WIND TURBINES AND PROPERTY VALUES

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PRESIDENT

REAL PROPERTY ANALYTICS
OVERVIEW

- Review of correct appraisal methodologies to measure diminution in value
- Groce’s analysis
- Analysis of potential market effects due to development and presence of wind turbines
  - Case study
  - Market study
  - Literature review
- Concluding thoughts
“To understand perceptions within the real estate market, market data must be used to measure how the market actually reacts.” (Bell, Real Estate Damages, published by the Appraisal Institute in 2016, page 1)

What is market data?
Market Data = Sales Transactions

“…stigma for the appraisal profession is the product of uncertainty and adverse perceptions of the market but is always measured on the basis of **actual market data and transactions** that reflect these perceptions. The appraiser is cautioned that not all uncertainty and increased concern and perceptions in the market may reduce property values, and that any analysis of risk effects and stigma must be based on actual data from the relevant market or submarket and should not be assumed to occur without such evidence.” (Guide Note 6, published by the Appraisal Institute)
Diminution in value can be measured through paired sales analysis

**Paired sales analysis:** prices paid for properties that sold in an impacted area are compared to prices paid for otherwise similar properties that sold outside the impacted area in order to estimate the effect of the location on sale price
GENERALLY ACCEPTED APPRAISAL METHODOLOGY

- Tax assessed value ≠ market data

- “The objective of tax assessment is the equitable distribution of the tax burden based on real property value, but tax assessors do not attempt to develop opinions of value for specific parcels of property for use outside of ad valorem taxation.” (The Appraisal of Real Estate, published by the Appraisal Institute, page 216)

- Jarod Groce defines “tax value” as “that amount determined by the local appraisal district on which your property taxes are based, and are typically three or more years behind”
Jarod Groce identifies and categorizes sales as follows:

- “Land Sales Near Muenster Wind Turbines” in 3 separate categories
  - “Sales in Close Proximity to Existing Wind Towers” (4 sales)
  - “Sales in Close Proximity to Existing Wind Towers, but Not Visible” (2 sales)
  - “Sales in Close Proximity to Current Wind Turbines, but Not at the Time of Sale” (3 sales)
- “Land Sales In Proposed Windfarm Area” (21 sales)
Groce’s procedure for analyzing the sales in each category:

1) Total the CCAD values (tax assessed values) for all of the sales in each category
2) Total the sale prices for all of the sales in each category
3) Compare the total of all sale prices to the total of all CCAD values for each category using the following ratio:

\[
\text{roce Ratio} = \frac{\text{Sale Price}}{\text{CCAD Value}}
\]
J. GROCE ANALYSIS: OVERVIEW

- Groce’s Results
  - “Sales in Close Proximity to Existing Wind Towers” had a ratio less than 100%
  - Sales in the remaining three categories had a ratio greater than 100%
  - Groce concludes from this analysis that the proximity to turbines caused the difference in ratios
GROCE’S METHODOLOGY HAS A NUMBER OF FLAWS AND CONTRADICTS ACCEPTED APPRAISAL METHODOLOGY

<table>
<thead>
<tr>
<th>Data</th>
<th>Analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Choice of sales</td>
<td>1. Comparison of tax assessed values to market values</td>
</tr>
<tr>
<td>a. Assumes all sales are land only, when in fact several are residential</td>
<td>a. Tax assessed values are not market values. The two are different measures and therefore, it is inappropriate to compare the two as a proxy for diminution in value.</td>
</tr>
<tr>
<td>b. Some of the sales Groce uses are unusual or have non-typical features (e.g., distressed sale)</td>
<td></td>
</tr>
<tr>
<td>c. The sales chosen are a small, unrepresentative subset of the entire area and the analysis ignores the majority of sales activity</td>
<td>2. Misrepresentation of data analyzed</td>
</tr>
<tr>
<td>d. The information about the sales utilize incorrect or unverifiable (against tax records or MLS) information.</td>
<td>a. When compared to tax assessed value, the arms-length sales closest to a wind turbine sold well above the tax assessed value.</td>
</tr>
</tbody>
</table>
About 1/3 of the properties analyzed had houses on them at the time of sale. Groce does not adjust or account for the presence of residential improvements in his analysis.

