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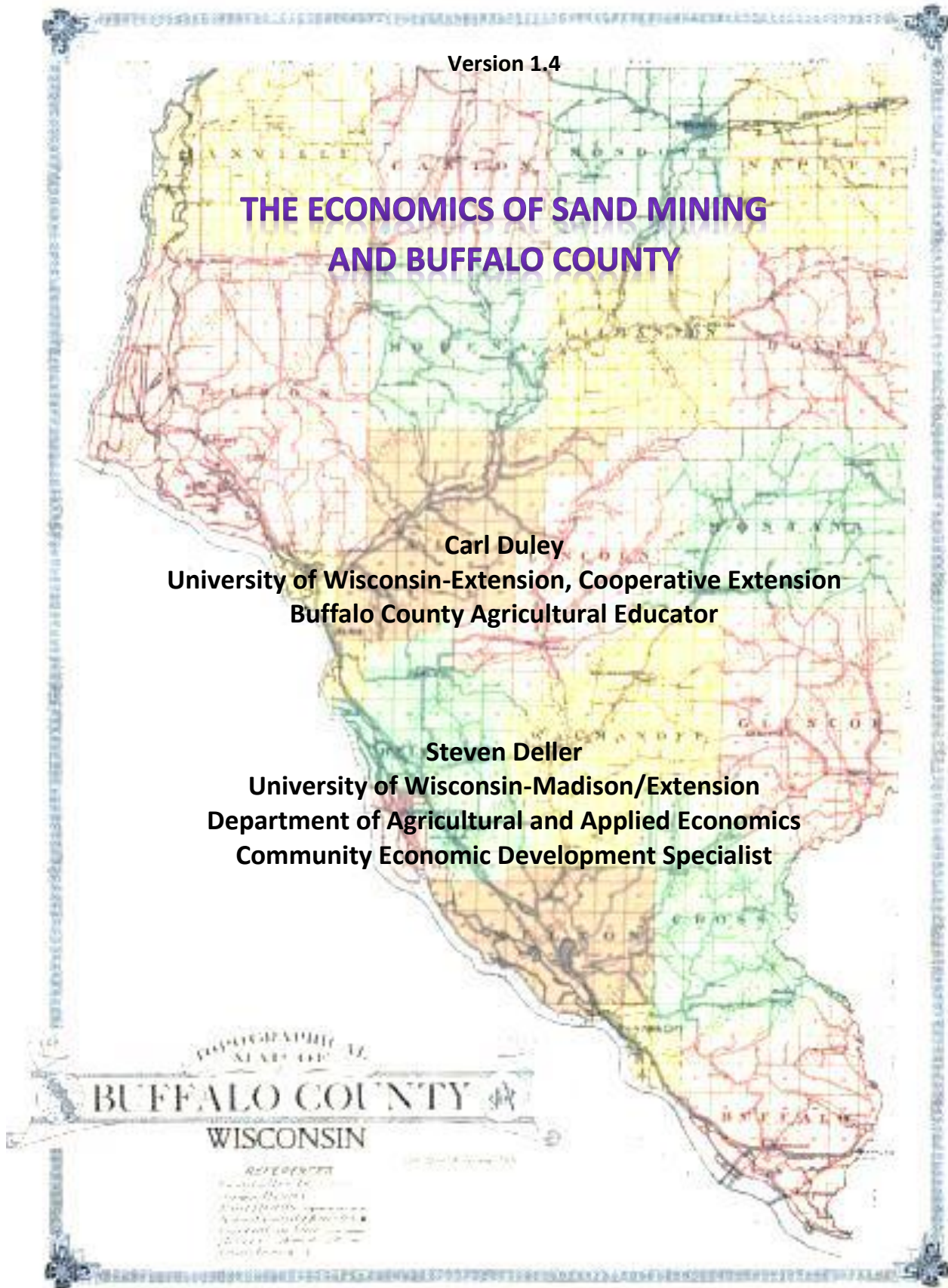
# **THE ECONOMICS OF SAND MINING AND BUFFALO COUNTY**

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## THE ECONOMICS OF SAND MINING AND BUFFALO COUNTY

### Study Overview

Domestic sources of petroleum products that were cost prohibitive prior to the significant increases in the world price for petroleum are today being profitably utilized. Today, the process of hydraulic fracturing, or “fracking”, to remove oil and gas from rock formations has created “mining booms” in large parts of the western Appalachian Mountains (the Marcellus fields in the Appalachian Basin) and western North Dakota and eastern Montana (the Bakken fields in the Williston Basin). The engineering of the extraction process requires sand with specific characteristics that is in abundant supply in many parts of Wisconsin. The surge in demand for this “frac sand” has created what appear to be significant economic opportunities for the western and central parts of Wisconsin.

