	Type of land use present in area:	Rural Residential & Agricultural	Water Feature:	Creek/stream
	Landscaping:	Average	Landscaping Observations:	Lawn, mature trees, shade trees; ornamental bushes		
Improvements	Style/story:	Tri-level	Exterior siding:	Brick/vinyl	Year Built:	1977
	Construction Quality:	Average	Basement Type:	Full w/crawl space	FBLA (sf):	0
	# Garage Spaces:	2	Garage Type:	576sf attached	Driveway type:	Asphalt
	Room Count:	8 / 4 / 2	Fireplace:	Natural fireplace (lower level)	Porches/ Patios/Decks	286sf concrete patio
	Central Air:	Yes	Heating:	LP gas FHA	Road Frontage	Town street
	# of Outbuildings:	1	Outbuilding Descriptions:	Utility shed (80sf)	Overall Condition:	Average

Additional Observations:	**Land:** The property has a level to gently rolling contour. The property lies in Flood Zone X, an area of minimal flood hazard, within FIRM Panel #17113C0600E, effective 07-16-2008. **Improvements:** Septic system/shared well, split level, basement has walkout doors to concrete patio, kitchen completely updated, newer roof and siding. Un-obstructed view of wind turbines from the backyard of residence. **Verification Comments:** Owner not present at the time of inspection, questionnaires returned unanswered. The closest wind turbine that is in the view from this property is approximately 5,533.37ft± to the southwest.
Site Inspected by:	James Marske — Date of Inspection: May 17, 2018

Figure 15: View of Wind Turbine looking southerly from driveway entrance.

Figure 16: View of residence looking southerly from Indian Spring Road.

Proximity to closest Wind Turbine - 5,533.37 linear feet



map center: 40° 25' 26.82, -88° 33' 46.08

0ft 1657ft 3314ft

30-23N-6E
McLean County
Illinois

7/11/2018

Field borders provided by Farm Service Agency as of 5/21/2008. Soils data provided by University of Illinois at Champaign-Urbana.

SALE: Empire-IR-001

Sale Date	Sale Price
June 7, 2017	$220,000
Gross Living Area (sf)	**GLA Price per sf**
1,938	$113.52
Lot Size (acre)	**Lot Price per acre**
1.750	$125,714

Located at:	25288 Chestnut Drive
Municipality:	Empire Township
County:	McLean, IL
Parcel No.:	30-29-300-004
Grantor:	Paul R. Belyea, Trustee
Grantee:	Christian W. Gallion
Recording Doc:	2017-00010396
Document type:	Warranty Deed
Zoning:	A – Agriculture
Use:	Rural Residential

Land	Topography:	open: 31%	wooded: 69%	wetlands: 10%	FEMA/FIRM Floodplain: 0%	
	Terrain:	Gently Rolling to Rolling	Type of land use present in area:	Rural Residential/Agricultural	Water Feature:	Salt Creek
	Landscaping:	Average	Landscaping Observations:	Lawn, mature trees, shade trees; ornamental bushes		
Improvements	Style/story:	Tri-level	Exterior siding:	Wood/brick	Year Built:	1968
	Construction Quality:	Average	Basement Type:	Full w/crawlspace	FBLA (sf):	0
	# Garage Spaces:	2	Garage Type:	621sf attached	Driveway type:	Asphalt and concrete
	Room Count:	N/A 4 3	Fireplace:	Natural fireplace with brick hearth	Porches/ Patios/Decks	Raised wood deck (160sf±), concrete patio (441sf±), enclosed screen porch (260sf±)
	Central Air:	Yes Heating:	LP FHA	Road Frontage	Town Road	
	# of Outbuildings:	1 Outbuilding Descriptions:	784sf 4-sided metal shed		Overall Condition:	Average

Additional Observations:	**Land:** The property lies at 745ft to 780ft above sea level. The property lies in Flood Zone X, an area of minimal flood hazard, within FIRM Panel #17113C0350E, effective 07-16-2008. There are freshwater forested/shrub wetlands areas located on the property. **Improvements:** well/septic system, basement has a walkout, concrete patio is located beneath an enclosed screen porch. **Verification Comments:** The seller Paul R. Belyea, stated by questionnaire that he did not know the buyer, the sale price was fair, and that the sale price was negotiated down from the asking price. The buyer Christian W. Gallion, stated by interview, that he did not know the seller, the sale price was fair, and that the sale price was negotiated down from the asking price. Mr. Gallion stated that he did not mind wind turbines. His wife stated that she hated the sound of wind turbines and would not live by them.
Site Inspected by:	James Marske — Date of Inspection: May 17, 2018

Paired Sales Group I

Paired Sales Analysis- Group I					
		Arroith-IR-002-T	Blueund-IR-002	Cropsey-IR-001	Moneeek-IR-001
address		13691 N 3550 East Road	17669 N 2400 East Road	22747 N 4100 East Road	20393 N 2150 East Road
Municipality/County		Arrowsmith Township	Blue Mound Township	Cropsey Township	Money Creek Township
Sale Price		$155,000.00	$174,000.00	$100,915.00	$160,000.00
Sale Date		October 10, 2017	July 20, 2016	August 19, 2016	February 8, 2017
time in months		Base	15	14	8
time adj per year		0.0%	0.00%	0.00%	0.00%
Adj Sales Price			$174,000.00	$100,915.00	$160,000.00
lot size description	acres	2.57	1.44	1.56	1.36
	land=	$59,100.00	$46,100.00	$49,900.00	$43,500.00
adjustment			$13,000.00	$9,200.00	$15,600.00
neighborhood location		Wind Farm- Zone 0	Non-wind farm	Non-wind farm	Non-wind farm
adjustment			$0.00	$0.00	$0.00
style		2 sty	2 sty	1.50 sty	1.5 sty
age		1880	1899	1901	1920
effective age		30	29	40	26
percent adj of residence			-2%	18%	-7%
adjustment			($2,000.00)	$8,400.00	($8,100.00)
exterior siding		metal	vinyl	vinyl	vinyl
quality of construction		average	average	average	average
room count	total	unknown	unknown	unknown	unknown
	BRs	3	4	3	3
	baths	2	1	2	1.5
GLA	in sq.ft.	1,728	1,658	1,408	1,815
contribution value $/sf			$46.86	$28.03	$49.75
adjustment	$/sf base		$3,300.00	$9,000.00	($4,300.00)
basement		1056	1074	1024	1112
portion finished in sf		0	256	0	0
contribution value $/sf			$7.00	$0.00	$0.00
adjustment			($1,800.00)	$0.00	$0.00
garage		888	704	0	360
contribution value		$10,000.00	$9,000.00	$0.00	$7,000.00
adjustment			$1,000.00	$10,000.00	$3,000.00
porches, decks		porch, cov porch, (2) encl por	enclosed porch	wood deck	(2) porches
contribution value		$14,000.00	$7,000.00	$1,000.00	$1,000.00
adjustment			$7,000.00	$13,000.00	$13,000.00
Other		gravel	gravel drive	gravel drive	gravel drive
		lanscaping	landscaping	landscaping (min)	landscaping
		detached garage (840sf)	pole barn (2,240sf)	utility shed (80sf)	
		machine shed (1,152sf)	chicken coop	utility shed 120sf)	
		barn (1,088sf)			
		barn (864sf)			
contribution value		$40,800.00	$20,000.00	$4,700.00	$4,500.00
			$20,800.00	$36,100.00	$36,300.00
Total Adjustments			$41,300	$85,700	$55,500
Indicated value if Not in Wind Farm			**$215,300**	**$186,615**	**$215,500**
Concluded Value of Subject if Not in Wind Farm Zone		**$205,800**			
Sale Price of Subject		$155,000			
Difference in dollars		($50,800)			
Difference as precentage		**-32.8%**			

Sale #	Arroith-IR-002-T					
Description	**area**		**$/area**		**$ sub-total**	
GLA	1,728	sf	$ 100.27	/sf	$ 173,259.23	
basement	1056	sf	$ 23.79	/sf	$ 25,127.36	
garage	888	sf	$ 25.98	/sf	$ 23,071.48	
covered porch	144	sf	$ 37.71	/sf	$ 5,430.14	
enclosed porch	270	sf	$ 48.12	/sf	$ 12,991.29	
enclosed porch	240	sf	$ 48.12	/sf	$ 11,547.81	
Total Cost New					$ 251,427.31	
Less Depreciation:						
Physical Depreciation				55%	$ 137,142.17	
Effective Age:	*30*	*years*				
Total Economic Life:	*55*	*years*				
Depreciated value of structures:					$ 114,285.14	
Functional Obsolescence				0%	$ -	
Reason: none						
Economic Obsolescence				24%	$ 59,185.14	
Reason: within windfarm						
Contribution (depreciated) value of building:						$ 55,100.00
Contribution (depreciated) value of outbuildings						$ 34,800.00
Plus, contribution value of site improvements						$ 6,000.00
Land value						$ 59,100.00
TOTAL (rounded)						**$ 155,000.00**

Sale #	Blueund-IR-002		
Description	**area**	**$/area**	**$ sub-total**
GLA	1,658 sf	$ 98.56 /sf	$ 163,410.18
basement	1,074 sf	$ 27.84 /sf	$ 29,900.76
garage	704 sf	$ 28.12 /sf	$ 19,797.31
enclosed porch	240 sf	$ 57.60 /sf	$ 13,823.70
	sf	$ - /sf	$ -
	sf	$ - /sf	$ -
Total Cost New			$ 226,931.94

Less Depreciation:			
Physical Depreciation		52%	$ 119,031.94
Effective Age:	*29*	*years*	
Total Economic Life:	*55*	*years*	
Depreciated value of structures:			$ 107,900.00
Functional Obsolescence		0%	$ -
Reason: none			
Economic Obsolescence		0%	$ -
Reason: none			

Contribution (depreciated) value of building:	$ 107,900.00
Contribution (depreciated) value of outbuildings	$ 14,000.00
Plus, contribution value of site improvements	$ 6,000.00
Land value	$ 46,100.00
TOTAL (rounded)	**$ 174,000.00**

Sale #	Cropsey-IR-001			
Description	**area**	**$/area**	**$ sub-total**	
GLA	1,408 sf	$ 102.98 /sf	$ 144,993.71	
basement	1,024 sf	$ 23.79 /sf	$ 24,365.92	
garage	- sf	$ - /sf	$ -	
wood deck	128 sf	$ 23.42 /sf	$ 2,997.85	
	sf	$ - /sf	$ -	
	sf	/sf	$ -	
Total Cost New			$ 172,357.48	
Less Depreciation:				
Physical Depreciation		73%	$ 125,442.48	
Effective Age:	*40*	*years*		
Total Economic Life:	*55*	*years*		
Depreciated value of structures:			$ 46,915.00	
Functional Obsolescence		0%	$ -	
Reason: none				
Economic Obsolescence		0%	$ -	
Reason: none				
Contribution (depreciated) value of building:				$ 46,915.00
Contribution (depreciated) value of outbuildings				$ 1,100.00
Plus, contribution value of site improvements				$ 3,000.00
Land value				$ 49,900.00
TOTAL (rounded)				**$ 100,915.00**

Sale #	Moneeek-IR-001		
Description	**area**	**$/area**	**$ sub-total**
GLA	1,815 sf	$ 95.44 /sf	$ 173,217.49
basement	1,112 sf	$ 22.39 /sf	$ 24,899.58
garage	360 sf	$ 38.88 /sf	$ 13,996.28
porch	84 sf	$ 19.06 /sf	$ 1,600.98
porch	54 sf	$ 20.75 /sf	$ 1,120.75
	sf	/sf	$ -
Total Cost New			$ 214,835.09

Less Depreciation:			
Physical Depreciation		48%	$ 102,835.09
Effective Age:	*26*	*years*	
Total Economic Life:	*55*	*years*	
Depreciated value of structures:			$ 112,000.00
Functional Obsolescence		0%	$ -
Reason: none			
Economic Obsolescence		0%	$ -
Reason: none			

Contribution (depreciated) value of building:	$ 112,000.00
Contribution (depreciated) value of outbuildings	$ -
Plus, contribution value of site improvements	$ 4,500.00
Land value	$ 43,500.00
TOTAL (rounded)	**$ 160,000.00**

Sale Date	Sale Price
October 10, 2017	$155,000
Gross Living Area (sf)	**GLA Price per sf**
1,728	$89.70
Lot Size (acre)	**Lot Price per acre**
2.570	$60,311

/

SALE: Arroith-IR-002-T

Located at:	13691 N 3550 East Road
Municipality:	Arrowsmith Township
County:	McLean, IL
Parcel No.:	24-01-200-002
Grantor:	Barbara N. Kline
Grantee:	John C. Schmidtt
Recording Doc:	2017-00019062
Document type:	Warranty Deed
Zoning:	A – Agriculture
Use:	Agricultural