For example, consider 2070 CR 329, Gainesville:

- MLS #13847296
- House built in 2014
- 3,000+ square feet
- 2018 Sale Price: $490,750
- Groce CCAD value compared to: $213,991
- Actual CCAD value of this property in 2018: $491,905
- Ratio is artificially inflated, which skews the analysis

Groce says this property sold for 229% of CCAD’s tax value, when in reality it sold for a little less than 100% of CCAD’s tax value
DATA: GROCE’S ANALYSIS IGNORES THE MAJORITY OF SALES ACTIVITY THAT HAS OCCURRED IN THE AREA

- Groce considers:
  - 9 sales near Muenster Wind Turbines (outlined in purple or yellow)
  - Study Period: 2011-2019
  - 5 land sales, 4 residential
  - Wind turbines are the grey dots
  - (photograph is from Groce presentation, p. 9)
DATA: GROCE’S ANALYSIS IGNORES THE MAJORITY OF SALES ACTIVITY THAT HAS OCCURRED IN THE AREA

- Total number of properties sold between 2011 – 2019:
  - 46 sales (red dots)
  - 19 land sales, 27 residential
- Groce ignores over 80% of the sales in the area. His analysis is not representative of the broader real estate market during the time of the analysis.
  - This figure is larger if the town of Muenster is included.
Groce states, “market value is defined as the price that a ready, willing, and able buyer would pay to a ready, willing, and able seller, in an arm’s length transaction that is not brought on by a distress situation.”

- 3 of the 4 “impaired sales” are distressed sales.
- Distressed sales bring lower prices and do not represent the broader market.
- These lower sales prices are not attributable to the presence of wind turbines.

### DATA: GROCE’S “IMPAIRED SALES” ARE IN FACT DISTRESSED SALES

<table>
<thead>
<tr>
<th></th>
<th>457 CR 459</th>
<th>457 CR 459</th>
<th>2540 N FM 373</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Property Type</strong></td>
<td>Land Only</td>
<td>Rural Residential</td>
<td>Land Only</td>
</tr>
<tr>
<td><strong>Intended Use by Buyer</strong></td>
<td>Agricultural</td>
<td>Residential</td>
<td>Agricultural</td>
</tr>
<tr>
<td><strong>Unique Characteristics</strong></td>
<td>Wind turbines next door. Owners of neighboring property purchased.</td>
<td>Property sold at auction</td>
<td>Wind turbines on property</td>
</tr>
<tr>
<td><strong>Distressed Sale (Y/N)</strong></td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td><strong>Notes</strong></td>
<td>MLS #11634383; Price reduced for quick sale: seller trying to sell land to pay for adjacent home in foreclosure</td>
<td>MLS #13534257; Foreclosure</td>
<td>MLS # 13483387; Motivated seller: divorce</td>
</tr>
</tbody>
</table>

**Additional Notes:**
- MLS #11634383: Foreclosure
- MLS #13534257: Motivated seller: divorce
- MLS # 13483387: Motivated seller: divorce
Groce’s last “impaired property” shows there is still demand for residential properties and that the highest and best use does not necessarily change due to the presence of wind turbines.

- Sold for $6,500/acre
- Groce states that properties in the Era area are selling for “over $6,400 per acre today.” This sale is in line with Groce’s reported average market value for the Era area.
Groce compares the 4 “impaired” sales (“Sales in Close Proximity to Wind Towers”) to 5 other sales in Muenster that he considers “unimpaired”

These “unimpaired” sales are divided into two categories

1. “Sales in Close Proximity to Existing Wind Towers, but Not Visible”
   a. These two sales are less than 600 feet from wind turbines, closer than 3 of the 4 “impaired” sales
   b. Contrary to Groce’s assertion, wind turbines were indeed visible from at least one of these properties
   c. Groce states that these sales were unaffected by the presence of the wind turbines (sold for an average of 146.98% of CCAD’s tax value)

2. “Sales in Close Proximity to Current Wind Turbines, but not at the Time of Sale”
   a. These properties sold between 2010 and 2014
   b. Groce states that these properties sold for an average of 134.56% of CCAD’s tax value
175 Mau Drive

- MLS #13387221
- Categorized as a “Sale in close proximity to existing wind towers, but not visible”
- Sold for 108.1% of the CCAD Tax Value
- On the market for 11 days
- Has wind turbines as close as 140 feet from the main house (less than half of a football field)
MLS photos of 175 Mau Drive shows turbines visible from the house.

