

Grundy Co, MO	30%	
Mecosta Co, MI	35%	dwellings only
Changed to	20%	total property (land and structures)
Midland Co, MI	20%	
DeWitt Co, IL	30%	rescinded
McLean Co, IL	35%	
DeKalb Co, AL	base reassessment, variable rates	
Renville Co, MN	base reassessment, variable rates	dwellings only
Humbolt Co, IA	20-40%	dwellings only--now rescinded
Frederick Co, MD	10%	now reduced to 5%
Muhlenberg Co, KY	18%	dwellings only

Dr. William J. Weida of Colorado College performed an extensive study of the economic and financial impact of CAOs. While his study principally focused on the diminished economic growth rates in communities surrounding CAOs, he also noted the substantial decreases in property values in those areas, as evidenced by property tax reductions. (See Table 1)

Illinois State Study⁵⁶

Complimentary to Professor Weida’s study, Miguel Gomez and Liying Zhang of Illinois State University conducted a comprehensive study of the impact of CAOs on rural economies, and found that CAOs are the cause of “...disruption of local social and economic systems, pollution problems resulting from intensive agriculture, and negative impacts on the quality of life in rural communities.”

***Gabrojolek farm, Dunnville, Ont.*⁵⁷**

Four large hog CAOs have been developed near the Gabrojolek’s family farm – one about 200 meters distance, one about 400 meters, and two about a kilometer away. Each facility houses 2,500 – 3,000 animals. The family has been forced to install central air conditioning and air purification systems, but still suffer from the effects of noxious odors. Untreated manure is being dumped near their home, bringing with it swarms of flies.

Central Industries Inc. – Central, Mississippi

Central Industries Inc. operated a large-scale poultry rendering plant near Central, Mississippi. As part of the process large quantities of poultry processing byproducts, which are highly susceptible to bacterial contamination were brought to this facility for further processing. The plant had been subject to a number of flooding events where the holding ponds were allowed to overflow into nearby creeks spreading bacteria laced poultry byproducts into nearby creeks and rivers. Poultry byproducts were discovered in trees, low density livestock areas, crop fields, and personal residences up to 50 miles away from the rendering plant. Greenfield Advisors inspected several homes and interviewed owners from which it was discovered that a significant disruption in property values and the ability to sell these properties occurred after and as the result of the Central Industries Inc. actions.

Livingston v Jefferson Board of Equalization⁵⁸

⁵⁶ Gomez, Miguel, and Liying Zhang, “Impacts of Concentration in Hog Production on Economic Growth in Rural Illinois”, Illinois State U. working paper presented to the American Agricultural Economics Association, July, 2000.

⁵⁷ Dines, Henderson, and Rock, op. cit.

⁵⁸ Aiken, J. David “Property Valuation May be Reduced by Proximity of Livestock Operation” Cornhusker Economics, Department of Agricultural Economics University of Nebraska – Lincoln May 2002

In 2002, the Nebraska Court of Appeals ruled that county board of equalization erred in not considering a rural residence's proximity to a swine facility in determining the residence's valuation. The owner of the facility, which contained 5,200 sows, also built a house $\frac{3}{4}$ of a mile away. He had further obtained an easement to spray the hog manure on the cropland across the road from his house. The court ordered the county to ignore the fact that the swine were also the property of the owner. The court cited Nebraska livestock nuisance decisions which show that hog odors would influence the home's value. Upon the ruling the county accepted a determination by a local, independent appraiser that the value was diminished 30%.

Craven County, North Carolina Study⁵⁹

This study utilized GIS and a hedonic price model similar to the Herriges et. al study and Ready et. al to evaluate the effect of swine concentration and proximity of those operations on residential property values. It was determined that for a farm with 5,000 animals 1 mile away had a statistically significant impact on home values.