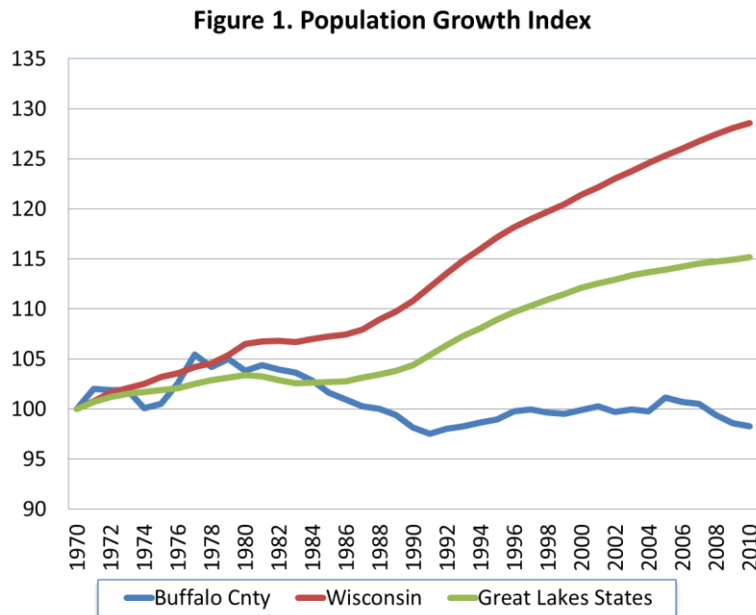
This economic opportunity is in the process of playing itself out in Buffalo County. Unfortunately, there is significant controversy around this opportunity. On the one hand, the mining industry has the potential for the creation of a number of well-paying jobs as well as significant financial windfalls to land owners. On the other hand, Buffalo County can be characterized as a high natural amenity area that attracts residents as well as a strong farming economy. In recent land use planning surveys, more than 96 percent of resident and non-resident landowners indicate that they wanted to preserve the agricultural land and the natural beauty of the county. The challenge is to create the conditions where mining opportunities can be pursued but not at the expense of environmental quality and the farming community.

To help allow time for the communities of Buffalo County to consider all the issues and put into place informed policies, the County Board approved a seven-month moratorium on frac sand mines effective the end of March, 2012. To aid in these discussions the County Board requested that the University of Wisconsin-Cooperative Extension undertake a study of the economics of the mining industry in Buffalo County. This report summarizes the results of that undertaking.

The report is composed of five sections. To begin, we provide an overview of the Buffalo County economy with attention to current economic strengths and weaknesses. We then review the findings of current research on the economics of mining and how it may or may not impact local communities. We pay particular attention to strategies that can minimize the negative impacts and maximize the positive. In the third section we outline the results of four “what-if” economic impact scenarios. This allows for a comparison of the potential economic impacts of the promotion of frac sand mining within Buffalo County. We close the report with a broad summary of key findings and rely on an executive summary to highlight these findings in more detail.

## The Buffalo County Economy

One of the primary motivations for the acceptance of frac sand mines in Buffalo County is the perceived positive economic opportunities that will be created. To better understand this potential it is important to understand where the Buffalo County economy is today. This requires an examination of historical patterns and future directions. We look at three sets of data: (1) general demographics in particular population, (2) patterns of income, and (3) sources of employment.