According to Groce, a higher sales price to assessed value (in this case, 108.1%) is a positive indication, not a detrimental one.

This sale contradicts Groce’s claim that nearby or visible turbines damage property values. Conversely, this sale indicates no effect due to proximity to wind turbines.
SUMMARY OF FLAWS IN GROCE’S DATA

- Including both land and residential properties in an analysis, as well as omitting more than 80% of the sales activity in the area, creates unreliable conclusions about the market activity in Muenster during that time and artificially inflates Groce’s ratios.

- Three of Groce’s “impaired” sales prices in close proximity to existing wind turbines were in fact distressed sales. Groce incorrectly attributes the lower sales prices to the presence of wind turbines, when in fact the lower prices were due to the distressed sale conditions (foreclosure and divorce proceedings). Real estate agents involved in these sales confirmed that the presence of the wind turbines did not have a negative effect on the sales price for these transactions.

- Groce’s remaining “impaired” transaction sold at market value. The buyer also intended to build a home and live on the property full time, indicating continued demand for residential use of land proximate to wind turbines.

- The 2 “unimpaired” sales Groce uses are actually located closer to turbines than the “impaired” sales and sell at higher sales price to assessed value rates. The turbines were visible from at least one of the sales. This contradicts Groce’s conclusion that property values are lower near wind turbines.
ANALYSIS: TAX ASSESSED VALUE IS NOT A MARKET VALUE

- Real estate appraisers are admonished not to treat tax assessed value, or taxable value, as if it were a reflection of market price.
  - “Assessed values may not be good indicators of the market value of individual properties…” (Appraisal of Real Estate, 14th edition, p 197)
  - Defined as “[t]he value of a property according to the tax rolls in ad valorem taxation; may be higher or lower than market value…” (Dictionary of Real Estate Appraisal, 6th edition, p. 28)

- Comparing a sale price to its tax assessed value to determine a “discount” or “premium” is a flawed analysis. By comparing the two values, it assumes a common and consistent relationship between the two that does not exist. The two values are different and it is inappropriate to compare them as a proxy for diminution in value.

- Groce defines tax value as “that amount determined by the local appraisal district on which your property taxes are based...This is NOT a fee appraisal, nor a true representation of the current value of a property.”

- Because tax assessments of value reflect other considerations besides value, they cannot be used as a measure of “true” current value as Groce implies.
Groce’s conclusions misrepresent the data he analyzes

Groce concludes, “properties right here in Cooke County, TX that have a wind turbine on or near them, bring FAR less than properties that are not impacted by wind turbines. Using Cooke County Appraisal District’s tax values as the baseline, properties near a wind turbine have a selling price that is 20.25% BELOW THE TAX VALUE.”

In reality, 3 of Groce’s 4 “impaired” sales are not arms-length, market transactions – but instead were distressed sales that Groce agrees is not an indicator of market value

The arms-length “impaired” sale, as well as the two additional two arms-length sales less than 600 feet from wind turbines, sold for an average of approximately 132% of CCAD’s tax value, NOT 20.25% below the tax value
ANALYSIS OF POTENTIAL EFFECTS FROM WIND TURBINES

- Paired sales analysis
  - Prices paid for properties that sold near wind turbines are compared to prices paid for otherwise similar properties not proximate to wind turbines in order to estimate the effect of the location on sale price

- Market trend analysis
  - Looking at overall sales trends over time in the Muenster study area vs. Cooke County overall to understand how the installation of wind turbines affected sales prices

- Literature review for supplementary support
  - Academic literature performed on a number of different datasets and using varying methodologies have consistently shown no evidence of effects of proximity or view of wind turbines
Groce identified two arms-length land sales proximate to the Muenster wind turbines.