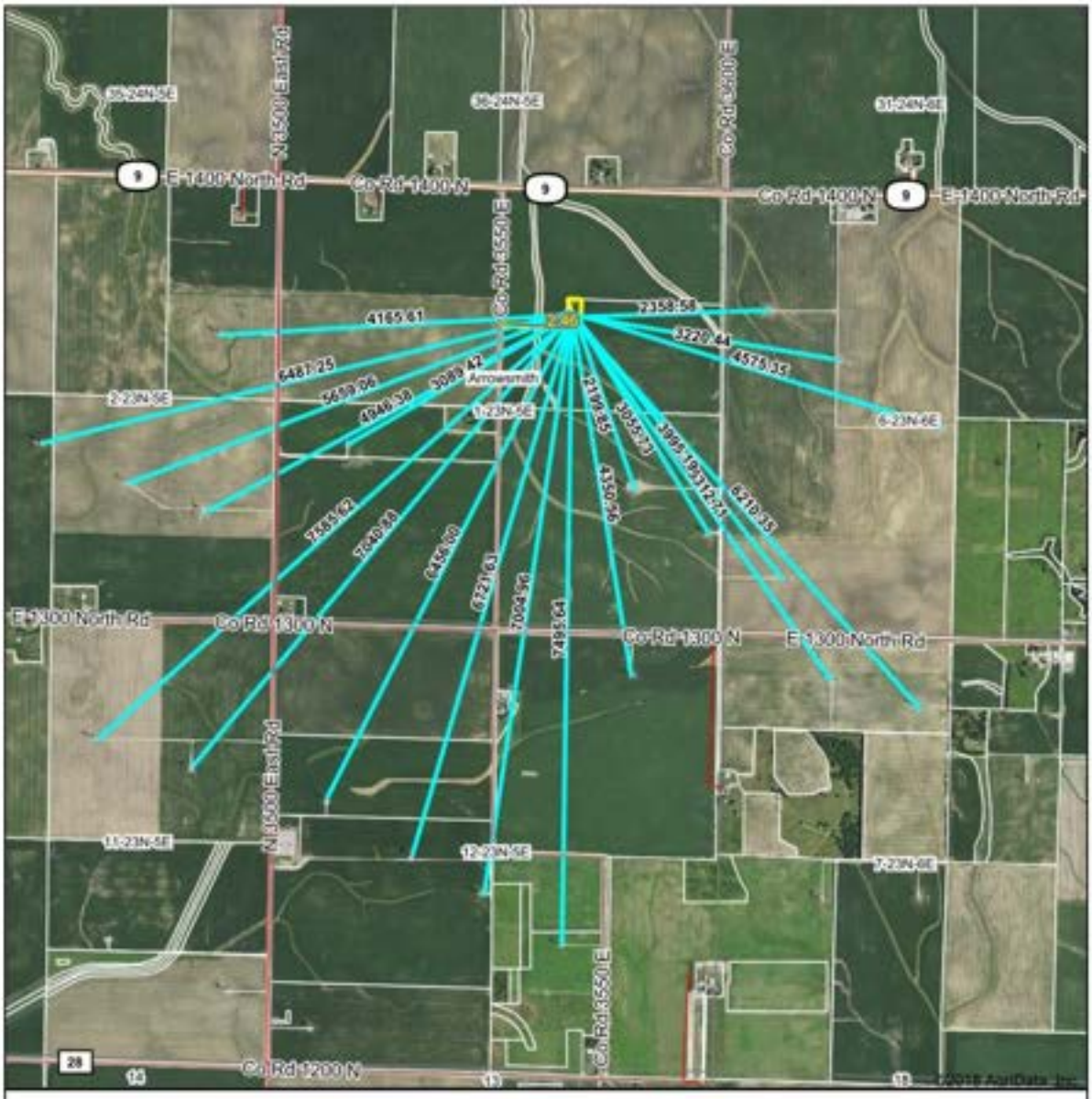
Land	Topography:	open: 36%	wooded: 64%	wetlands: 0%	FEMA/FIRM Floodplain: 0%	
	Terrain:	Gently Rolling	Type of land use present in area:	Rural Residential, Agricultural	Water Feature:	Creek/stream
	Landscaping:	Average	Landscaping Observations:	Lawn, mature trees, shade trees; ornamental bushes		
Improvements	Style/story:	2 story	Exterior siding:	Metal	Year Built:	1880
	Construction Quality:	Average	Basement Type:	Full	FBLA (sf):	0
	# Garage Spaces:	3	Garage Type:	888sf attached	Driveway type:	Gravel
	Room Count:	N/A 3 2	Fireplace:	Wood burning stove	Porches/ Patios/Decks	128sf open porch, 144sf covered porch, 270sf enclosed porch, 240sf enclosed porch
	Central Air:	No	Heating: Forced air	Road Frontage: County road		
	# of Outbuildings:	4	Outbuilding Descriptions:	3 car detached garage (840sf), 1,152sf shed, 1,088sf barn, 864sf barn	Overall Condition:	Average

Additional Observations:	**Land:** The property has a level to gently rolling contour. The property lies in Flood Zone X, an area of minimal flood hazard, within FIRM Panel #17113C0600E, effective 07-16-2008. **Improvements:** Private well/septic system, window air conditioning units, hardwood floors. **Verification Comments:** Owner not present at the time of inspection, questionnaires returned unanswered. The closest wind turbine that is in the view from this property is approximately 2,199.85ft± to the southeast.
Site Inspected by:	James Marske — Date of Inspection: May 17, 2018

Figure 17: View of property with Wind Turbines figuring prominently in the picture looking easterly from N 3550 East Road.

Figure 18: View of residence (Picture used from Trulia due to landowner not being present).

Proximity to closest Wind Turbines - 2,199.85 linear feet



Field borders provided by Farm Service Agency as of 5/21/2008. Soils data provided by University of Illinois at Champaign-Urbana.

SALE: Blueund-IR-002

Sale Date	Sale Price
July 20, 2016	$174,000
Gross Living Area (sf)	**GLA Price per sf**
1,658	$104.95
Lot Size (acre)	**Lot Price per acre**
1.440	$120,833

Located at:	17669 N 2400 East Road
Municipality:	Blue Mound Township
County:	McLean, IL
Parcel No.:	16-18-100-011
Grantor:	Kim C. & Beth A. Schwab
Grantee:	Corey Owens & Ryan Windle
Recording Doc:	2016-00013908
Document type:	Warranty Deed
Zoning:	A – Agriculture
Use:	Rural Residential

Land	Topography:	open: 90%	wooded: 10%	wetlands: 0%	FEMA/FIRM Floodplain: 0%	
	Terrain:	Gently Rolling	Type of land use present in area:	Rural Residential, Agricultural	Water Feature:	None
	Landscaping:	Average	Landscaping Observations:	Lawn, mature trees, shade trees; ornamental bushes, garden area		
Improvements	Style/story:	2 story	Exterior siding:	Vinyl	Year Built:	1899
	Construction Quality:	Average	Basement Type:	Full	FBLA (sf):	256sf±
	# Garage spaces:	2.5	Garage Type:	704sf detached	Driveway type:	Gravel
	Room Count:	N/A 4 1	Fireplace:	No	Porches/ Patios/Decks	240sf enclosed porch
	Central Air:	Yes Heating:	LP gas FHA Road Type	County road		
	# of Outbuildings:	2 Outbuilding Descriptions:	2,240sf pole frame building, chicken coop		Overall Condition:	Average

Additional Observations:	**Land:** The property lies at 790ft to 805ft above sea level. The property lies in Flood Zone X, an area of minimal flood hazard, within FIRM Panel #17113C0350E, effective 07-16-2008. There is an ingress-egress easement and a well/septic maintenance easement upon the lane that connects the property to N 2400 East Road over the adjacent property to the west. **Improvements:** Septic system/private well, newer roof and newer electrical throughout residence and metal shed. **Verification Comments:** Owner not present at the time of inspection, questionnaires returned unanswered.
Site Inspected by:	James Marske — Date of Inspection: May 17, 2018

Sale Date	Sale Price
August 19, 2016	$100,915
Gross Living Area (sf)	**GLA Price per sf**
1,408	$71.67
Lot Size (acre)	**Lot Price per acre**
1.560	$64,689

SALE: Cropsey-IR-001

Located at:	22747 N 4100 East Road
Municipality:	Cropsey Township
County:	McLean, IL
Parcel No.:	11-24-101-011
Grantor:	Benjamin T. & Stephanie Gunther
Grantee:	Tyler W. & Cassandra L. McMurray
Recording Doc:	2016-00016072
Document type:	Warranty Deed
Zoning:	A – Agriculture
Use:	Rural Residential

Land	Topography:	open: 60%	wooded: 40%	wetlands: 0%	FEMA/FIRM Floodplain: 0%	
	Terrain:	Level to Gently Rolling	Type of land use present in area:	Rural Residential, Agricultural	Water Feature:	None
	Landscaping:	Fair	Landscaping Observations:	Lawn, scattered semi-mature and mature trees		
Improvements	Style/story:	1.5 story	Exterior siding:	Vinyl	Year Built:	1901
	Construction Quality:	Average	Basement Type:	Full	FBLA (sf):	0
	# Garage spaces:	-	Garage Type:	-	Driveway type:	Gravel
	Room Count:	N/A 3 2	Fireplace:	No	Porches/ Patios/Decks	128sf deck
	Central Air:	Yes	Heating:	LP gas FHA	Road Frontage	County Road
	# of Outbuildings:	2	Outbuilding Descriptions:	Utility shed (80sf±), Utility shed (120sf±)	Overall Condition:	Average

Additional Observations:	**Land:** The property lies at 745ft to 755ft above sea level. The property lies in Flood Zone X, an area of minimal flood hazard, within FIRM Panel #17113C0425E, effective 07-16-2008. **Improvements:** Private well/septic system. Updates include roof, insulation, siding, gutters, plumbing, electrical, drywall, and flooring. **Verification Comments:** The buyer, Cassandra McMurray, stated by questionnaire that she did not know the seller, the sale price was fair, and that the sale price was negotiated from the asking price.

Site Inspected by:	James Marske	Date of Inspection:	May 17, 2018

Sale Date	Sale Price
February 8, 2017	$160,000
Gross Living Area (sf)	**GLA Price per sf**
1,815	$88.15
Lot Size (acre)	**Lot Price per acre**
1.360	$117,647

SALE: Moneeek-IR-001

Located at:	20393 N 2150 East Road
Municipality:	Money Creek Township
County:	McLean, IL
Parcel No.:	08-34-400-019
Grantor:	Sara E. Standish
Grantee:	Joanna M. Kitchens
Recording Doc:	2017-00002830
Document type:	Warranty Deed
Zoning:	A – Agriculture
Use:	Rural Residential

Land	Topography:	open: 74%	wooded: 26%	wetlands: 0%	FEMA/FIRM Floodplain: 0%	
	Terrain:	Level	Type of land use present in area:	Rural Residential, Agricultural	Water Feature:	None
	Landscaping:	Average	Landscaping Observations:	Lawn, mature trees, shade trees; ornamental bushes		
Improvements	Style/story:	1.5 story	Exterior siding:	Vinyl	Year Built:	1920
	Construction Quality:	Average	Basement Type:	Full w/crawl space	FBLA (sf):	None
	# Garage spaces:	2	Garage Type:	360sf detached	Driveway type:	Gravel
	Room Count:	N/A 3 1.5	Fireplace:	None	Porches/ Patios/Decks	84sf open porch, 54sf open porch
	Central Air:	No	Heating:	Forced air	Road Frontage	County Road
	# of Outbuildings:	-	Outbuilding Descriptions:	-	Overall Condition:	Average

Additional Observations:	**Land:** The property lies at 790ft to 792ft above sea level. The property lies in Flood Zone X, an area of minimal flood hazard, within FIRM Panel #17113C0350E, effective 07-16-2008. **Improvements:** Well and septic system on the property, above ground pool, unfinished attic in the house (703sf). **Verification Comments:** The buyer Joanna Kitchens, stated by questionnaire that she did not know the previous owner, the sale price was fair, and that the sale price was negotiated down from the asking price.
Site Inspected by:	James Marske — Date of Inspection: May 17, 2018

Paired Sales Group J

Paired Sales Analysis- Group J				
		Arroith-IR-003-T	Oldtown-IR-002	Moneeek-IR-001
address		10197 N 3500 East Rpad	22792 E 1000 North Road	20393 N 2150 East Road
Municipality/County		Arrowsmith Township	Old Town Township	Money Creek Township
Sale Price		$261,900.00	$207,000.00	$160,000.00
Sale Date		June 4, 2016	December 16, 2016	February 8, 2017
time in months		Base	-7	-8
time adj per year		0.0%	0.00%	0.00%
Adj Sales Price			$207,000.00	$160,000.00
lot size description	acres	9.6	3.21	1.36
	land=	$124,800.00	$64,200.00	$43,500.00
adjustment			$60,600.00	$81,300.00
neighborhood location		Wind Farm- Zone 0	Non-wind farm	Non-wind farm
adjustment			$0.00	$0.00
style		2 sty	1.5 sty	1.5 sty
age		1911	1901	1920
effective age		26	30	26
percent adj of residence			7%	0%
adjustment			$9,100.00	$0.00
exterior siding		metal w/brick trim	brick	vinyl
quality of construction		average	average	average
room count	total	unknown	unknown	unknown
	BRs	3	3	3
	baths	2.5	3	1.5
GLA	in sq.ft.	2,016	1,990	1,815
contribution value $/sf			$50.09	$49.75
adjustment	$/sf base		$1,300.00	$10,000.00
basement		1176	1654	1112
portion finished in sf		0	0	0
contribution value $/sf			$0.00	$0.00
adjustment			$0.00	$0.00
garage		624	320	360
contribution value		$12,000.00	$6,000.00	$7,000.00
adjustment			$6,000.00	$5,000.00
porches, decks		enclosed por, deck, patio	(2) covered porches, patio	cov porch, porch
contribution value		$7,000.00	$4,000.00	$1,000.00
adjustment			$3,000.00	$6,000.00
Other		gravel	gravel drive & concrete	gravel drive
		landscaping	landscaping (min)	landscaping (min)
		riding arena + stalls + shop (6,264sf)	loafing shed (192sf)	
			Pole barn/garage (1,800sf)	
contribution value		$43,100.00	$17,100.00	$4,500.00
			$26,000.00	$38,600.00
Total Adjustments			$106,000	$140,900
Indicated value if Not in Wind Farm			**$313,000**	**$300,900**
Concluded Value of Subject if Not in Wind Farm Zone		**$307,000**		
Sale Price of Subject		$261,900		
Difference in dollars		($45,100)		
Difference as precentage		**-17.2%**		

Sale #	Arroith-IR-003-T				
Description	**area**		**$/area**		**$ sub-total**
GLA	2,016	sf	$ 102.42	/sf	$ 206,473.15
basement	1176	sf	$ 22.39	/sf	$ 26,332.65
garage (heated)	624	sf	$ 37.88	/sf	$ 23,640.04
enclosed porch	196	sf	$ 53.51	/sf	$ 10,487.23
wood deck	144	sf	$ 22.16	/sf	$ 3,190.73
patio	248	sf	$ 7.42	/sf	$ 1,841.38
		sf	$ -	/sf	$ -
Total Cost New					$ 271,965.17
Less Depreciation:					
Physical Depreciation				47%	$ 128,565.35
Effective Age:	*26*	*years*			
Total Economic Life:	*55*	*years*			
Depreciated value of structures:					$ 143,399.82
Functional Obsolescence				0%	$ -
Reason: none					
Economic Obsolescence				34%	$ 49,399.82
Reason: within windfarm					