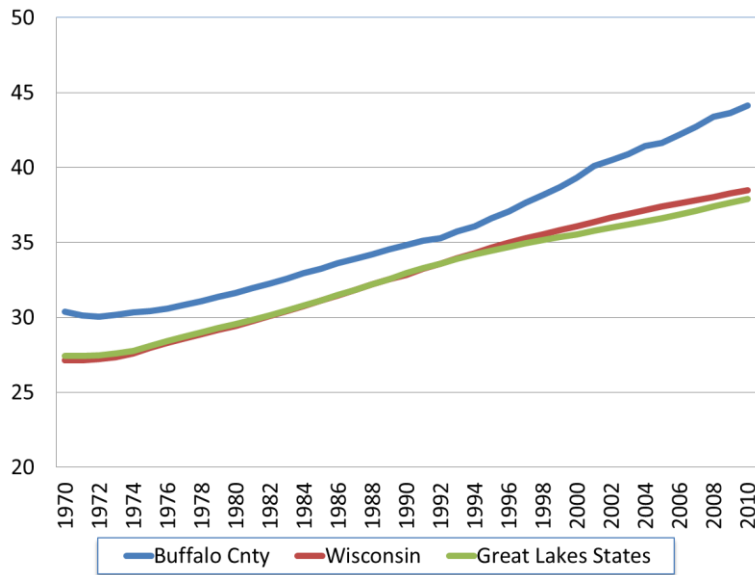
As outlined in Figure 1, the growth rate of population in Buffalo County is weak and lags behind Wisconsin and the larger Great Lakes States region. Generally considered the simplest metric of economic growth, stagnant or declining population is generally considered a strong indicator of a weak economy. While the downward trend of the 1980s was weakly reversed from 1991 to 2006 and was slightly above its level in 1970, the beginning of the study period, the County has tended to lose population since 2006. On face

value, stagnant and declining population is generally a strong trigger for the active promotion of economic growth. Here the prospect of creating economic opportunities through frac mining operations makes sense.

On the other hand, through a series of community meetings in support of this project, many residents expressed preferences for a slow growth projector. One participant stated that “this is a small, sleepy little county and we like it that way”. This mindset, while a reflection of the opinions of many Buffalo County residents, however, can create barriers to economic opportunities for other residents. Although this applied research project was not intended to create a “vision” for the County, it became clear through the community meetings there is conflict over the long-term vision of the region.

Not only is the County’s population growth stagnant and indeed declining, the typical resident of the County is getting older (Figure 2). In 1970 the median age was slightly over 30 years which was not quite three years older than the median average age for Wisconsin and/or the Great Lake States. But the U.S. as a whole is aging and Buffalo County reflects that trend. In 2010, the median age for Wisconsin was 38.5 years but for Buffalo County the median age is just over 44 years. In essence, not only is Buffalo County aging, it is aging at a faster rate than either Wisconsin or the Great Lake States. This aging is driven by three concurrent factors. First, as a society we are living much longer. In 1970

**Figure 2. Median Age**



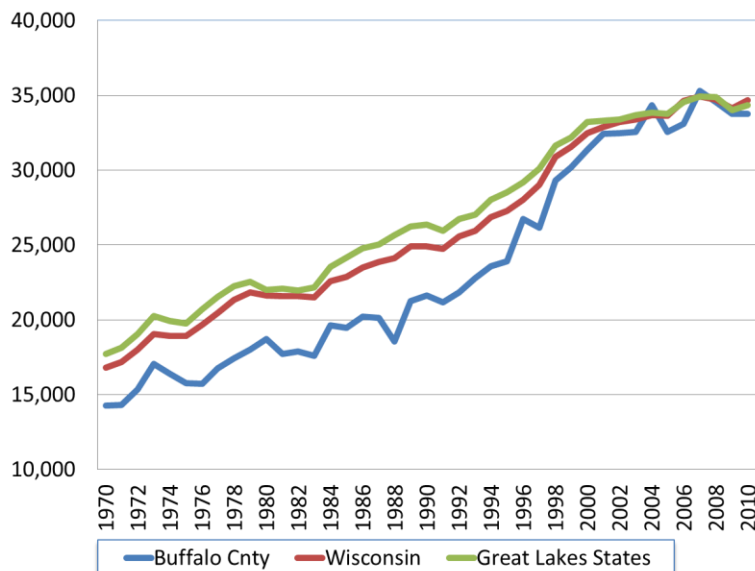
14 percent of the population was 65 years of age or older but by 2010 it had increased to 18 percent. Second, the birth rate in the U.S. has declined significantly: in 1970, there were 18.4 births per 1,000 population, but by 2009 the rate had declined to 13.8. While there were variations in the decline over the past 40 years, such as an increase in 1990-1991, the overall downward decline has been consistent. Third, communities in Buffalo County, especially along the Mississippi River and other areas with high levels of natural

amenities, have seen an increase in retirees moving into the community on a fulltime or seasonal basis.