Iowa State University Study⁶⁰

Similar to the Berks County study this study attempts to expand upon the work done in the Univ. of Minnesota & University of Mississippi studies. The variables used to quantify the effects in this hedonic analysis included proximity, size, and direction of nearest facility. Direction from site was included to determine the effect of being downwind and the odor & pest issues associated. Results from this study determined that a moderate size facility (250,000 live weight) has an impact up to 6% within 1 $\frac{1}{2}$ miles and 26% within a $\frac{1}{4}$ mile.

Berks County, Pennsylvania Study⁶¹

Ready and Abdulla (2005), of Penn State's Agricultural and Environmental Economics Department expand upon the hedonic analyses of others and reviewed the amenity and disamenity impacts of agriculture including different types of open space (publicly owned, eased, vacant, pasture/crops), landfills, airports, mushroom production, and AFOs. The study determined that "...only landfills have a worse effect on adjacent property values." Further, "...a sewage treatment plant has less depressing effects on nearby housing prices than a factory farm operation..." according to their findings. The study found that the clustering of AFOs within a certain area is the controlling factor not the nearest operation when considering proximity. A threshold impacts of 4.1% from AFOs within 800m, and at least 6.4% from within 500m, both of which were half of a landfill's. The study also reviewed the effects of size, species, and environmental stewardship (registration of waste management plans). Their findings were presented at the Sustainable Hog Farming Summit in Gettysburg, PA, in June, 2003.

Summary of CAO Empirical Findings

The establishment of a CAO results in value diminution to other nearby properties both through a negative externality as well as through indirect economic impacts. The amount of the value loss is an

⁵⁹ Milla, Katherine, Michael H. Thomas, Winsbert Ansine "Evaluating the Effect of Proximity to Hog Farms on Residential Property Values: A GIS-Based Hedonic Price Model Approach" URISA Journal Vol. 17, No. 1 2005 Pg. 27 – 32

⁶⁰ Herriges, Joseph A, Silvia Secchi, and Bruce A. Babcock "Living with Hogs in Iowa: The impact of Livestock Facilities on Rural residential Property Values" Working Paper, Iowa State University Center for Agricultural and Rural Development (August 2003)

⁶¹ Ready, Richard & Charles Abdalla "The Impact of Open Space and potential Local Disamenities on Residential Property Values in Berks County, Pennsylvania" American Journal of Agricultural Economics 87 May 2005 p. 314-326

inverse function of distance (closer properties diminish more), a function of property type (newer, nicer residences lose more) and a function of property use (farms will lose due to diminished productivity and comparative marketability to other farm lands while residential use will no longer be a highest-and-best use). While the appraisal profession has only begun to quantify the loss attributable to CAOs, it is clear from the broad array of empirical studies and case studies that diminished marketability, loss of use and enjoyment, and loss of exclusivity results in a diminishment which can range from 50% to nearly 90% of otherwise unimpaired value for homes which are adjacent to the facility. Negative impacts are noted at distances exceeding 3 miles, and in the case of a flood or other weather event, waste from the facility can be spread over far greater areas.

Table 2
Summary of CAO Impacts

<u>Case Study</u>	<u>Value Loss</u>	<u>Remarks</u>
Minnesota	N/A	Significant diminution in air quality
North Carolina	N/A	Established distance component to value
U. Minnesota	N/A	CAO sited near older, less-expensive homes
Central, MS	N/A	Marketability substantially diminished
Colorado St. Study	5% - 40%	Losses confirmed by tax assessors in 8 states
<i>Dalkeith, Ontario</i>	> 50%	Severe loss of marketability
Missouri	Residential 3 miles: 6.6%	
	Residential 0.1 mile: 83%	
Washington	Family farm adjacent: 50%	Impact included flies & loss of farm income
Michigan Farm	Farm adjacent: 50%	Impact included loss of use as a farm
Michigan Res.	Residence adj.: 60-100%	Residence abandoned, could not be sold
Livingston	Residence @ ¼ mile: 30%	
Craven, NC	N/A	Statistically significant at one mile
Berks, PA	Residence ¼ mile: < 6.4%	
	Residence ½ mile: 4.1%	
Iowa St. Study	Residence ¼ mile: 26%	
	Residence 1.5 miles: 6%	