Contribution (depreciated) value of building:	$ 94,000.00
Contribution (depreciated) value of outbuildings	$ 36,100.00
Plus, contribution value of site improvements	$ 7,000.00
Land value	$ 124,800.00
TOTAL (rounded)	**$ 261,900.00**

Sale #	Oldtown-IR-002		
Description	**area**	**$/area**	**$ sub-total**
GLA	1,990 sf	$ 109.36 /sf	$ 217,631.89
basement	1,654 sf	$ 20.99 /sf	$ 34,715.10
garage	320 sf	$ 38.88 /sf	$ 12,441.14
covered porch	120 sf	$ 40.87 /sf	$ 4,903.96
covered porch	60 sf	$ 52.85 /sf	$ 3,171.09
patio	204 sf	$ 7.68 /sf	$ 1,567.16
Total Cost New			$ 274,430.34
Less Depreciation:			
Physical Depreciation		54%	$ 148,730.34
Effective Age:	*30*	*years*	
Total Economic Life:	*55*	*years*	
Depreciated value of structures:			$ 125,700.00
Functional Obsolescence		0%	$ -
Reason: none			
Economic Obsolescence		0%	$ -
Reason: none			
Contribution (depreciated) value of building:			$ 125,700.00
Contribution (depreciated) value of outbuildings			$ 12,100.00
Plus, contribution value of site improvements			$ 5,000.00
Land value			$ 64,200.00
TOTAL (rounded)			**$ 207,000.00**

Sale #	Moneeek-IR-001				
Description	**area**		**$/area**	**$ sub-total**	
GLA	1,815	sf	$ 95.44 /sf	$ 173,217.49	
basement	1,112	sf	$ 22.39 /sf	$ 24,899.58	
garage	360	sf	$ 38.88 /sf	$ 13,996.28	
covered porch	84	sf	$ 19.06 /sf	$ 1,600.98	
porch	54	sf	$ 20.75 /sf	$ 1,120.75	
		sf	/sf	$ -	
Total Cost New				$ 214,835.09	
Less Depreciation:					
Physical Depreciation			48%	$ 102,835.09	
Effective Age:	*26*	*years*			
Total Economic Life:	*55*	*years*			
Depreciated value of structures:				$ 112,000.00	
Functional Obsolescence			0%	$ -	
Reason: none					
Economic Obsolescence			0%	$ -	
Reason: none					
Contribution (depreciated) value of building:					$ 112,000.00
Contribution (depreciated) value of outbuildings					$ -
Plus, contribution value of site improvements					$ 4,500.00
Land value					$ 43,500.00
TOTAL (rounded)					**$ 160,000.00**

Sale Date	Sale Price
June 4, 2016	$261,900
Gross Living Area (sf)	**GLA Price per sf**
2,016	$129.91
Lot Size (acre)	**Lot Price per acre**
9.600	$27,281

SALE: Arroith-IR-003-T

Located at:	10197 N 3500 East Road
Municipality:	Arrowsmith Township
County:	McLean, IL
Parcel No.:	24-24-300-003
Grantor:	Brandon A. & Amanda R. Clark
Grantee:	Geoff & Andrea Skinner
Recording Doc:	2016-00011578
Document type:	Warranty Deed
Zoning:	A – Agriculture
Use:	Agricultural

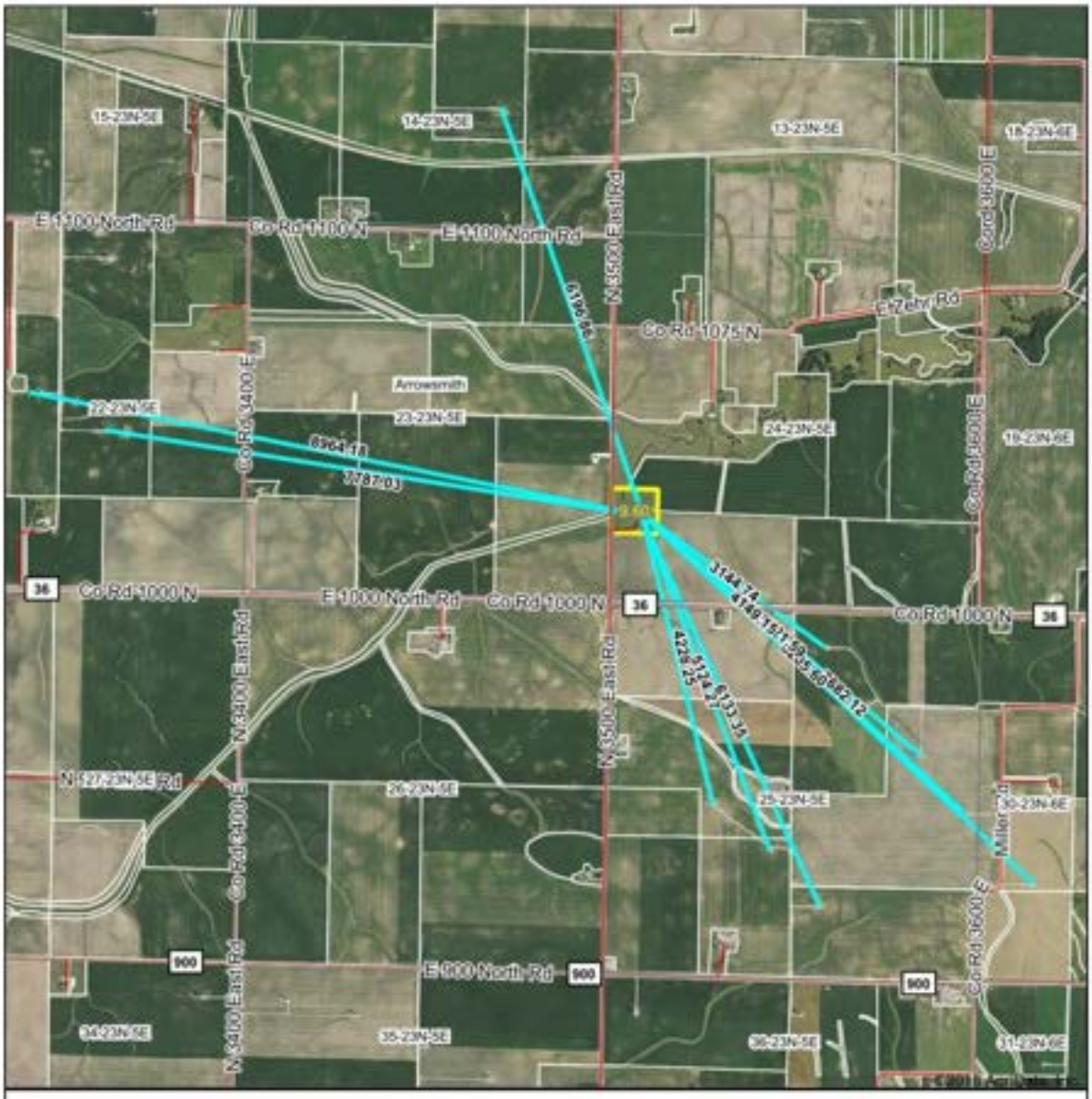
Land	Topography:	open: 94%	wooded: 6%	wetlands: 0%	FEMA/FIRM Floodplain: 50%	
	Terrain:	Gently Rolling	Type of land use present in area:	Rural Residential, Agricultural	Water Feature:	Sangamon River
	Landscaping:	Average	Landscaping Observations:	Lawn, mature trees, shade trees; ornamental bushes, orchard trees		
Improvements	Style/story:	2 story	Exterior siding:	Brick/metal	Year Built:	1911
	Construction Quality:	Average	Basement Type:	Full	FBLA (sf):	0
	# Garage Spaces:	2	Garage Type:	624sf attached	Driveway type:	Gravel
	Room Count:	N/A 3 2.5	Fireplace:	Natural fireplace	Porches/ Patios/Decks	196sf enclosed porch, 144sf deck, 248sf patio
	Central Air:	Yes Heating:	LP gas FHA Road Type	County road		
	# of Outbuildings:	1 Outbuilding Descriptions:	6,264sf 4-sided metal shed with 4 stalls and riding area with concrete floor and insulation in the workshop area		Overall Condition:	Average

Additional Observations:	**Land:** The property has a gently rolling contour. A large part of the property surrounding the Sangamon River lies in Flood Zone A, a floodplain, within FIRM Panel #17113C0600E, effective 07-16-2008. The remainder of the property lies in Flood Zone X, an area of minimal flood hazard. **Improvements:** Well/septic system, new roof, and new high-efficiency furnace, updated cabinetry throughout. **Verification Comments:** Owner not present at the time of inspection, questionnaires returned unanswered. The closest wind turbine that is in the view from this property is approximately 3,144.74ft± to the southeast.
Site Inspected by:	James Marske — Date of Inspection: May 17, 2018

Figure 19: View of Wind Turbines looking southerly from a driveway in front of the residence.

Figure 20: View of Wind Turbines looking southeasterly from a driveway in front of the residence.

Proximity to closest Wind Turbines - 3,144.74 linear feet



SALE: Moneeek-IR-001

Sale Date	Sale Price
February 8, 2017	$160,000
Gross Living Area (sf)	**GLA Price per sf**
1,815	$88.15
Lot Size (acre)	**Lot Price per acre**
1.360	$117,647

Located at:	20393 N 2150 East Road
Municipality:	Money Creek Township
County:	McLean, IL
Parcel No.:	08-34-400-019
Grantor:	Sara E. Standish
Grantee:	Joanna M. Kitchens
Recording Doc:	2017-00002830
Document type:	Warranty Deed
Zoning:	A – Agriculture
Use:	Rural Residential

Land	Topography:	open: 74%	wooded: 26%	wetlands: 0%	FEMA/FIRM Floodplain: 0%	
	Terrain:	Level	Type of land use present in area:	Rural Residential, Agricultural	Water Feature:	None
	Landscaping:	Average	Landscaping Observations:	Lawn, mature trees, shade trees; ornamental bushes		
Improvements	Style/story:	1.5 story	Exterior siding:	Vinyl	Year Built:	1920
	Construction Quality:	Average	Basement Type:	Full w/crawl space	FBLA (sf):	None
	# Garage spaces:	2	Garage Type:	360sf detached	Driveway type:	Gravel
	Room Count:	N/A 3 1.5	Fireplace:	None	Porches/ Patios/Decks	84sf open porch, 54sf open porch
	Central Air:	No	Heating:	Forced air	Road Frontage	County Road
	# of Outbuildings:	-	Outbuilding Descriptions:	-	Overall Condition:	Average

Additional Observations:	**Land:** The property lies at 790ft to 792ft above sea level. The property lies in Flood Zone X, an area of minimal flood hazard, within FIRM Panel #17113C0350E, effective 07-16-2008. **Improvements:** Well and septic system on the property, above ground pool, unfinished attic in the house (703sf). **Verification Comments:** The buyer Joanna Kitchens, stated by questionnaire that she did not know the previous owner, the sale price was fair, and that the sale price was negotiated down from the asking price.
Site Inspected by:	James Marske — Date of Inspection: May 17, 2018

Sale Date	Sale Price
December 16, 2016	$207,000
Gross Living Area (sf)	**GLA Price per sf**
1,990	$104.02
Lot Size (acre)	**Lot Price per acre**
3.210	$64,486

SALE: Oldtown-IR-002

Located at:	22792 E 1000 North Road
Municipality:	Old Town Township
County:	McLean, IL
Parcel No.:	22-23-400-006
Grantor:	Ronald & Rebecca Wheeler
Grantee:	Joseph J. & Karla S. T. Jenkins
Recording Doc:	2016-00024490
Document type:	Warranty Deed
Zoning:	A – Agriculture
Use:	Residential

Land	Topography:	open: 82%	wooded: 18%	wetlands: 0%	FEMA/FIRM Floodplain: 0%	
	Terrain:	Level	Type of land use present in area:	Rural Residential, Agricultural	Water Feature:	Drainage ditch
	Landscaping:	Average	Landscaping Observations:	Lawn, mature trees, shade trees; ornamental bushes		
Improvements	Style/story:	1.5 story	Exterior siding:	Vinyl	Year Built:	1884
	Construction Quality:	Average	Basement Type:	Full	FBLA (sf):	0
	# Garage Spaces:	1	Garage Type:	320sf detached	Driveway type:	Gravel and concrete
	Room Count:	N/A 3 3	Fireplace:	Wood burning stove	Porches/ Patios/Decks	120sf covered porch, 60sf covered porch, 204sf concrete patio
	Central Air:	Yes	Heating:	LP FHA	Road Frontage	County Road
	# of Outbuildings:	2	Outbuilding Descriptions:	192sf shed, 1,800sf pole barn/garage	Overall Condition:	Average

Additional Observations:	**Land:** The property lies at 865ft to 875ft above sea level. The property lies in Flood Zone X, an area of minimal flood hazard, within FIRM Panel #17113C0550E, effective 07-16-2008. **Improvements:** Well/septic system, new roof, new hardwood floors**,** new foundation. **Verification Comments:** The buyer Joseph Jenkins, stated by questionnaire that he did know the seller as a family acquaintance, the sale price was fair and that the sale price was negotiated down from the asking price.
Site Inspected by:	James Marske — Date of Inspection: May 17, 2018