Both of these sales were paired with otherwise similar comparable sales removed from the wind turbine area for purposes of determining any diminution in value attributable to the presence of the wind turbines.
## PAIRED SALE #1 – FM 373, MUNSTER (WIND TURBINES VISIBLE)

<table>
<thead>
<tr>
<th>FEATURE</th>
<th>SUBJECT PROPERTY</th>
<th>COMPARABLE #1</th>
<th>COMPARABLE #2</th>
<th>COMPARABLE #3</th>
</tr>
</thead>
<tbody>
<tr>
<td>FM 373, Muenster (1575 ft from wind turbine)</td>
<td>County Rd 411, Muenster</td>
<td>County Rd 417, Muenster</td>
<td>23 County Rd 300, Muenster</td>
<td></td>
</tr>
<tr>
<td>MLS #</td>
<td>13808029</td>
<td>13534504</td>
<td>14140791</td>
<td>13922843</td>
</tr>
<tr>
<td>Sale Price</td>
<td>$97,500</td>
<td>$70,000</td>
<td>$79,500</td>
<td>$115,500</td>
</tr>
<tr>
<td>Sale Price Per Acre</td>
<td>$6,500</td>
<td>$5,957.45</td>
<td>$6,191.59</td>
<td>$5,250</td>
</tr>
<tr>
<td>Sales or Financing Conditions</td>
<td>Conventional</td>
<td>Conventional</td>
<td>Cash</td>
<td>Conventional</td>
</tr>
<tr>
<td>Date of Sale</td>
<td>5/25/2018</td>
<td>10/18/2017</td>
<td>7/18/2019</td>
<td>3/18/2019</td>
</tr>
<tr>
<td>Land Type</td>
<td>Agricultural/ Residential</td>
<td>Agricultural/ Residential</td>
<td>Recreational</td>
<td>Agricultural/ Residential</td>
</tr>
<tr>
<td>Site Area (Acres)</td>
<td>15</td>
<td>11.75</td>
<td>12.84</td>
<td>22</td>
</tr>
<tr>
<td>Road</td>
<td>Farm to Market Road</td>
<td>County Road</td>
<td>County Road</td>
<td>County Road</td>
</tr>
<tr>
<td>Topography</td>
<td>Level</td>
<td>Rugged</td>
<td>Level to Steep</td>
<td>Level</td>
</tr>
<tr>
<td>Utilities</td>
<td>No Water, Septic Required</td>
<td>No Water, Septic Required</td>
<td>No Water, Septic Required</td>
<td>No Water, Septic Required</td>
</tr>
<tr>
<td>Improvements</td>
<td>None</td>
<td>None</td>
<td>None</td>
<td>None</td>
</tr>
</tbody>
</table>
The Subject Property (with view of wind turbines) sold at a higher price per acre than all of the comparable sales outside of the wind turbine study area.
## PAIRED SALE #2 – CR 477, MUIENSTER (570’ FEET FROM TURBINES)

<table>
<thead>
<tr>
<th>FEATURE</th>
<th>SUBJECT PROPERTY</th>
<th>COMPARABLE #1</th>
</tr>
</thead>
<tbody>
<tr>
<td>CR 477, Muenster (570 ft from wind turbine)</td>
<td>Hwy 82, Muenster</td>
<td></td>
</tr>
<tr>
<td>MLS #</td>
<td>11913363</td>
<td>12141614</td>
</tr>
<tr>
<td>Sale Price</td>
<td>$1,200,000</td>
<td>$721,440</td>
</tr>
<tr>
<td><strong>Sale Price Per Acre</strong></td>
<td><strong>$4,528.30</strong></td>
<td><strong>$3,510.66</strong></td>
</tr>
<tr>
<td>Sales or Financing Conditions</td>
<td>Cash</td>
<td>Cash</td>
</tr>
<tr>
<td>Date of Sale</td>
<td>9/3/2013</td>
<td>6/2/2014</td>
</tr>
<tr>
<td>Land Type</td>
<td>Agricultural/Recreational/Residential</td>
<td>Agricultural/Commercial/Residential</td>
</tr>
<tr>
<td>Site Area (Acres)</td>
<td>265</td>
<td>205.5</td>
</tr>
<tr>
<td>Road</td>
<td>Gravel County Road</td>
<td>Highway</td>
</tr>
<tr>
<td>Topography</td>
<td>Rolling, Varied</td>
<td>Rolling</td>
</tr>
<tr>
<td>Utilities</td>
<td>2 water wells and electric in place, septic required</td>
<td>Electric, no water, septic required</td>
</tr>
<tr>
<td>Improvements</td>
<td>None</td>
<td>None</td>
</tr>
</tbody>
</table>
Subject Property (less than 600 feet from wind turbines) sold at a higher price per acre than the comparable sale outside of the wind turbine study area.
The area north of Muenster has seen considerable wind turbine activity over the last decade.