This aging population relative to the potential for mining operations raises the question, who will take the jobs? If the population is aging and a larger share of the population is over the age of 65, this has significant implication on the “supply of labor” that might be available for hire by the mines. This is an important question that will be addressed in more detail below.

The growth of per capita income has been strong for Buffalo County (Figure 3). In 1970, Buffalo County per capita income, adjusted to 2005 dollars to remove the effects of inflation, was \$14,260

**Figure 3. Per Capita Income (Real 2005\$)**



which was below the Wisconsin average (\$16,800) as well as the Great Lakes States (\$17,700). Despite the growth in “real” per capita income (i.e., adjusted for inflation) for the County the gap remained until about 1995. From 1995 to about 2004 per capita income for the County grew at a much faster rate than either Wisconsin or the Great Lake States. Indeed, in 2004 as well as 2006 per capita income in Buffalo County was above both Wisconsin and the Great Lake States. In 2010, the

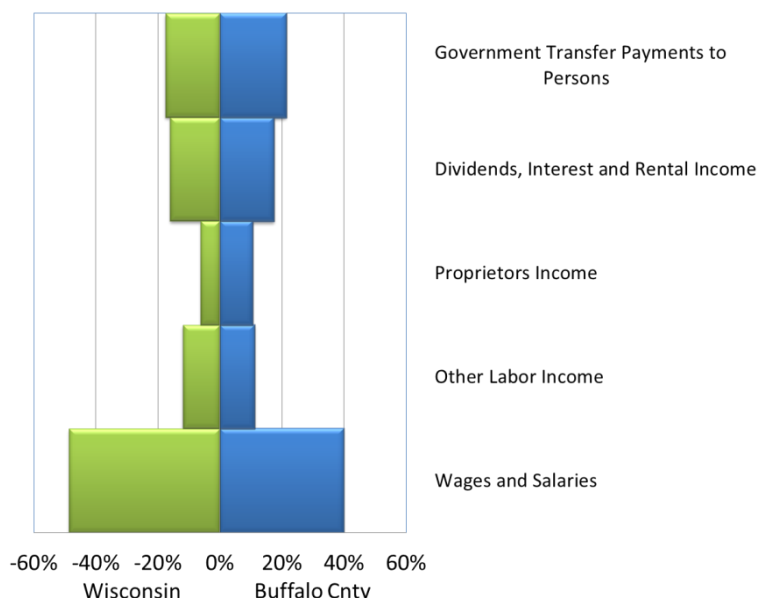
most current year of data per capita income was \$33,800 for the County compared to \$34,700 for Wisconsin and \$34,400 for the Great Lake States. In the examination of employment trends below and insights gained from the community meetings, this growth can be attributed to growth in the trucking industry as well as growth in manufacturing within the County.

Income comes from many sources, both related to work, such as wages and salaries along with proprietors' income, as well as passive, such as transfer payments to individuals