Paired Sales Group K

Paired Sales Analysis- Group K			
		Dawson-IR-002-T	Oldtown-IR-002
address		13321 N 2900 East Road	22792 E 1000 North Road
Municipality/County		Dawson Township	Old Town Township
Sale Price		$275,000.00	$207,000.00
Sale Date		May 15, 2017	December 16, 2016
time in months		Base	5
time adj per year		0.0%	0.00%
Adj Sales Price			$207,000.00
lot size description	acres	5.16	3.21
	land=	$82,600.00	$64,200.00
adjustment			$18,400.00
neighborhood location		Wind Farm- Zone 0	Non-wind farm
adjustment			$0.00
style		2 sty	1.5 sty
age		1920	1901
effective age		20	30
percent adj of residence			18%
adjustment			$22,900.00
exterior siding		brick	brick
quality of construction		average	average
room count	total	unknown	unknown
	BRs	4	3
	baths	2	3
GLA	in sq.ft.	2,054	1,990
contribution value $/sf			$50.09
adjustment	$/sf base		$3,200.00
basement		1294	1654
portion finished in sf		0	0
contribution value $/sf			$0.00
adjustment			$0.00
garage		480	320
contribution value		$11,000.00	$6,000.00
adjustment			$5,000.00
porches, decks		deck, porch	(2) covered porches, patio
contribution value		$4,000.00	$4,000.00
adjustment			$0.00
Other		gravel	gravel drive & concrete
		landscaping	landscaping (min)
		shed (800sf)	loafing shed (192sf)
		barn with lean-to (2,720sf)	Pole barn/garage (1,800sf)
		pole barn (1,560sf)	
contribution value		$60,900.00	$17,100.00
			$43,800.00
Total Adjustments			$93,300
Indicated value if Not in Wind Farm			**$300,300**
Concluded Value of Subject if Not in Wind Farm Zone		**$300,300**	
Sale Price of Subject		$275,000	
Difference in dollars		($25,300)	
Difference as precentage		**-9.2%**	

Sale #	Dawson-IR-002-T		
Description	**area**	**$/area**	**$ sub-total**
GLA	2,054 sf	$ 110.60 /sf	$ 227,176.91
basement	1,294 sf	$ 21.69 /sf	$ 28,067.05
garage	480 sf	$ 36.54 /sf	$ 17,539.20
wood deck	144 sf	$ 22.16 /sf	$ 3,190.73
porch	180 sf	$ 19.64 /sf	$ 3,535.90
	sf	$ - /sf	$ -
Total Cost New			$ 279,509.79
Less Depreciation:			
Dawson-IR-002-T		36%	$ 101,639.92
Effective Age:	*20*	*years*	
Total Economic Life:	*55*	*years*	
Depreciated value of structures:			$ 177,869.87
Functional Obsolescence		0%	$ -
Reason: none			
Economic Obsolescence		26%	$ 46,369.87
Reason: none			

Contribution (depreciated) value of building:	$ 131,500.00
Contribution (depreciated) value of outbuildings	$ 53,900.00
Plus, contribution value of site improvements	$ 7,000.00
Land value	$ 82,600.00
TOTAL (rounded)	**$ 275,000.00**

Sale #	Oldtown-IR-002		
Description	**area**	**$/area**	**$ sub-total**
GLA	1,990 sf	$ 109.36 /sf	$ 217,631.89
basement	1,654 sf	$ 20.99 /sf	$ 34,715.10
garage	320 sf	$ 38.88 /sf	$ 12,441.14
covered porch	120 sf	$ 40.87 /sf	$ 4,903.96
covered porch	60 sf	$ 52.85 /sf	$ 3,171.09
patio	204 sf	$ 7.68 /sf	$ 1,567.16
Total Cost New			$ 274,430.34
Less Depreciation:			
Physical Depreciation		54%	$ 148,730.34
Effective Age:	*30*	*years*	
Total Economic Life:	*55*	*years*	
Depreciated value of structures:			$ 125,700.00
Functional Obsolescence		0%	$ -
Reason: none			
Economic Obsolescence		0%	$ -
Reason: none			
Contribution (depreciated) value of building:			$ 125,700.00
Contribution (depreciated) value of outbuildings			$ 12,100.00
Plus, contribution value of site improvements			$ 5,000.00
Land value			$ 64,200.00
TOTAL (rounded)			**$ 207,000.00**

Sale Date	Sale Price
May 15, 2017	$275,000
Gross Living Area (sf)	**GLA Price per sf**
2,054	$133.89
Lot Size (acre)	**Lot Price per acre**
5.160	$53,295

SALE: Dawson-IR-002-T

Located at:	13321 N 2900 East Road
Municipality:	Dawson Township
County:	McLean, IL
Parcel No.:	23-01-300-006
Grantor:	James M. & Debbie L. Wheeler
Grantee:	Bethany M. Presutti
Recording Doc:	2016-00006469
Document type:	Warranty Deed
Zoning:	A - Agriculture
Use:	Agricultural

Land	Topography:	open: 98%	wooded: 2%	wetlands: 0%	FEMA/FIRM Floodplain: 0%	
	Terrain:	Level	Type of land use present in area:	Agricultural	Water Feature:	None
	Landscaping:	Average	Landscaping Observations:	Lawn, mature trees, shade trees; ornamental bushes, stone landscaping improvements with flower beds		
Improvements	Style/story:	2 story	Exterior siding:	Brick/Wood	Year Built:	1920
	Construction Quality:	Average	Basement Type:	Full w/crawl space	FBLA (sf):	0
	# Garage Spaces:	2.5	Garage Type:	480sf detached	Driveway type:	Gravel
	Room Count:	N/A 4 2	Fireplace:	Wood burning stove	Porches/ Patios/Decks	144sf deck, 180sf open porch
	Central Air:	Yes	Heating:	LP gas FHA	Road Frontage	County road
	# of Outbuildings:	3	Outbuilding Descriptions:	800sf shed, 2,720'sf barn & lean-to (barn-864sf/lean-to-864'sf), 1,560sf shed	Overall Condition:	Average

Additional Observations:	**Land:** The property has a level contour. The property lies in Flood Zone X, an area of minimal flood hazard, within FIRM Panel #17113C0575E, effective 07-16-2008. **Improvements:** Private well/septic system, fenced pastures with a double cross hotwired fence, newer roof, central air, furnace, wood burning stove, and windows, above ground pool. **Verification Comments:** Owner not present at the time of inspection, questionnaires returned unanswered. The closest wind turbine that is in the view from this property is approximately 1,666.58± to the northwest.
Site Inspected by:	James Marske — Date of Inspection: May 17, 2018

Figure 21: View of Wind Turbines across N 2900 East Road looking westerly from driveway entrance.

Figure 22: View of Wind Turbines looking easterly from the detached garage entrance at the eastern end of the property.

Proximity to closest Wind Turbines - 1,666.58 linear feet

map center: 40° 28' 33.39, -88° 42' 19.45

0ft 840ft 1680ft

1-23N-4E
McLean County
Illinois

N W E S

7/11/2018

Maps Provided By surety © Agridata, Inc. 2018 www.AgriDataInc.com

Field borders provided by Farm Service Agency as of 5/21/2008. Soils data provided by University of Illinois at Champaign-Urbana.

SALE: Oldtown-IR-002

Sale Date	Sale Price
December 16, 2016	$207,000
Gross Living Area (sf)	**GLA Price per sf**
1,990	$104.02
Lot Size (acre)	**Lot Price per acre**
3.210	$64,486

Located at:	22792 E 1000 North Road
Municipality:	Old Town Township
County:	McLean, IL
Parcel No.:	22-23-400-006
Grantor:	Ronald & Rebecca Wheeler
Grantee:	Joseph J. & Karla S. T. Jenkins
Recording Doc:	2016-00024490
Document type:	Warranty Deed
Zoning:	A – Agriculture
Use:	Residential

Land	Topography:	open: 82%	wooded: 18%	wetlands: 0%	FEMA/FIRM Floodplain: 0%	
	Terrain:	Level	Type of land use present in area:	Rural Residential, Agricultural	Water Feature:	Drainage ditch
	Landscaping:	Average	Landscaping Observations:	Lawn, mature trees, shade trees; ornamental bushes		
Improvements	Style/story:	1.5 story	Exterior siding:	Vinyl	Year Built:	1884
	Construction Quality:	Average	Basement Type:	Full	FBLA (sf):	0
	# Garage Spaces:	1	Garage Type:	320sf detached	Driveway type:	Gravel and concrete
	Room Count:	N/A 3 3	Fireplace:	Wood burning stove	Porches/ Patios/Decks	120sf covered porch, 60sf covered porch, 204sf concrete patio
	Central Air:	Yes Heating:	LP FHA	Road Frontage: County Road		
	# of Outbuildings:	2 Outbuilding Descriptions:	192sf shed, 1,800sf pole barn/garage		Overall Condition:	Average

Additional Observations:	**Land:** The property lies at 865ft to 875ft above sea level. The property lies in Flood Zone X, an area of minimal flood hazard, within FIRM Panel #17113C0550E, effective 07-16-2008. **Improvements:** Well/septic system, new roof, new hardwood floors, new foundation. **Verification Comments:** The buyer Joseph Jenkins, stated by questionnaire that he did know the seller as a family acquaintance, the sale price was fair, and that the sale price was negotiated down from the asking price.
Site Inspected by:	James Marske — Date of Inspection: May 17, 2018

Twin Groves II Wind Farm – Regression Analysis of Agricultural Vacant Land

Introduction

We completed a regression analysis study to isolate the impact that a wind farm has vacant agricultural property value located within and outside of the Twin Groves II wind farm. Since we had a high level of homogeneity of sales and an adequate number of sales, we were able to utilize the valuation methodology of multiple-regression analysis.

The Farm

The wind farm that was selected was the Twin Groves II wind farm located in McLean County, Illinois. This wind farm was selected due to its size, contemporary wind turbines and an adequate number of sales within the identified wind farm.

The details of the Twin Grove II wind farm are found in the chart below:

Name	Twin Groves II
Location	McLean County, Illinois, Townships of Arrowsmith, Cheney's Grove and Dawson.
Land area	11,000 acres (approximately half of the two wind farms Twin Groves I & II)
Date of operation	2008
Number of wind turbines	120 wind turbines
Type of wind turbines	Vestas V82 1.65 MW Wind Turbines *(picture on next page)*
Size in kW of wind turbines	1.65MW each x 120 turbines = 198MW
Hub height of wind turbines	80m (280ft±)
Diameter of Turbine	82.0m (269ft±)
Turbine height	Hub ht + ½ diameter of rotors = 80m + ½ (82m)= 121m (397ft±)
Maximum MW output	Approximately 198MW

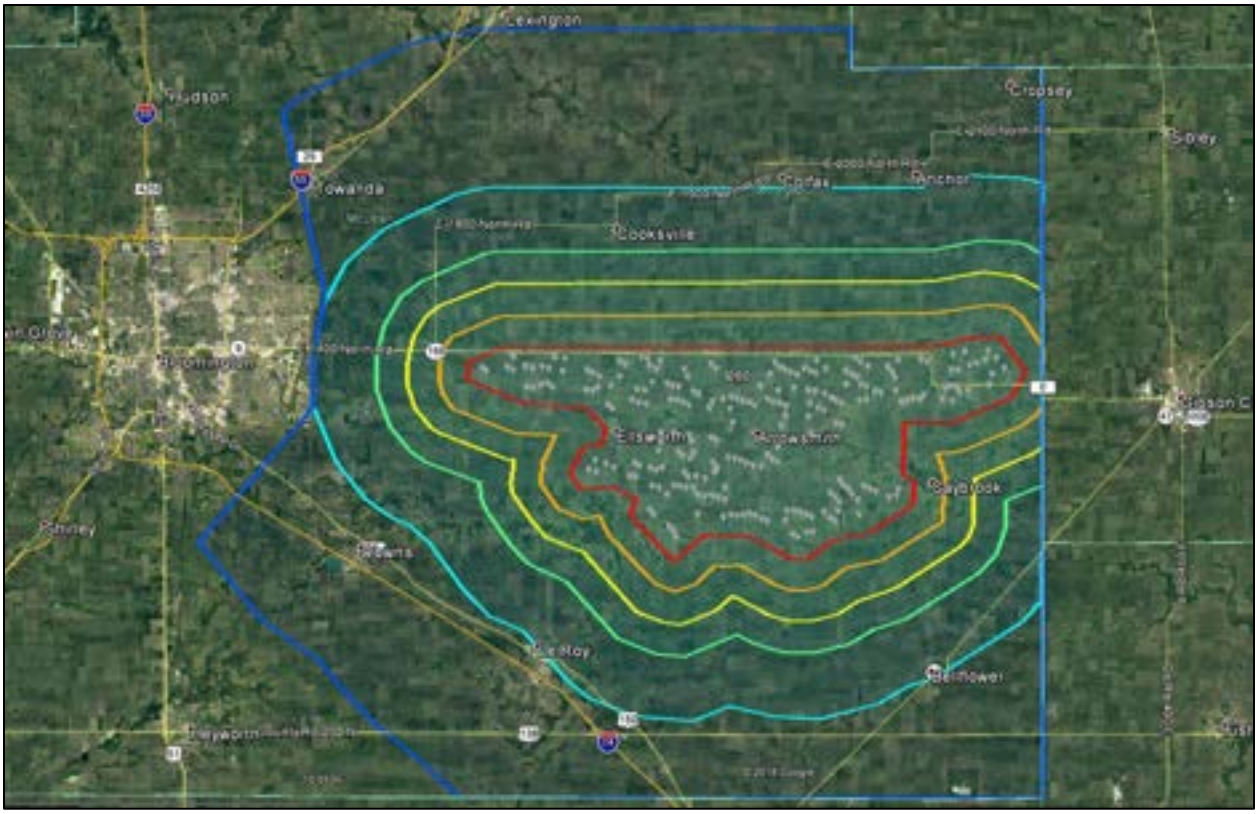


Figure 23: the red line outlines the wind farm Zone-0, orange line is Zone-1, yellow line is Zone-2, green line is Zone 3, light blue line is Zone 4 which has a two-mile width and the dark blue line is Zone 5 which has a five-mile width.