Since the initial review of CAOs affect on proximate property values, multiple new trends have been identified. First, the increased use of GIS in local governments has provided researchers with the ability to conduct investigations that are more thorough. Providing researchers with more data, in abundance and in detail, allows them to better locate which factors and to what degree are having an affect. Second, in conjunction with more data and use of GIS an improvement in the hedonic analyses performed. The Berks County study noted that previous studies such as the, University of Minnesota study and the North Carolina study, were conducted on less than 300 sales transactions each, but that the Berks County study and the Iowa State studies reviewed 8,090 and 1,145 transactions respectively. While more data does not imply more significant results it does allow researchers to be more discriminating when compiling their datasets.

Second, because of the increased use of GIS and the results from the hedonic analysis that were found in the new case studies it was shown that a CAOs basic impact is related to proximity and size, but that other factors such as the operations waste management practices can alter that impact higher or lower. Overall, the new studies confirm the valuation impacts from the previously cited studies as they ranged from 3.1% to 26% loss depending on multiple factors. More importantly however was the discussion on the impact of other site-specific factors that were considered as part the hedonic analyses. The Berks County Study showed at 800 meters, an operation with a waste management plan diminished a house's value 1.1%, while an operation without would diminish the value 4.2%. Also related to this was the

affect that operation size has. Both the Berks County study and Iowa State study showed that a larger facility in close proximity would not necessarily decrease the value of a more than a smaller facility. Both of the studies concluded that this effect could be attributed to un-modeled characteristics such as waste management practices and other site-specific attributes.

Review of the Jacobson Appraisal

Both this review and the Jacobson appraisal were performed for (the “client”), and other intended users include those involved in his property tax appeal as well as other parties to negotiations or litigation arising out of this matter. I have not developed my own opinion of value concerning the property, but rather am simply opining on the methodology followed by Mr. Jacobson. The Jacobson appraisal was dated March 11, 2009, and is effective as of that date. There are no unusual assumptions or hypothetical conditions evidenced in the Jacobson report.

To summarize, the property is a 1½ story, 2,602 square foot, single family home, built in 1977, on a 0.63 acre site. The site is zoned AG-1 (agricultural), and according to the appraisal, neither the property nor the neighborhood evidence any unusual factors except for the proximate location of a hog feeding operation. My review will be limited to the manner in which Jacobson deals with that negative externality.

The Jacobson appraisal and report thereof treat the negative externality in two different, but consistent ways:

1. As external obsolescence in the cost approach
2. As a location adjustment in the sales comparison approach.

Both of these methods are widely accepted, and certainly meet the appraisal standards requirements. Further, Jacobson derives his adjustments through a set of “matched pairs”, where he compares the sales prices of two properties which are also proximate to CAO with the “unimpaired” appraised values of those properties. Again, Jacobson uses a well-accepted method for deriving his adjustment.

Jacobson derives a negative adjustment of 30%, which is certainly consistent with the appraisal literature, with our studies in this field, and with what other appraisers would be expected to find.

Certification of this Review

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 our personal, impartial, and unbiased professional analyses, opinions, and conclusions.
- Neither Greenfield Advisors nor I have a present or prospective interest in the property that is the subject of the work under review and no (or the specified) 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 is not contingent on an action or event resulting from the analyses, opinions, or conclusions in this report or from its use.
- My compensation for completing this assignment is not contingent upon the development or reporting of predetermined assignment results or assignment results that favors the cause of the client, the attainment of a stipulated result, or the occurrence of a subsequent event directly related to the intended use of this appraisal review.
- The reported analyses, opinions, and conclusions were developed and this report was prepared in conformity with the Uniform Standards of Professional Appraisal Practice.
- I have made not an inspection of the property that is the subject of this report.
- No one provided significant professional assistance in the conduct of this appraisal.
- This assignment has been performed and this report developed in compliance with the Code of Professional Ethics and Standards of Professional Appraisal Practice of the Appraisal Institute.
- The Appraisal Institute retains the right to review this report.

Sincerely,

GREENFIELD ADVISORS LLC



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