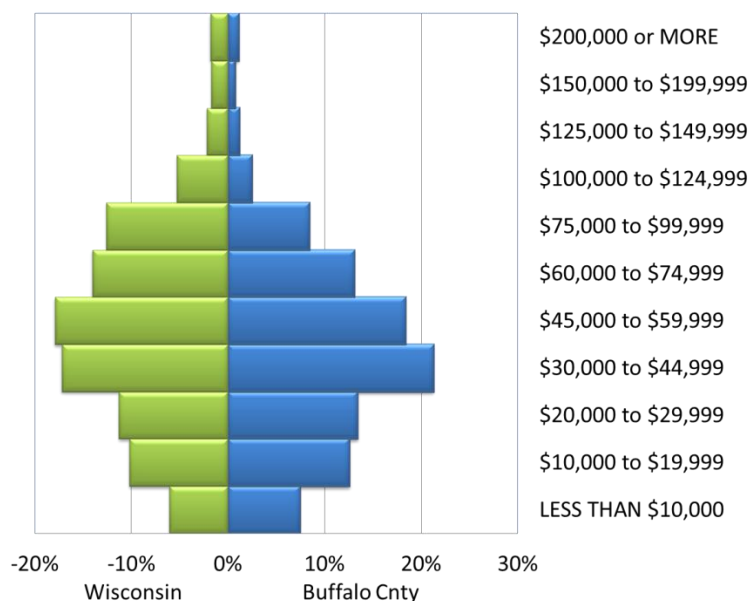
such as social security and unemployment benefits as well as dividends and interest on investments and savings. 2010 wages and salary for Buffalo County accounted for about 40 percent of total income, which is smaller than the average for Wisconsin which is 48.5 percent (Figure 4). Rather, Buffalo County is much more dependent on passive sources of income such as transfer payments to individuals. This latter result is a reflection of the larger share of persons over age 65 that are likely drawing social security payments.

If we examine how these sources of income change over time one can see clear patterns of cycles in financial markets (i.e., dividends and interest income) as well as employment cycles (i.e., wages and

**Figure 4. Sources of Income 2010**



**Figure 5. Household Income Distribution 2010**



transfer payments). For example, during the Great Recession there was a noticeable decline in wage and salary income as well as dividend, interest and rental income, but a large increase in transfer payments in the form of unemployment insurance payments.

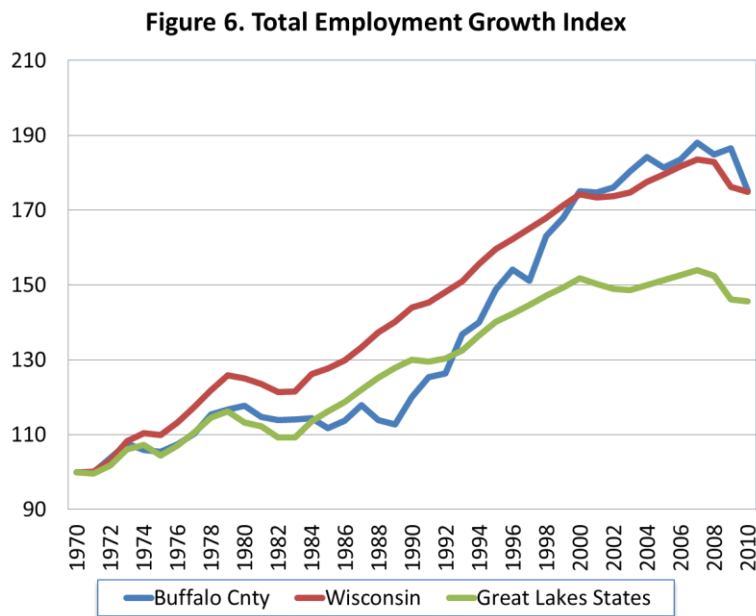
Despite per capita income for Buffalo County being on par with Wisconsin (Figure 3), the distribution of household income is "tighter" around the average than Wisconsin (Figure 5). Most households in the County have



income levels between \$30,000 and \$44,999 whereas for Wisconsin most households have income between \$45,000 and \$59,999. There are also fewer households in Buffalo County that have incomes above \$100,000 when compared to Wisconsin. These differences can be explained in three ways. First, as we will discuss in detail below, average salary and wages per job tend to be a little below the state average. Second, the higher dependency on transfer payments, including social security payments, for the County dictates that household incomes will be slightly lower. Third, although we lack reliable cost of living data, house values along with rents which tend to drive cost of living, are apt to be lower in Buffalo County than Wisconsin.

While a brief examination of population, age profiles and income is important to understand the context of the discussions around the economics of frac sand mining and Buffalo County, the debate has hinged on the job generating potential of the proposed mines. This is understandable because of the slow recovery of employment from the Great Recession and the tendency to focus economic growth discussions around jobs. Thus, it is important to understand trends in employment and the

wages/salaries associated with those jobs.