Scope of Work

The scope of work to complete this study included:

- Research, collect data and confirm information regarding the Twin Groves II wind farm.
- Locating the wind farm on Google Pro mapping software, locate all the wind turbines within the wind farm and create the wind farm zone and concentric 1-mile zones radiating out from the farm to locate comparable sales as indicated on the map *(see next page for working map)*.
- Research and collect sales of agricultural land sales within the wind farm, Zone 0.
- Research and collect sales of comparable agricultural land sales in Zones 1-5.
- Collect sales data, property data and assessor's data on all sales.
- Visit each sale on-site, take photographs, make field notes and try to confirm sale with the current property owner.
- Send confirmation requests to those sales not confirm in the field.
- Collect sales and support data from the McLean County Court House.
- Complete sales information data sheets.
- Income stream due to wind turbine lease payments of all sales located within the wind farm.

- The income stream was capitalized and then that amount was extracted from the sales price to leave the vacant land value which was then compared to comparable land sales outside of the wind farm.
- Contract the services of Jim Sanders (appraiser and statistician) with REAL LLC, Tucson, Arizona, to complete the regression analysis and write the summary of the analysis.

The Study

The study utilized a total of 38 agricultural land sales all located within and around the wind farm. Of the total sales, 8 sales were found within the wind farm and 30 were located outside of the wind farm in zones 1-5. The following variables were found and recorded for each sale:

1. Location of sale being either within or outside of the wind farm Zone 0.
2. Sale amount.
3. Date of sale.
4. Acres.
5. Productivity index of the land.
6. Ground cover.

All the sales were selected to have the highest level of comparability to the wind farm land sales. All sales had 100% open ground cover being all open cropland without any wooded areas. The variables of value then became the date of sale and productivity index of the soils.

Study Conclusion

The regression analysis extracted a -8.5% impact on the overall land value due to the presence of the wind farm. Therefore, it is projected that agricultural land located within the wind farm Zone 0 will experience an overall property loss of -8.5% net of the value generated by the wind turbine lease income stream.

Regression Analysis

Regression Analysis: AdjSP versus Productivity, XSDAC, ...

```
The regression equation is
AdjSP = 2949523 + 10135 Productivity + 10783 XSDAC - 101 Date of Sale - 843 ac zone
```

Predictor	Coef	SE Coef	T	P	VIF
Constant	2949523	2806081	1.05	0.301	
Productivity	10135	2206	4.59	0.000	1.085
XSDAC	10782.8	148.0	72.83	0.000	1.630
Date of Sale	-101.36	64.15	-1.58	0.124	1.048
ac zone	-843.0	162.3	-5.19	0.000	1.617

```
S = 65296.1   R-Sq = 99.6%   R-Sq(adj) = 99.5%
```

Analysis of Variance

Source	DF	SS	MS	F	P
Regression	4	3.31308E+13	8.28270E+12	1942.66	0.000
Residual Error	33	1.40698E+11	4263581461		
Total	37	3.32715E+13			

Durbin-Watson statistic = 1.97573

No evidence of lack of fit (P >= 0.1).

This is the XLOF test checking for lack of fit (LOF). This is a test to make sure there are no violations of linearity between the predicted variable of Adjsp and the predicted variables

Explanation of the Predictors

Adjsp: This is the adjusted sales price for those sales located within the wind farm zone that are receiving cash payments. This is the variable that is being predicted in the model. Thus, the sales prices of the farms are being predicted by the variables described below. Note that this model explains 99.5% of the variance in the mean sales price. This is essentially a perfect fit.

Constant: Since the regression analysis is actually multi-linear regression analysis, a straight-line function is estimated. A straight line function takes the form of $y = a + bx_i$, where "y" is the predicted variable, "a" is the constant which represents where the straight line crosses the x-axis in a Cartesian coordinate graph. The "b" represents the coefficients of the explanatory variables.

Productivity: This is a measure of the farm's soil quality stated as crop productivity index (CPI). The coefficient of 10135 means that for every integer increase in the productivity scale results in an increase, on average, of $10,135 to the sales price. The SE Coef means the standard error of the coefficient which is an indication of variance in this estimate. The "P" value for this coefficient is 0.000 which means a rejection of the null hypothesis that this variable does not impact sales price. To put into practical terms, one CPI unit equals 0.36% increase(decrease) in land value.

XSDAC: This is what is called an interaction variable between SD (sales date) and AC (the number of acres. This variable indicates that on average over time the size of the farms purchased increased. Again, the P value indicates a rejection of the null hypothesis.

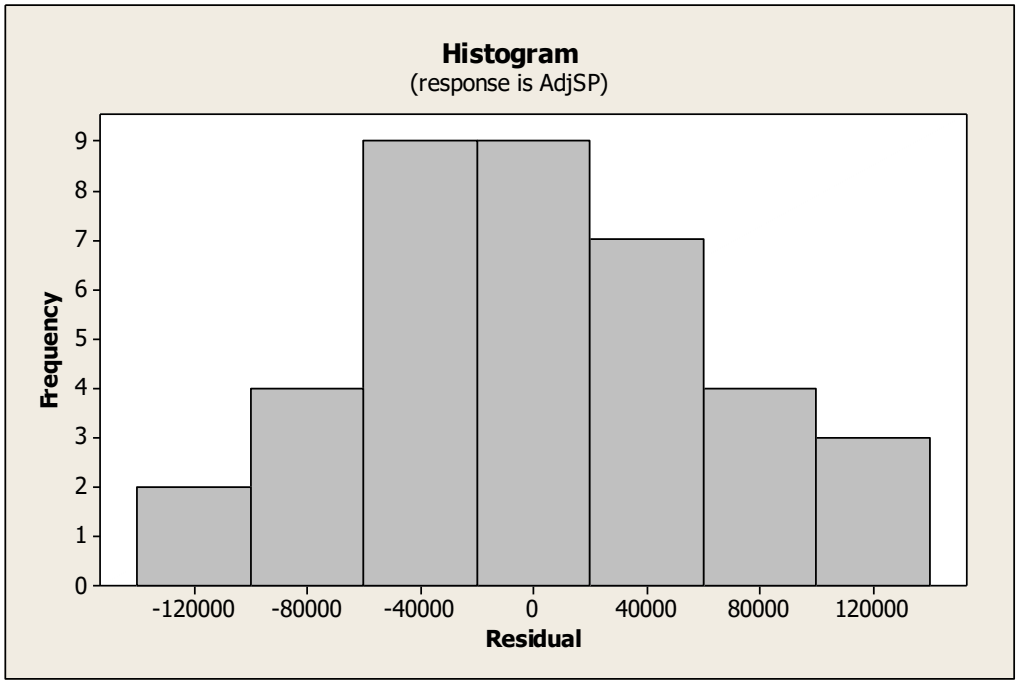
Date of Sale: This is the date of sale for each property. Each date is transformed into a number that is created by starting with the first day in January in year 0, assigning the number 1 and increases monotonically with each new day. The -101.36 the negative sign does not mean prices are going down over time because this a correcting adjustment term needed because sales date is part of the interaction variable above.

ac zone: This is the variable of interest. This is an interaction term of the number of acres interacting with only those sales located within the wind farm zone. Thus, the -$843.0 indicates a decrease in value of $843 per acre on average for the sales located within the wind farm zone. Using the median value of the non-windfarm properties (not adjusted for any variables) of $9,942 per acre, you have a -8.5% impact due to being within the wind farm.

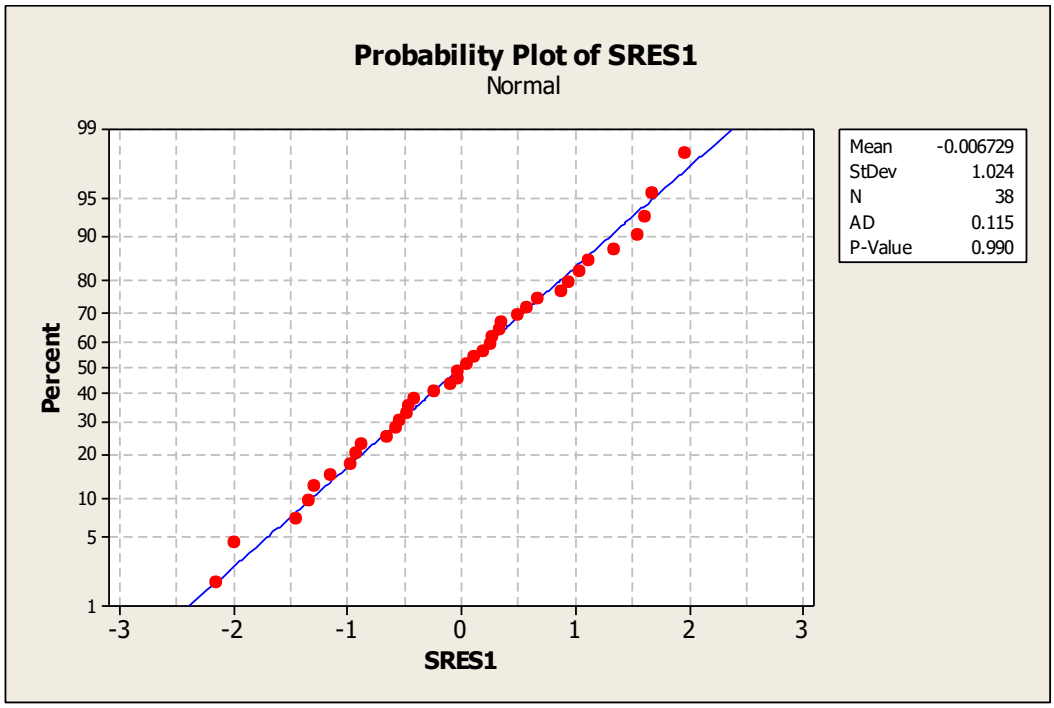
This model was checked to make sure there were no significant violations of the assumptions for regression analysis that are:

1. The regression model is linear in parameters. This means that the relationship between the predicted variable) adjusted sales price) has a linear or straight-line relationship with each predictor variable.
2. The mean of residuals is zero. This means the set actual sales prices for each farm less the model prediction of sales price in normally distributed. This is automatic by how the regression analysis is calculated, that is minimizing the square of this error over the model.
3. Homoscedasticity of residuals or equal variance. This means that the variance of the residuals does not show any patterns that either increases or decreases creating more or less error in the prediction of sales price over the range of each prediction variable. This was tested using the Anderson-Darling test indicating no issues with the distribution of the residuals.
4. No autocorrelation of residuals meaning that the terms in each prediction variable are not correlated with each other. This is tested above by the Durbin-Watson statistic where a score of 2.0 means absolutely no autocorrelation. A perfect score never happens with a real date.

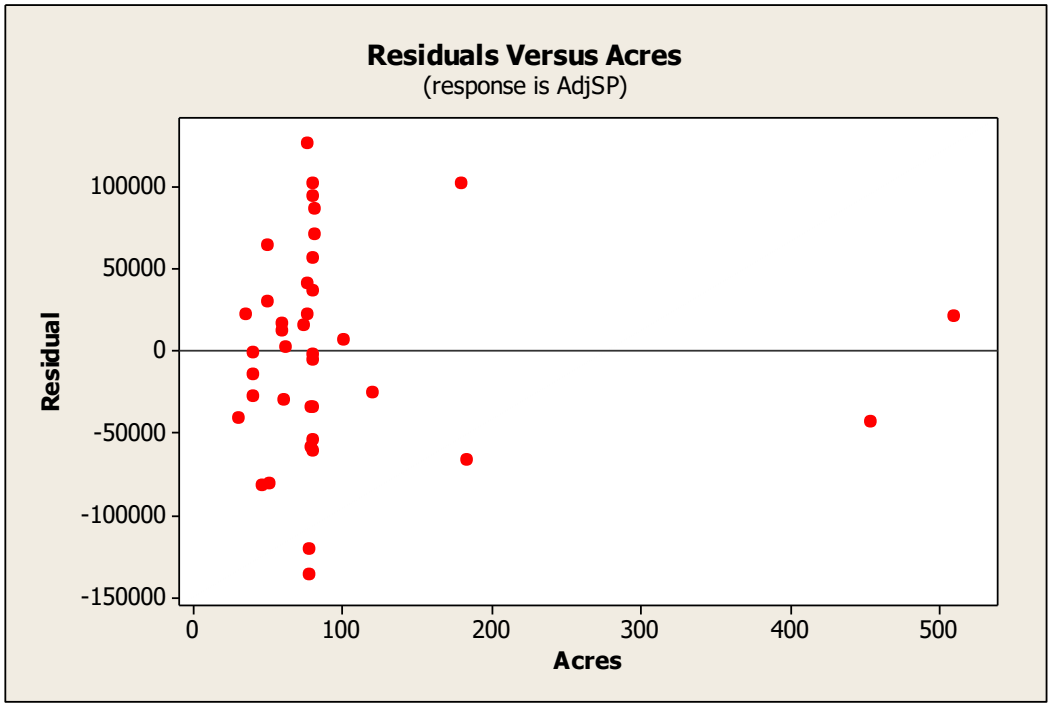
The following pages are some graphics examined looking for issues:



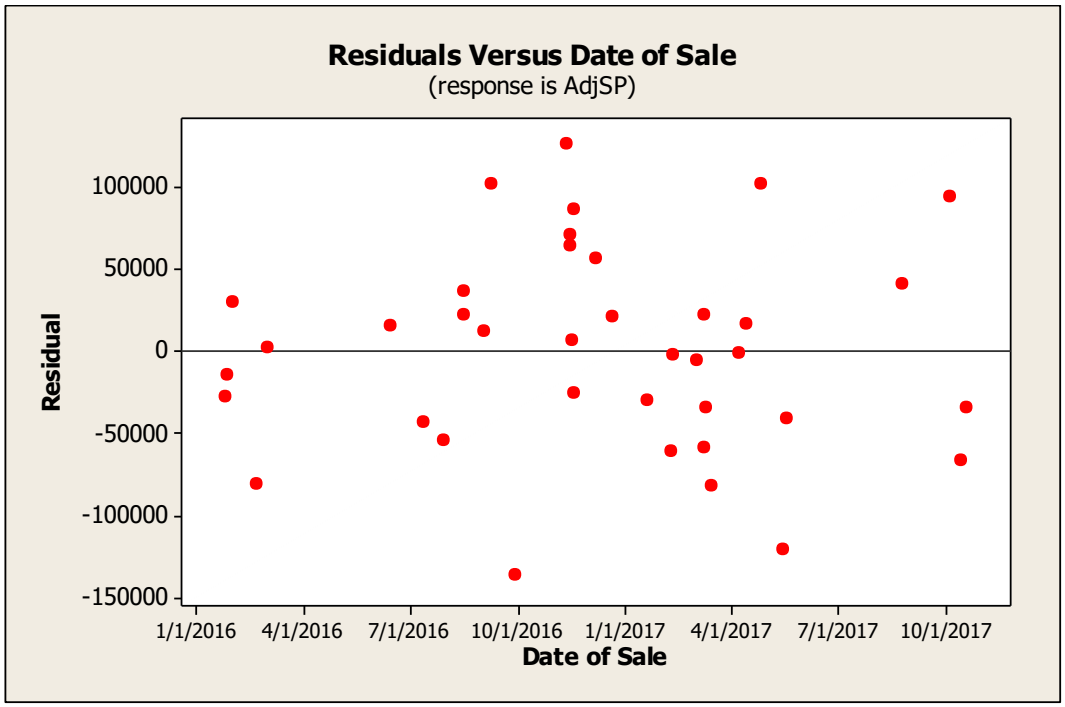
This chart shows a normal distribution of residuals.