We can compare the residential sales in the area during this time period to residential sales in Cooke County overall to see if there was any property value impact from the introduction of wind turbines to the area.
Consider the sales data from 2000 to today, overall residential property value trends in Muenster indicate that the presence of wind turbines has not negatively affected property values.

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Muenster compared to Cooke County overall</th>
</tr>
</thead>
<tbody>
<tr>
<td>Price per square foot</td>
<td>Similar or slightly higher (Oct 2019: $128 versus $110)</td>
</tr>
<tr>
<td>Days on market</td>
<td>Similar or slightly lower (Oct 2019: 61 versus 65)</td>
</tr>
<tr>
<td>Median sale price</td>
<td>Similar or slightly higher (Oct 2019: $207,500 versus $201,000)</td>
</tr>
<tr>
<td>Sale price to list price ratio (i.e. extent of “discount” on purchase)</td>
<td>Similar or slightly better (Oct 2019: 96.1% versus 94.7%)</td>
</tr>
</tbody>
</table>
**CASE STUDY: MUENSTER WIND TURBINES**

<table>
<thead>
<tr>
<th>Period</th>
<th>Sales Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>2000-2007</td>
<td>48 sales</td>
</tr>
<tr>
<td>2008-2018</td>
<td>122 sales</td>
</tr>
</tbody>
</table>


Average of 17.42 sales per year from 2008 onward.
CASE STUDY: MUENSTER WIND TURBINES

- A Case Study of Market Trends
- Purple area displays the area north of Muenster with wind turbines (Groce's study area)
- Data includes residential sales
- The first turbines were installed in 2008
- We study sales trends in this area over time - before, during, and after the turbines were installed
- The comparison of this area is made to both Era and its surrounding area, as well as Cooke County trends overall
MARKET ANALYSIS: GROCE’S STUDY AREA vs. COOKE COUNTY

Median Price per Square Foot of Living Area Residential Properties

- Both the study area and Cooke County overall have seen positive median price growth since 2013.
- The market data shows no sign of negative effects from the wind turbine activity.
Median Sale Price
Residential Properties

- Both the study area and Cooke County overall have seen median sale price increases since 2012.
- The market data shows no sign of negative effects from the wind turbine activity.
MARKET ANALYSIS: GROCE’S STUDY AREA vs. COOKE COUNTY

Average Days on Market Residential Properties

- Both the study area and Cooke County overall have seen minimal change with a recent decline in the number of days on market starting in 2015.
- The market data shows no sign of negative effects from the wind turbine activity.
Sale Price to List Ratio
Residential Properties

- The market data shows no sign of negative effects from the wind turbine activity.
MARKET ANALYSIS: GROCE’S STUDY AREA vs. COOKE COUNTY

Sales Volume Trends

- Both the study area and Cooke County overall have seen similar trends in the number of sales transactions, before and after the introduction of turbines.
- The market data shows no sign of negative effects from the wind turbine activity.
ADDITIONAL MARKET ANALYSIS: WIND TURBINE VS ERA (LAND PLOTS AND RESIDENTIAL)
The following two slides analyze the Muenster Study Area (with existing wind turbines) versus the development range proposed for Era.

- The figures on the right show all residential property sales less than 5 Acres (no land sales).
- The figures on the left show all property sales greater than 5 acres (residential and farm/ranch included).

While year-to-year changes are evident, due to relatively few sales in both areas, the real estate market trends between Era and Muenster (the “Study Area”) are similar over time.

- For residential properties in particular, the Study Area tends to sell for a higher price per square foot.
- For Farm/Ranch properties, the Study Area generally sells for a higher price per acre, and sells in roughly half the number of days as that of Era.
ADDITIONAL MARKET ANALYSIS: MUENSTER STUDY AREA VS ERA
The Following Three Slides Analyze the Muenster area in sight-line of the existing Turbines versus the development range proposed for Era.

- The figures on the right show all residential property sales less than 5 Acres (no land sales).
- The figures on the left show all land sales greater than 5 acres (vacant land only).