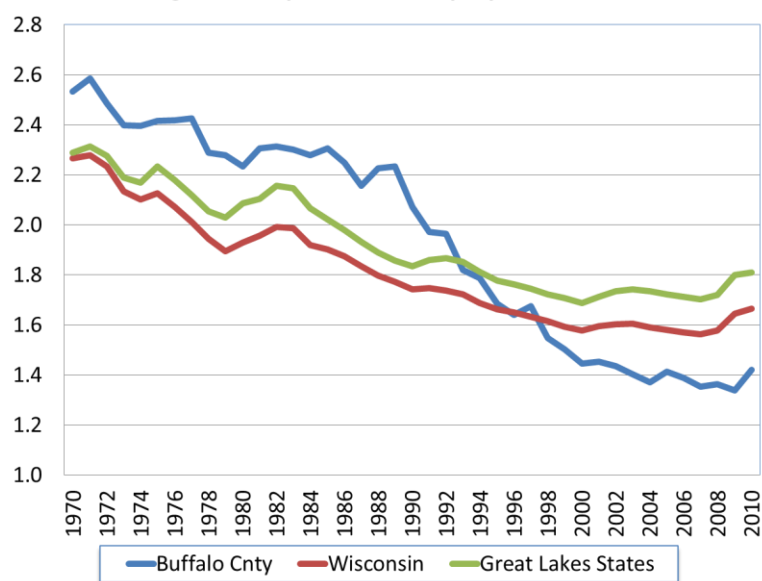


Despite the stagnation in population growth (Figure 1), Buffalo County has experience strong growth in employment (Figure 6). Prior to the Great Recession, employment grew by nearly 90 from 1970 with much of the growth occurring between 1989 and 2006. Over the past ten years employment growth in Buffalo County has paralleled Wisconsin with the decline in employment of the Great Recession of 2008-2010 particularly evident. Compared to the Great Lake States, employment

growth in Buffalo County has been very robust.

If we combine the population (Figure 1) and employment (Figure 6) a very important pattern becomes readily apparent. Looking at a simple ratio of population to jobs (Figure 7) we see that in 1970 there were about 2.5 people for every job in Buffalo County compared to about 2.3 for both Wisconsin and the Great Lake States. But by 2010 there were 1.3 persons for every job in the County, far below either Wisconsin (1.7 persons per job) or the Great Lake States (1.8). Several reasons have been advanced for why there has been such a remarkable decline in the population – employment ratio including the strong growth in the number of part-time jobs and the increase in the labor force participation rate for women, particularly during the 1970s and 1980s.

**Figure 7. Population -- Employment Ratio**



This significant decline in the population – employment ratio for Buffalo County raises a serious question if a significant number of frac sand mines and/or sand processing plants are approved: *who will take the jobs?* There are several potential pools of labor: (1) new entrants into the labor force, (2) in-migrants moving into the County, or (3) shifts in commuting patterns where Buffalo County residents who commuted out of the County for work remain in the County or people living outside the County commute in to take the

jobs. Given the labor force participation rate for persons between the age of 18 and 65 in 2010 is 83.9 percent for the County, which compares to 81.4 percent for Wisconsin, *it appears unlikely that potential workers will come from increased labor force participation rates.* This conclusion is supported by the relatively higher age structure (Figure 2) of County residents.

This means that the more likely scenario addressing the *question who will take the jobs* is in-migration of new residents and/or changes in commuting patterns. Consider commuting patterns for people who live in Buffalo County. Unfortunately, the commuting data from the 2010 Census are unavailable and we are limited to 2000 Census data. In 2000, 48.4 percent of Buffalo County residents who work have employment in Buffalo County itself, but 3,678 people commuted out of the County with 19.9 percent commuting to Winona County, Minnesota, 7.7 percent to Eau Claire County, 4.4 percent to Wabasha County, Minnesota and 4.3 percent to Pepin County. At the same time, there are only 946 people commuting into Buffalo County for work. While it is possible that the opening of sand mining operations may see a shift in commuting patterns with some Buffalo County residents electing to stop commuting out of the County to take jobs at the mining operations, we do not know the occupations of those who are commuting. For example, it is unlikely that a person in the health care industry (e.g., a nurse) who commutes out of the County for employment is likely to shift occupations to take a mining related job in the County. Based on the research reviewed below, it is likely that jobs will be taken by employees commuting into the county but not moving to Buffalo County.