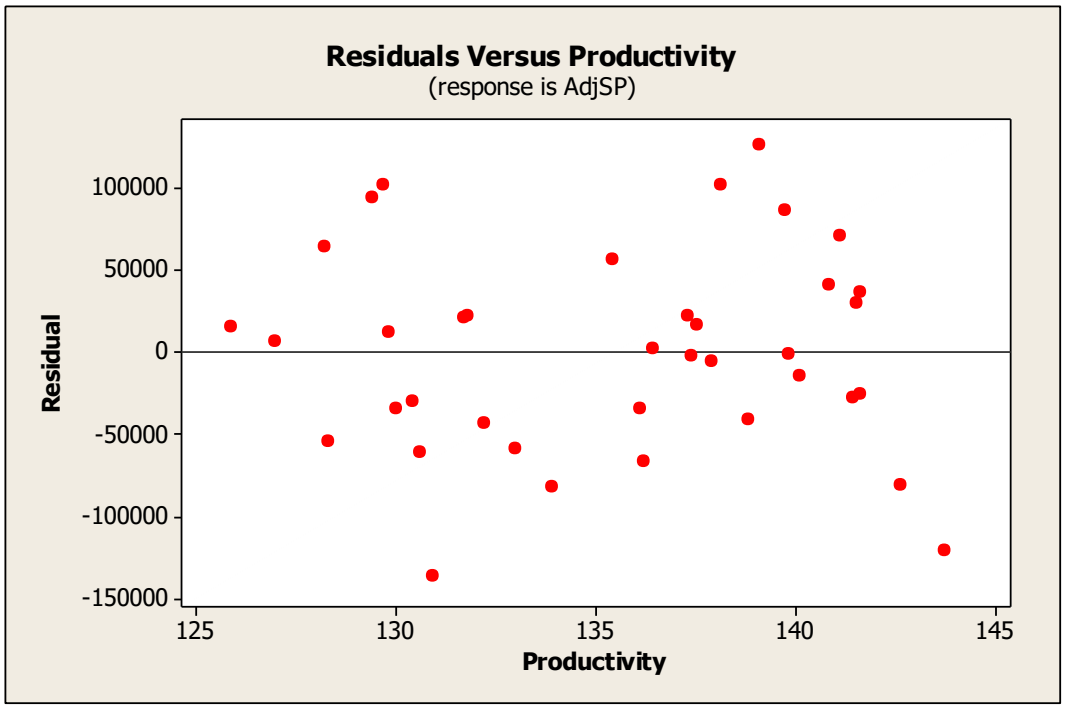
This shows the Anderson-Darling normal probability of the residuals test



This shows the residuals plotted against the number of acres in the dataset. I note that the data has two sales much larger than the rest of the data and two sales larger than the balance of the data. In this model, this is not an issue. In addition, the economics of farm sales and the numerous farm sale data examined over many cases typically show a linear relationship between price per acre and the number of acres where the acres vary functional obsolescence 20 to over 600.



This plot of residuals over time does not indicate any problems. However, it does show that more sales would be needed to have more points in the year 2016.



This last plot of residuals shows no issues.

The following section has the sales data that was used for this analysis.

LAND SALES DATA FOR TWIN GROVES II WIND FARM

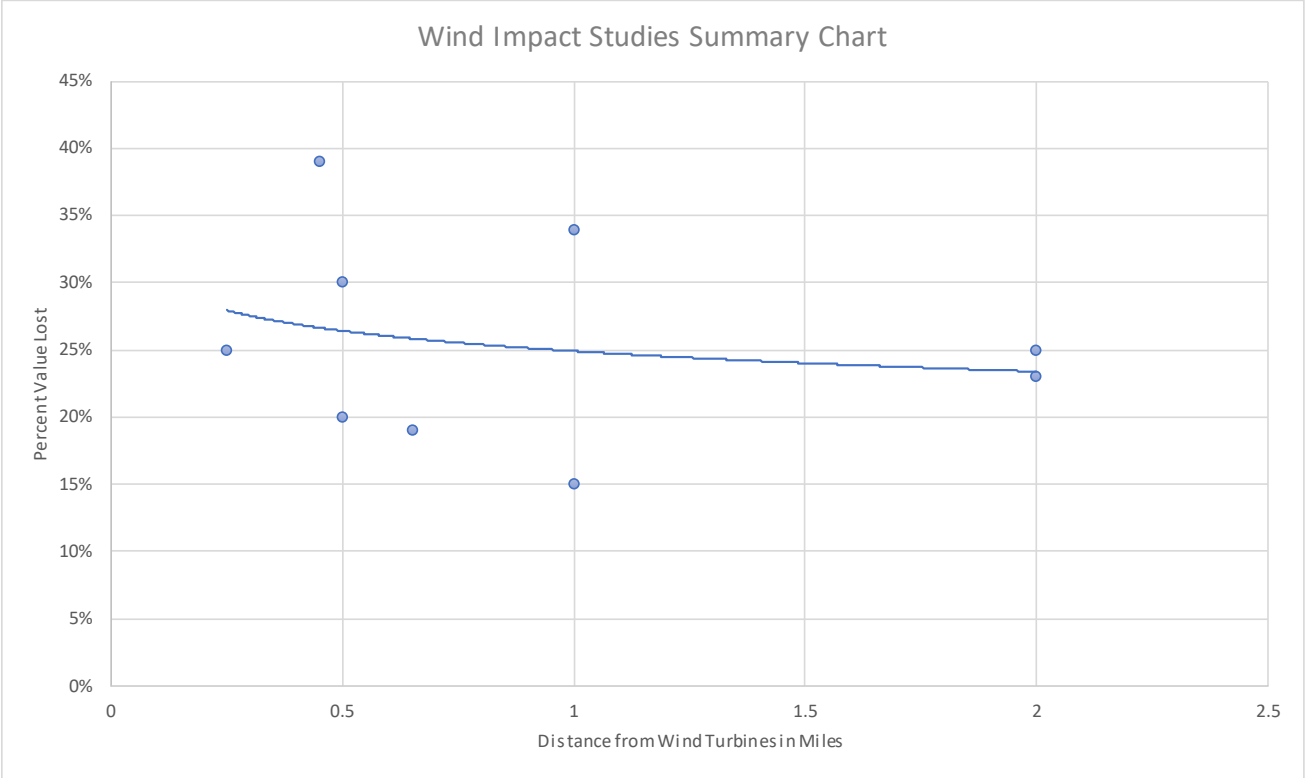
Doc File #	Parcel #	Township	Date of Sale	Sold $	Acres	$/acre	Zone	Productivity	soil rating	grd cover	WF income	Wind Farm Income Details	PV	Adj $/acre
		Wind Farm												
2016-13825	24-28-300-002;	Arrowsmith	7/12/2016	$4,494,600	454.56	$9,888	0	132.2	good	100% open	yes	$6,200/year + 2% minimum annual increase, 3 total WT, 20.5yrs	($310,303)	$9,205.16
2017-19419	24-21-400-004	Arrowsmith	10/18/2017	$715,100	78.74	$9,082	0	130.0	good	100% open	yes	$6,200/year + 2% minimum annual increase, 1 total WT, 19.2yrs	($98,048)	$7,836.58
2017-20557;	24-04-300-002	Arrowsmith	10/4/2017	$752,032	80	$9,400	0	129.4	good	100% open	no			$9,400.40
2017-21007	24-32-100-002;	Arrowsmith	10/13/2017	$1,637,592	183.33	$8,932	0	136.2	excellent	100% open	no			$8,932.48
2017-6359	24-28-100-005	Arrowsmith	4/7/2017	$400,000	40	$10,000	0	139.8	excellent	100% open	no			$10,000.00
2017-6665	24-30-300-010	Arrowsmith	4/14/2017	$677,096	59.43	$11,393	0	137.5	excellent	100% open	yes	$6,200/year + 2% minimum annual increase, 1 total WT, 19.67yrs	($100,011)	$9,710.33
2017-7913	24-02-100-003;	Arrowsmith &	4/26/2017	$1,720,641	180.22	$9,547	0	129.7	good	100% open	no			$9,547.45
2016-17858	23-22-100-004;	Dawson	9/8/2016	$880,000	80	$11,000	0	138.1	excellent	100% open	no			$11,000.00
8														
		AVERAGE			**144.535**	**$9,905**	**0**	**134.1**					**AVERAGE**	**$9,454**
		MEDIAN			**80**	**$9,718**	**0**	**134.2**					**MEDIAN**	**$9,474**
		Non-Wind Farm												
2017-1983	18-24-300-005	Anchor	1/20/2017	$524,784	60.32	$8,700		130.4	good	100% open	no			$8,700
2016-24521	32-02-100-001;	Bellflower	12/20/2016	$5,204,448	510.24	$10,200		131.7	good	100% open	no	Outbuildings - Assessed value = $6,720.00	($6,700)	$10,187
2016-24580	32-18-100-002	Bellflower	12/7/2016	$868,000	80	$10,850		135.4	excellent	100% open	no			$10,850
2016-5078	39-12-176-002	Bellflower	3/2/2016	$664,020	62	$10,710		136.4	excellent	100% open	no	Railroad abuts property		$10,710
2017-9547	32-06-300-002	Bellflower	5/15/2017	$741,000	78	$9,500		143.7	excellent	100% open	no			$9,500
2017-9230	16-13-300-002	Blue Mound	5/18/2017	$277,500	30	$7,583		138.8	excellent	100% open	no			$9,250
2016-11882	11-22-400-007	Cropsey	6/15/2016	$680,000	73.62	$9,237		125.9	good	100% open	no			$9,237
2016-4313	23-20-100-002	Dawson	2/21/2016	$528,320	50.6	$10,441		142.6	excellent	100% open	no			$10,441
2016-19420	29-26-100-003	Downs	9/29/2016	$606,550	77.24	$7,853		130.9	good	100% open	no			$7,853
2017-16275	29-34-200-004	Downs	8/24/2017	$850,704	76.64	$11,100		140.8	excellent	100% open	no			$11,100
2017-4809	29-18-200-006	Downs	3/15/2017	$363,168	46.59	$7,795		133.9	excellent	100% open	no			$7,795
2016-24275	30-01-400-008	Empire	11/15/2016	$495,000	49.79	$9,942		128.2	good	100% open	no			$9,942
2016-14845	10-06-300-002	Lawndale	7/29/2016	$696,000	80	$8,700		128.3	good	100% open	no			$8,700
2016-23072	10-02-100-002	Lawndale	11/16/2016	$947,144	100.76	$9,400		127.0	good	100% open	no			$9,400
2017-4678	10-10-400-001	Lawndale	2/8/2017	$696,000	80	$8,700		130.6	good	100% open	no			$8,700
2016-17049	09-02-200-005	Lexington	9/2/2016	$570,000	60	$9,500		129.8	good	100% open	no			$9,500
2017-4700	09-15-100-001	Lexington	3/10/2017	$776,000	80	$9,700		136.1	excellent	100% open	no			$9,700
2017-5322	09-27-200-004	Lexington	3/9/2017	$715,644	79.54	$8,997		133.0	excellent	94% open	no			$8,997
2017-4596	17-33-100-005	Martin	3/9/2017	$750,275	76.17	$9,850		131.8	good	100% open	no			$9,850
2017-4830	17-14-200-006	Martin	3/2/2017	$824,515	80.05	$10,300		137.9	excellent	100% open	no			$10,300
2017-5115	17-24-400-001	Martin	2/10/2017	$824,000	80	$10,300		137.4	excellent	100% open	no			$10,300
2017-16635	08-30-400-002;	Money Creek	8/16/2016	$920,000	80	$11,500		141.6	excellent	100% open	no			$11,500
2016-16246	08-21-300-002	Money Creek	8/16/2016	$401,005	34.87	$11,500		137.3	excellent	100% open	no			$11,500
2016-4209	22-08-100-008;	Old Town	2/1/2016	$617,763	49.45	$12,493		141.5	excellent	100% open	no			$12,493
2016-22490	15-17-100-004;	Towanda	11/12/2016	$936,156	76.03	$12,313		139.1	excellent	100% open	no			$12,313
2016-22491	15-17-300-002;	Towanda	11/18/2016	$1,258,318	119.93	$10,492		141.6	excellent	100% open	no			$10,492
2016-22492	15-17-200-003	Towanda	11/18/2016	$952,141	80.97	$11,759		139.7	excellent	100% open	no			$11,759
2016-22493	15-17-100-005	Towanda	11/14/2016	$952,141	81.01	$11,753		141.1	excellent	100% open	no			$11,753
2016-2292	38-09-100-003	West	1/26/2016	$464,000	40	$11,600		141.4	excellent	100% open	no			$11,600
2016-2293	38-09-100-004	West	1/27/2016	$464,000	40	$11,600		140.1	excellent	100% open	no			$11,600
30														
		AVERAGE			**84**	**$10,146**		**136**					**AVERAGE**	**$10,201**
		MEDIAN			**77**	**$10,250**		**137**					**MEDIAN**	**$10,243**
												Difference before adjustments for time and soil quality		-7.32%

Niyol Wind LLC Property Impact Analysis

Analysis

The literature study answered the question of whether wind farms in proximity to residential homes and agricultural land negatively impact property value with an affirmative. Next, is estimating what that impact would be. To assist in that analysis we will chart out a summary of those studies and their respective impacts by distance from the wind turbines.