No observable trends appear to be correlated with wind farm activity.
ADDITIONAL MARKET ANALYSIS: WIND TURBINE VS ERA

Median Price Per Acre (Properties Greater than 5 Acres)


Median Price Per Sq. Ft. (Residential Less than 5 Acres)

ADDITIONAL MARKET ANALYSIS: MUENSTER STUDY AREA VS ERA
<table>
<thead>
<tr>
<th>Study</th>
<th>Location &amp; Focus</th>
<th>Methodology</th>
<th>Findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Atkinson-Palombo &amp; Hoen; 2014</td>
<td>Massachusetts-122k residential sales between 1998 and 2012</td>
<td>Hedonic model</td>
<td>No evidence of wind turbines affecting nearby home prices or lowering the rate of home sales near turbines or in any stage of development.</td>
</tr>
<tr>
<td>Hoen, Brown, Jackson, Thayer, Wiser and Cappers; 2014</td>
<td>Across the U.S., looking at the location of approximately 40,000 wind turbines</td>
<td>Ordinary least squares and spatial-process difference-in-difference hedonic models</td>
<td>No statistical evidence of home values near turbines affected in either the post-construction or post-announcement/pre-construction periods.</td>
</tr>
<tr>
<td>Vyn and McCullough; 2014</td>
<td>Ontario, Canada- rural residential and farmland sales</td>
<td>Hedonic model- proximity, visibility to the closest turbine and the interaction of the two variables</td>
<td>All variables for both rural residential and farmland were not statistically significant and in many cases variables were non-negative</td>
</tr>
<tr>
<td>Carter; 2011</td>
<td>Lee County, IL- rural residential</td>
<td>Hedonic model-1,298 transactions from 1998-2010</td>
<td>No statistically significant impact on nearby residential property values.</td>
</tr>
<tr>
<td>Hinman; 2010</td>
<td>McLean County, IL- rural residential</td>
<td>Pooled hedonic regression analysis</td>
<td>Lower prices when a wind farm was announced but once built proximity to an operating wind farm did not negatively influence values.</td>
</tr>
</tbody>
</table>
## LITERATURE: STATE AND LOCAL IMPACTS OF WIND TURBINES

<table>
<thead>
<tr>
<th>Study</th>
<th>Location &amp; Focus</th>
<th>Findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>De Silva, McComb, Schiller, 2016</td>
<td>Texas- looking at the effects of wind turbines to local economies—employment, income, tax revenue, etc.</td>
<td>“…For county governments, the increases in tax capacity appear to have resulted in <strong>decreases in county property tax rates</strong> while <strong>increasing total county property tax revenues</strong>. All county property tax payers can perceive a benefit from the reduction in property tax rates while all county residents enjoy any expansion or improvement in county services that might result from the increased general fund tax revenues.”</td>
</tr>
</tbody>
</table>
| Slattery, Lantz, Johnson, 2011 | Texas- Horse Hollow (Nolan & Taylor) and Capricorn Ridge (Sterling & Coke)       | Local economies (100 mile radius around projects):  
  - Received $730M in economic activity over 20 year life of project  
  - 225 jobs annually during construction  
  - 113 jobs annually operations and management |
Research has shown potential lower community support after announcement and before construction indicating a “fear of the unknown” stance.
- Laposa and Mueller 2010; Sunak and Madlener 2012, Heintzelman and Tuttle 2012, Hinman 2010

There is an increase in support after facilities began operation.
- Gipe 1995; Palmer 1997; Devine-Wright 2005; Wolsink 2007; Bond 2008; Bond 2010

Researchers have also found that survey respondents living closer to turbines support the turbines more than those living farther away.
- Braunholtz and Scotland 2003; Baxter et al. 2013
There is no evidence of negative effects to property values or communities due to the development or presence of wind turbines.

No evidence from:
- Groce’s sales
- Our paired sales analysis
- Market analysis
- Peer reviewed literature
President and Principal Consultant at Real Property Analytics, Inc.

General Certified Appraiser in Texas, along with other states

Specializes in analyzing the effects of environmental contamination, and other potentially adverse influences, on the market value of residential, commercial, industrial and agricultural properties

Has familiarity and experience with specialized valuation methods used in these types of assignments, including econometric and statistical modeling, paired sales analysis, and case study research

Has consulted on assignments and litigation matters throughout the United States and Canada

Has published articles in *The Appraisal Journal* and *The Journal of Real Estate Literature*