The third source of workers is in-migrants who move into the County. There is significant academic research on the basic question of *who takes the jobs* when significant employment opportunities become available in smaller more rural communities. The research suggests that for better paying jobs, in the long-term the majority of jobs are taken by in-migrants, or people moving into the community. Much of this research, unfortunately, examines the opening of large manufacturing or service providing industries. There is limited work on mining and what is available tends to focus on

large mining operations that tend to open in more remote rural areas. Because of the remoteness of many of these mines, nearly all the jobs that are created are filled by workers moving into the area. In addition, many of the trucking services, the primary source of jobs associated with sand mining, could be contracted from any number of businesses outside the County. Thus, one might expect that most of the jobs will be taken by people moving into Buffalo County. But, as discussed in more detail below, there is some evidence that might challenge this conclusion.

### **Strengths and Weaknesses of the Buffalo County Economy**

One of the challenges in trying to understand the Buffalo County economy is to identify the strengths and weaknesses of the economy. While there are numerous ways to approach this question, a popular approach is to examine patterns in Location Quotients over time. A Location Quotient (LQ) is

**Figure 8. Simply Cluster Identification Method**



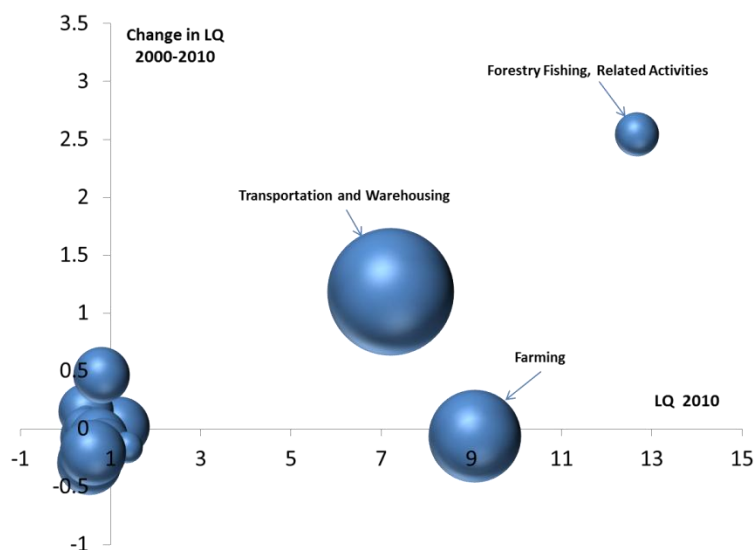
a simple indicator centered on one: a LQ that is greater than one for any given industry indicates a relative strength or specialization whereas a LQ less than one indicates a weakness or lack of specialization. By tracing how the LQ for individual industries change over time we can track the relative strengths and weaknesses of the County economy.

As outlined in Figure 8 there are four possible combinations. First, where the LQ is greater than one and growing over time is considered a “strength and growing” industry. This would be in the upper right

hand quadrant of Figure 8. Some have suggested that industries that fall into this category might be “clusters” or industries that could be the backbone of the local economy. Second, the LQ is greater than one, indicating a strength, but is declining in value over time. This would industries located in the lower right hand quadrant of Figure 8. These industries might represent a potential threat to the local economy: the industry is historically a strength but is weakening over time. These industries represent a threat because people are familiar with or comfortable with the industry and maybe resistant to change. The third potential combination would be industries where the LQ is less than one, a sign of weaknesses, but the LQ is growing over time. These industries would be in the upper left hand quadrant of Figure 8. The growth in the LQ is an indicator that this industry might be an opportunity for the local economy. The final combination is the lower left hand quadrant where the LQ is less than one and is declining in value. Industries that are in this quadrant are considered a weakness and declining.



**Figure 9. Cluster Analysis for Buffalo County**



There is a third element of this simple analysis, the relative size of the industry. It is possible to have an industry that is a strength and growing (i.e., in the upper right hand quadrant of Figure 8) but is sufficiently small in terms of employment that its potential impact on the overall economy is modest. For example, in a recent study of agriculture and the Wisconsin economy Deller and Williams (2009)<sup>1</sup> found that Wisconsin is a national leader in animal production for fur (very

large and growing LQ), but the industry accounted for 0.01 percent of total Wisconsin employment. While this industry “fits” the notion of a potential cluster industry, the impact of the industry on the overall economy is relatively modest.