Summary of Wind Farm Impact Studies		
study	distance from wind turbine in miles	negative impace to value
Twin Grove II	0.25	25%
Landsink	0.45	39%
AGO Wis	0.5	30%
Twin Grove II	0.5	20%
Big Sky	0.65	19%
Coral Springs	1	34%
Twin Grove II	1	15%
Clarkson University	2	23%
McCann	2	25%



From this chart and graph we have a better understanding on how the distance factor impacts property value. As expected, the closer the wind turbines are to the property the greater the impact.

It should be noted that in all of these studies the wind turbines in place were the older, smaller diameter and of lesser height that what is being proposed for the Niyol wind farm. The Niyol proposal has turbines being 495ft to 505ft in height. This is at least 25% greater in height and breadth than the study turbines. Therefore, it would be logical and reasonable to conclude that this size difference would cause the predictive impacts to be conservative. With that in consideration it would be reasonable to conclude the following impacts:

Properties Within the Wind Farm Footprint

The graph indicates that a -28% loss in value would be found from a distance of 1,500ft from a wind turbine. However, as we noted, those studies used smaller wind turbines. It is estimated that the proposed turbines are at least 25% greater in size. Though a direct correlation of size and impact has not been established, it would be reasonable to estimate the impact would increase by a factor of 1.25. Hence, we conclude the impact to be -35%.

Properties 1-Mile outside of the Wind Farm Footprint

The graph suggests that the impact would be less the further the distance from a wind turbine. The analysis indicates that at 2-mile distance from a turbine the impact would be -18%. Considering that the turbines were smaller in the studies it would be reasonable to increase this impact by a factor of 1.25 to conclude a -22% impact.

Agricultural Properties

Agricultural properties within the footprint, but not participating in the wind lease, will be have a -8.5% impact on property value.

Application to the Loss Estimate

Our client provided us with the residential properties located within the footprint of the Niyol wind farm and those located within 1-mile from the foot print for analysis. They are listed in the following charts along with their assessed value. We will apply the assessed value to the predicted loss to arrive at a total loss estimate due to the Niyol wind farm.

NIYOL WIND PROJECT					
AREA	SHEET	LAST NAME	ADDRESS	TOWN	ASSESSED VALUE
FOOTPRINT	2	NAB	37423 COUNTY ROAD 38	FLEMING	$110,610
FOOTPRINT	3	CHRISTOPHER	36705 COUNTY ROAD 36.5	FLEMING	$80,770
FOOTPRINT	4	BROWNELL	32600 US HIGHWAY 6	FLEMING	$93,200
FOOTPRINT	7	BOCK	34943 US HWY 6	FLEMING	$95,760
FOOTPRINT	7	BROWNELL	34403 COUNTY ROAD 34	FLEMING	$162,550
FOOTPRINT	7	LIND	35260 COUNTY ROAD 34	FLEMING	$2,510
FOOTPRINT	9	SALYARDS	15979 COUNTY ROAD 73	FLEMING	$224,030
FOOTPRINT	14	ETL	15083 COUNTY ROAD 71	FLEMING	$127,510
FOOTPRINT	14	HARRIS	35009 COUNTY ROAD 32	FLEMING	$61,180
FOOTPRINT	15	LARSON	36369 COUNTY ROAD 30	FLEMING	$144,190
FOOTPRINT	17	DONNELSON	12939 COUNTY ROAD 71	FLEMING	$161,700
FOOTPRINT	18	MCCRACKEN	13189 COUNTY ROAD 69	FLEMING	$251,150
FOOTPRINT	19	ABBOTT	32969 COUNTY ROAD 28	FLEMING	$66,040
FOOTPRINT	26	UNREIN	11751 COUNTY ROAD 71	FLEMING	$155,170
FOOTPRINT	27	PHIPPS	11150 COUNTY ROAD 67	FLEMING	no data
FOOTPRINT	28	HERICKS	32017 COUNTY ROAD 24	FLEMING	$70,390
FOOTPRINT	34	HICKERSON	10878 COUNTY ROAD 61	STERLING	$62,560
FOOTPRINT	35	KUNTZ	10257 COUNTY ROAD 63	STERLING	$97,170
FOOTPRINT	35	STEWARD	10814 COUNTY ROAD 63	STERLING	$221,360
FOOTPRINT	40	ALFLEN	9002 COUNTY ROAD 59	STERLING	$408,480
FOOTPRINT	40	NORELL	9127 HIGHWAY 61	STERLING	$140,640
FOOTPRINT	40	SCHNEIDER	9100 COUNTY ROAD 59	STERLING	$388,740
FOOTPRINT	40	WAITLEY	8963 HIGHWAY 61	STERLING	$58,550
FOOTPRINT	42	GERBITZ	28342 COUNTY ROAD 18	STERLING	$204,730
FOOTPRINT	42	VANHORN	8945 COUNTY ROD 59	STERLING	$60,200

FOOTPRINT	43	FRYE	28240 COUNTY ROAD 18	STERLING	$204,460
FOOTPRINT	45	SCHNEIDER	28486 COUNTY ROAD 16	STERLING	$58,820
FOOTPRINT	NONE	GLARDON	35510 HIGHWAY 6	FLEMING	$56,280
FOOTPRINT	NONE	MONROE	34745 COUNTY ROAD 26	FLEMING	$39,860
FOOTPRINT	NONE	PARKS	16061 COUNTY ROAD 73	FLEMING	$205,820
			Total Appraised Value of Properties within Footprint		$4,014,430
BORDER	3	KINZIE	17243 COUNTY ROAD 75	FLEMING	$145,340
BORDER	5	GERK	17249 COUNTY ROAD 69	FLEMING	$111,880
BORDER	15	STRINGHAM	13945 COUNTY ROAD 75	FLEMING	$98,650
BORDER	16	GABLE	12957 COUNTY ROAD 73	FLEMING	$126,900
BORDER	26	CANNON	35033 COUNTY ROAD 26	FLEMING	$48,820
BORDER	26	UNREIN	11149 COUNTY ROAD 71	FLEMING	$24,000
BORDER	27	HUTT	33051 COUNTY ROAD 24	FLEMING	$223,550
BORDER	35	GOOD	10991 COUNTY ROAD 65	STERLING	$198,110
BORDER	37	SCHMIDT	10301 COUNTY ROAD 69	FLEMING	$193,440
BORDER	46	DAVIDSON	6057 HIGHWAY 61	STERLING	$275,740
BORDER	48	FELZIEN & NORMAN	26765 COUNTY ROAD 12	STERLING	$139,190
BORDER	48	RINGLEIN	5462 COUNTY ROAD 55	STERLING	$258,060
BORDER		BAUDER	5245 COUNTY ROAD 63	STERLING	$166,550
BORDER		BOERNER	9198 COUNTY ROAD 71	FLEMING	$291,540
BORDER		CHAMP	36517 HIGHWAY 6	FLEMING	$165,770
BORDER		COAKLEY	10529 HIGHWAY 61	STERLING	$859,580
BORDER		CONYERS	37333 HIGHWAY 6	FLEMING	$28,690
BORDER		COOK	3917 County Road 65	STERLING	$404,770
BORDER		DAVIS	37773 HIGHWAY 6	FLEMING	$256,200
BORDER		DAY	34473 COUNTY ROAD 8	FLEMING	$59,480
BORDER		DOBBINS	35501 COUNTY ROAD 24	FLEMING	$48,020
BORDER		FISCUS	25867 COUNTY ROAD 12	STERLING	$136,580

BORDER		FRANTZ	14385 COUNTY ROAD 77	FLEMING	no data
BORDER		HERSKIND & WORKMAN	2721 COUNTY ROAD 73	FLEMING	$145,440
BORDER		JAPP	36400 COUNTY ROAD 22	FLEMING	$111,880
BORDER		LOUSBERG	10235 COUNTY ROAD 79	FLEMING	$474,670
BORDER		MARSHALL	13313 COUNTY ROAD 75	FLEMING	$241,890
BORDER		MUNSON	12340 COUNTY ROAD 71	FLEMING	$123,990
BORDER		PALSER	41924 COUNTY ROAD 41	OTIS	??
BORDER		RAY	16413 COUNTY ROAD 75	FLEMING	$137,560
BORDER		SERRATO	37299 HIGHWAY 6	FLEMING	$154,570
BORDER		SCHMIDT	9571 COUNTY ROAD 71	FLEMING	$438,920
BORDER		SMITH	4296 COUNTY ROAD 53	STERLING	$96,300
BORDER		SONNENBERG	27189 COUNTY ROAD 24	STERLING	$260,660
BORDER		SWINDELL	5083 HIGHWAY 61	STERLING	$168,740
BORDER		UNREIN	9501 COUNTY ROAD 69	FLEMING	$82,870
BORDER		VANDENBARK	14450 COUNTY ROAD 75	FLEMING	$250,240
BORDER		VANDENBARK	COUNTY ROAD 75	FLEMING	$370
			Total assessed value of Border Homes		$6,948,960

BORDER are homes located 1-mile outside of footprint

Applying the assessed values to the estimated impacts we have the following conclusions:

Niyol Wind Farm Loss to Property Value Estimate			
	total assessed value	**impact**	**value loss**
Properties within the Footprint	$4,014,430	-35%	-$1,405,051
Properties 1-mile outside of the Footprint	$6,948,960	-22%	-$1,528,771
Total			**-$2,933,822**

Addendum

Curriculum Vitae of Kurt C. Kielisch

Work Experience

As of January 2020, I have 36 years of experience in the appraisal field. During this tenure I have completed over 8,100 valuations totaling $13.1+ billion dollars.

As a practitioner, I entered the appraisal industry in 1984 employed by ValuPruf Valuation Service, Milwaukee, Wisconsin. Appraisal assignments through the years have included the following: single-family residential, multi-family residential, dairy farms, crop farms, horse ranches, cattle ranches, commercial properties, special use properties, tax assessment, ocean-front properties and islands, stigmatized properties, eminent domain, utility easements, valuation consulting, litigation support work and impact studies. I have provided appraisal services for properties located in Alaska, Colorado, Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Mississippi, Missouri, Nebraska, New Mexico, North Dakota, Ohio, Pennsylvania, South Dakota, South Carolina, Virginia, Wisconsin, and Wyoming.

As a communicator, I have authored the book: *The Listing Appraisal Program* (ATI press, 1996) and three magazine articles: *Dead Body Appraisers* (The Appraisal Buzz, October 3, 2002), *Expert Testimony and Reports: Is Change Good?* (Working R.E. Magazine, February 2002), and *Rails to Trails Property Rights* (Right of Way Magazine, Nov/Dec 2012). I have been engaged in valuation related research projects on the impacts of high voltage transmission lines, natural gas pipelines, oil pipelines, wind farms and solar farms on property value. Related to the impact on property value of utility projects, wind and solar farms, I have given testimony before the Wisconsin Senate Committee, Wisconsin Public Service Commission, Wisconsin Wind Farm Siting Council, Illinois Wind Farm Siting Councils, Missouri Public Service Commission and the Wyoming Industrial Committee. Our research has been utilized by other appraisers, experts and property owners when arguing before government committees, public service counsels, courts and in reports.

As an expert witness, I have been an approved expert in Wisconsin, Kansas, North Dakota, South Dakota and Virginia state courts, commissioner hearings in Wisconsin and Minnesota, mediation in Indiana and Illinois, and Federal Courts in Wisconsin, Kansas and Ohio. In the Wisconsin Supreme Court case of Spiegelberg vs. State of Wisconsin DOT (2004AP3384), I was the principle appraiser for Ms. Spiegelberg. This hearing resulted in a majority decision in favor of my client making a landmark decision relating to the proper valuation methodology when appraising property involved in eminent domain to obtain just compensation. In the Wisconsin Supreme Court decision of Waller vs. American Transmission Corporation, LLC (2012AP805 & 2012AP840) the high court overwhelming found in favor of my client and made a landmark decision involving relocation rights and an uneconomic remnant. I was the principle appraiser and expert witness for the Wallers.

As an educator, I taught appraisal pre-licensing and continuing education courses throughout a multi-state area from 1994 to 2000. During this time, I authored course curriculum for seven pre-licensing courses and twelve continuing education courses as well as the creation of a two-year professional appraiser training program. Since 2000, I have given presentations for professional continuing education (IRWA – Badger Chapter, The American Law Institute and CLE Annual Eminent Domain Conferences (2013, 2014, 2016), IRWA Annual Conference (2013) and for general information at many public meetings.

Academics

M.A. Education. Regent University, Virginia Beach, Virginia. This degree concentrated on the adult learner and state-of-the-art communication technology to enhance learning. The focus was on the adult learner.

B.A. Business Administration (Economics Minor). Lakeland College, Sheboygan, Wisconsin.

B.A. Biology (Natural Sciences Minor). Silver Lake College, Manitowoc, Wisconsin.

Certifications/Designations/Organizations

Certified General Real Property Appraiser State of Illinois. License #553.002453 (Expires 9/30/2021)
Certified General Real Property Appraiser State on Indiana. License #CG41500059 (Expires 6/30/2020)
Certified General Real Property Appraiser State of Nebraska. License #CG2020016R (Expires 12/31/20)
Certified General Appraiser State of South Dakota. License #1443CG (Expires 9/30/2020).
Certified General Appraiser State Pennsylvania. License #GA004389 (Expires 6/30/2021).
Certified General Appraiser State of Virginia. License #016559 (Expires 3/31/2021).
Certified General Appraiser State of Wisconsin. License #1097-010 (Expires 12/14/2021).
Temporary Certified General Licenses. Colorado, Illinois, Indiana, Iowa, Kansas, Nebraska, New Mexico, Mississippi, Missouri, Ohio, and Wyoming.
Past Certified General Appraisal Licenses. Iowa, Kansas, Michigan, Minnesota, North Dakota, Ohio, and Wyoming.
ASA (real property) Urban Designated Member. American Society of Appraisers (ASA).
SR/WA (Senior Member) Designated Member. International Right-of-Way Association.
R/W-AC (Appraisal Certified Member) Designated Member. International Right-of-Way Association.
IFAS (Senior Member) Designated Member (designation now retired). National Association of Independent Fee Appraisers (now merged with the ASA).
Review Appraiser (past). Department of Regulation and Licensing, State of Wisconsin (contract position).
Associate Member. Appraisal Institute (AI).
Approved Contract Appraiser. Wisconsin Department of Natural Resources (DNR).
REALTOR member. Realtors Association of Northeast Wisconsin and National Association of Realtors.
Approved R.E. Appraisal Instructor (past). Virginia, Maryland, Indiana, Illinois, Minnesota, and Wisconsin.
Assistant Editor. ASA-Real Property quarterly newsletter (2012-2014).
Faculty. Eminent Domain and Land Valuation Litigation, The American Law Institute – CLE: Miami Beach, FL (January 2013) and New Orleans, LA (January 2014). Eminent Domain Impact of Political & Economic Forces, Eminent Domain Institute CLE International (September 2013), Cleveland, Ohio. Eminent Domain: Current & Emerging Issues, Eminent Domain Institute-CLE International (September 2016), Las Vegas, NV.
Seminar Instructor. International Right-of-Way Annual Conference (2013), Charleston, West Virginia (topic Valuation of Rails to Trails Corridors); International Right-of-Way Appraisal Day Seminar (May 13, 2014) Ohio IRWA Chapter 13 (topic Valuation of Utility Corridors).

Appraisal/Real Estate Courses (29 courses, 572hrs)

Fundamentals of Real Property Appraisal (40hrs). IAAO, University of Virginia, Charlottesville, VA.
Income Approach to Valuation (40hrs). IAAO. University of Virginia, Charlottesville, VA.
Real Estate Appraisal (45hrs). Alpha College of Real Estate [Instructor].
Uniform Standards of Professional Appraisal Practice (15hrs). Alpha College of Real Estate [Instructor].
Appraising the Small Income Residential Property (15hrs). Alpha College of Real Estate [Instructor].
Advanced Income Appraisal I (30hrs). Alpha College of Real Estate [Instructor].
Advanced Income Appraisal II (30hrs). Alpha College of Real Estate [Instructor].
Residential Construction, Design & Systems (20hrs). Appraisal Training Institute [Instructor].

Residential Cost Approach & Depreciation Methods (20hrs). Appraisal Training Institute [Instructor].
Residential Market Approach & Extraction Methods (20hrs). Appraisal Training Institute [Instructor].
Computer Applications in Appraisal Report Writing (15hrs). Appraisal Training Institute [Instructor].
Completing the URAR in Compliance with FNMA Guidelines (15hrs). Appraisal Training Institute [Instructor].
The Residential Appraisal Process (20hrs). Appraisal Training Institute [Instructor].
Residential Appraisal Practicum (40hrs). Appraisal Training Institute [Instructor].
Pipeline ROW Agent's Development Program: Course 215 (16hrs). International Right-of-Way Association.
Eminent Domain Law Basics for Right-of-Way Professionals: Course 803 (16hrs). International Right-of-Way.
Financial Analysis of Income Properties (16hrs). National Association of Independent Fee Appraisers (NAIFA).
Appraisal of Partial Acquisition: Course 401 (40hrs). International Right-of-Way Association.
National Uniform Standards of Professional Appraisal Practice (USPAP): Course 2005 (15hrs). NAIFA.
Easement Valuation: Course 403 (8hrs). International Right-of-Way Association.
Principles of Real Estate Negotiation: Course 200 (16hrs). International Right-of-Way Association.
Bargaining Negotiations: Course 205 (16hrs). International Right-of-Way Association.
Principles of Real Estate Appraisal: Course 400 (exam). International Right-of-Way Association.
Principles of Real Estate Law: Course 800 (exam). International Right-of-Way Association.
Principles of Real Estate Engineering: Course 900 (exam). International Right-of-Way Association.
SR/WA Comprehensive Exam: International Right-of-Way Association.
Course 420: Business Practices & Ethics (8hrs). Appraisal Institute.
United States Land Titles (16hrs). International Right-of-Way Association.
Quantitative Analysis (40hrs). Appraisal Institute.

Appraisal/Real Estate Seminars (59 courses, 304.9hrs)

Real Estate Taxation (7hrs). University of Wisconsin: Continuing Education Division.
Review Appraising as the Supervising Appraiser (3hrs). Appraisal Training Institute [Instructor].
Legal Ramifications of Environmental Laws (3hrs). International Association of Assessing Officers (IAAO).
Virginia State Mandatory Continuing Education (4hrs). Appraisal Training Institute [Instructor].
Appraising the Small Income Property (8hrs). Appraisal Training Institute [Instructor].
Listing Appraisals (7hrs). Appraisal Training Institute [Instructor].
Marshall & Swift Residential Cost Approach: Sq. Ft. Method, (7hrs). Western Illinois University [Instructor].
Marshall & Swift Residential Cost Approach: Segregated Method, (7hrs). Western Illinois University [instars].
Residential Construction, Design and Systems (7hrs). Appraisal Training Institute [Instructor].
EMF and Its Impact on Real Estate (4hrs). Appraisal Training Institute [Instructor].
Easements and Their Effect on Real Estate Value (7hrs). Appraisal Training Institute [Instructor].
Exploratory Data Analysis: A Practical Guide for Appraisers (3hrs). Appraisal Institute.
Residential Statistical Modeling (3hrs). Appraisal Institute.
Valuation Modeling: A Case Study (3hrs). Appraisal Institute.
Real Estate Valuation Cycles (3hrs). Appraisal Institute.
Subdivision Analysis (3hrs). Appraisal Institute.
Appraisal of Nursing Facilities (7hrs). Appraisal Institute.
National Standards of Professional Appraisal Practice: Course 400 (7hrs). Appraisal Institute.
Land Valuation Adjustment Procedures (7hrs). Appraisal Institute.
Valuation of Detrimental Conditions in Real Estate (7hrs). Appraisal Institute.
Appraising Conservation Easements (7hrs). Gathering Waters Conservancy.
ROW Acquisition in an Environment of Power Demand Growth & Legislative Mandates (12hrs). IRWA - Minnesota.
Analyzing Distressed Real Estate (4hrs). Appraisal Institute.
7 Hour National USPAP Course for 2008-2009 (7hrs). International Right-of-Way Association.
6th Annual Condemnation Appraisal Symposium (6hrs). Appraisal Institute.
Contemporary Issues in Condemnation Appraisal (4hrs). Appraisal Institute.
7-Hour National USPAP course for 2010 (7hrs). International Right-of-Way Association.

Real Estate Finance Statistics and Valuation Modeling (14hrs). Appraisal Institute.
Michigan Law Update (2hrs): McKissock.
Local Public Agency Real Estate Seminar 2010 (6hrs). Wisconsin Department of Transportation.
8th Annual Condemnation Appraisal Symposium (6hrs). Appraisal Institute.
Golf & Hotel Valuation (3.4hrs). International Right-of-Way Association.
7-Hour National USPAP course for 2012 (7hrs). International Right-of-Way Association.
Statistics, Modeling, and Finance (14hrs). McKissock.
Eminent Domain Issues in the Pipeline Industry: IRWA 2013 Conference (1.5hrs).
Pipelines: Abandoned vs. Idle/Consequences of Not Maintaining Your Easements or ROW. IRWA 2013 Conference (1.5hrs).
The Right of Reversion, "Who's on First." IRWA 2013 Conference (1.5hrs).
Ad Valorem Tax Consultation (2hrs). McKissock.
Appraisal Applications of Regression Analysis (7hrs). McKissock.
Valuation of Avigation Easements (3hrs). ASA Wisconsin Chapter (Instructor)
11th Annual Condemnation Symposium. Appraisal Institute – Wisconsin Chapter. (6hrs)
7-Hour National USPAP course for 2014-2015 (7hrs). Appraisal Institute
Uniform Standards for Federal Land Acquisitions – Appraisal Institute – Florida Chapter (16hrs)
A Review of Disciplinary Cases: How to Avoid a Visit with the Licensing Board (3hrs), McKissock.
Eminent Domain Current & Emerging Issues- Eminent Domain Institute (2016), CLE International – Las Vegas (12hrs)
13th Annual Condemnation Symposium. Appraisal Institute – Wisconsin Chapter. (6hrs)
Marcellus Shale: Effects of Energy Resource Operations on Residential Property Value (3hrs). McKissock.
7-Hour National USPAP course for 2016-2017 (7hrs). McKissock.
IRWA Aviation Easements Seminar (2hrs). International Right-of-Way Association.
Review of Disciplinary Cases (3hrs). McKissock.
The Dirty Dozen (3hrs). McKissock
Attacking & Defending While Staying out of Trouble (2hrs). American Society of Appraisers.
Introduction to Expert Witness Testimony for Appraisers (4hrs). McKissock.
Pennsylvania State Mandated Law for Appraisers (2hrs). State Board of Certified Real Estate Appraisers.
15th Annual Condemnation Symposium. Appraisal Institute – Wisconsin Chapter. (6hrs)
Evaluations, Desktops and other Limited Scope Appraisals (4hrs). McKissock.
7-Hour National USPAP course for 2018-2019 (7hrs). McKissock.
16th Annual Condemnation Symposium. Appraisal Institute – Wisconsin Chapter. (6hrs)
REALTOR Code of Ethics (0hrs). The National Association of Realtors.

EXPLANATION OF DESIGNATIONS

ASA-Urban Real Property: The ASA designation is the senior designation granted by the American Society of Appraisers, which is the only multi-discipline international appraisal association in America. The ASA-Urban designation requires the passing of five advanced level commercial appraisal courses, the passing of a comprehensive exam, a passing grade on a demonstration narrative report, 5 years full-time appraisal experience, a Certified General appraisal license and the recommendation of the local and national membership committee. All ASA designated members must adhere to the Code of Ethics of the Association and keep up-to-date with continuing education (Source: www.appraisers.org).

IFAS (now retired): For this senior level designation from the International Fee Appraisal Association the appraiser must meet the requirements for the Member [IFA], successfully pass the Senior Member Examination, score a passing grade on a narrative demonstration report on an income-producing property conforming to prescribed guidelines and meet educational and experience requirements as outlined by the Association. In addition, the designation requires a minimum of 4 years appraisal experience in commercial type properties, a State Certified General Appraisal license, successful completion of over 200-hours of appraisal course work, completion of the current USPAP course, a college degree and the recommendation of the appraiser's peers and local chapter (Source: www.naifa.com). All IFAS members must adhere to the Code of Ethics of the Association and keep up-to-date with continuing education.

Senior Right of Way (SR/WA): This is the most prestigious professional designation granted by the International Right-of-Way Association to members who have achieved professional status through experience, education, and examination. The SR/WA designation requires training and examination in seven major right-of-way disciplines. The SR/WA designation says, "I have more than five years of right-of-way experience, plus I have had formal training in a wide variety of right-of-way areas." The SR/WA professional may be a specialist in one area such as appraisal, engineering, or law, but also must be familiar with the other seven disciplines associated with the right-of-way profession. Additional requirements for the SR/WA designation include: a bachelor's degree, 5 years right-of-way experience, successful completion of four core courses and four elective courses, passing the all-day comprehensive exam and recommendation from the designee's peers and local chapter. The SR/WA designation is the only designation reflecting evidence of professional attainment in the right-of-way field (Source: www.irwaonline.org). All SR/WA members must adhere to the Code of Ethics of the Association and keep up-to-date with continuing education.

Right of Way Appraisal Certified (R/W-AC): The Right of Way (R/W) Certification is an esteemed professional designation granted to members who have achieved professional status through experience, education, and examination in a specific discipline. Earning this certification demonstrates an unparalleled achievement in a single discipline and reinforces a standard of excellence in services provided to the public (Source: www.irwaonline.org). All R/W-AC members must adhere to the Code of Ethics of the Association and keep up-to-date with continuing education.

Appraiser's Certification

I certify that to the best of my knowledge and belief:

- The statements of fact contained in this report are true and correct.
- The reported analyses, opinions, and conclusions are limited only by the reported assumptions and limiting conditions and are my personal, impartial and unbiased professional analyses, opinions, and conclusions.
- I have no present or prospective interests in the property that is the subject of this report and no personal interest with respect to the parties involved.
- I have no bias with respect to the property that is the subject of this report or to the parties involved with this assignment.
- My engagement in this assignment was not contingent upon developing or reporting predetermined results.
- My compensation for completing this assignment is not contingent upon the development or reporting of a predetermined value or direction in value that favors the cause of the client, the amount of the value opinion, the attainment of a stipulated result or the occurrence of a subsequent event directly related to the intended use of this appraisal.
- My analyses, opinions, and conclusions were developed, and this report has been prepared, in conformity with the Uniform Standards of Professional Appraisal Practice.
- I have made a personal inspection of the property that is the subject of this report.
- No one provided significant real property appraisal assistance other than staff members employed by Forensic Appraisal Group for research and comparable sales confirmation. That individual was Appraisal data technician, Stacy Martin, and staff appraiser James D. Marske.

Signed on June 12, 2020.

Kurt C. Kielisch, ASA, SR/WA, R/W-AC
President/Senior Appraiser