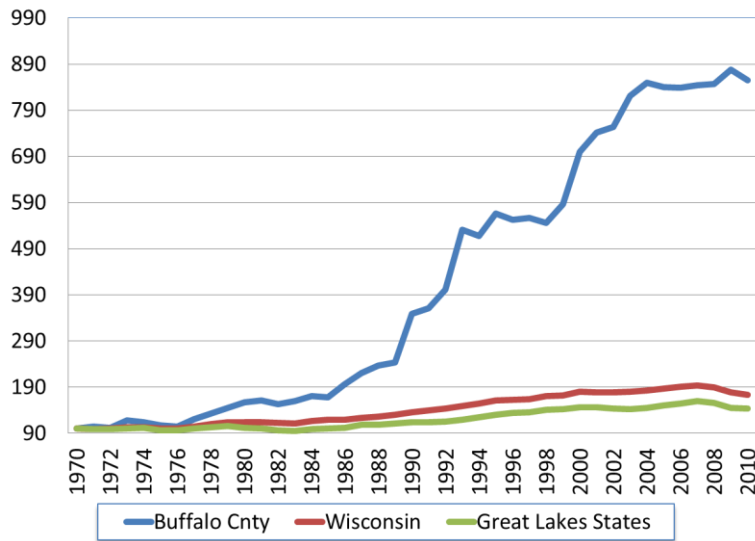
We conducted a simple analysis of Buffalo County using employment data from 2000 and 2010 and provide the results in Figure 9 as well as Table 1. In Figure 9, the size of the “bubble” reflects the share of total employment within the County. A larger bubble indicates a larger industry in terms of employment. Three industries are identified as “strength and growing” and might be considered a potential economic cluster for the County: transportation and warehousing, construction, and forestry and fishing related industries. Farming is a strength in terms of the Location Quotient, but the value of the LQ has basically not changed over the ten

**Table 1. Buffalo Cnty Simple Cluster Analysis**

	LQ	Change LQ	Share
<b>Farm</b>	<b>9.071</b>	<b>-0.067</b>	<b>13.0%</b>
<b>Forestry Fishing, Related Activities</b>	<b>12.665</b>	<b>2.542</b>	<b>3.0%</b>
Mining	0.491	0.048	0.2%
Utilities	0.931	0.003	0.3%
<b>Construction</b>	<b>1.192</b>	<b>0.017</b>	<b>5.5%</b>
Manufacturing	0.446	0.151	4.6%
Wholesale	0.687	-0.097	2.6%
Retail	0.558	-0.074	5.8%
<b>Transportation and Warehousing</b>	<b>7.205</b>	<b>1.182</b>	<b>24.6%</b>
Information	0.443	0.111	0.7%
Finance and Insurance	0.608	-0.018	3.3%
Real Estate, Rental and Leasing	0.744	-0.072	2.8%
Professional and Technical Services	0.424	0.006	2.6%
Management of Companies	0.000	0.000	0.0%
<b>Administrative and Waste Management</b>	<b>0.794</b>	<b>0.463</b>	<b>4.8%</b>
Educational Services	0.182	-0.199	0.4%
Health Care and Social Services	0.531	-0.292	6.3%
Arts, Entertainment and Recreation	0.768	0.030	1.5%
Accommodations and Food Services	0.729	-0.081	5.2%
Other Services except Public Administration	0.836	-0.147	4.6%
Federal Civilian Government	1.357	-0.162	1.5%
Federal Military	0.669	-0.152	0.4%
State/Local Government	0.604	-0.207	6.6%

<sup>1</sup> Steven C. Deller and David Williams. (2009). *The Contribution of Agriculture to the Wisconsin Economy*. Department of Agricultural and Applied Economics Staff Paper 541, University of Wisconsin-Madison. <http://www.aae.wisc.edu/pubs/sps/pdf/stpap541.pdf>

**Figure 10. Transportation and Warehousing Employment Growth Index**



year study period.

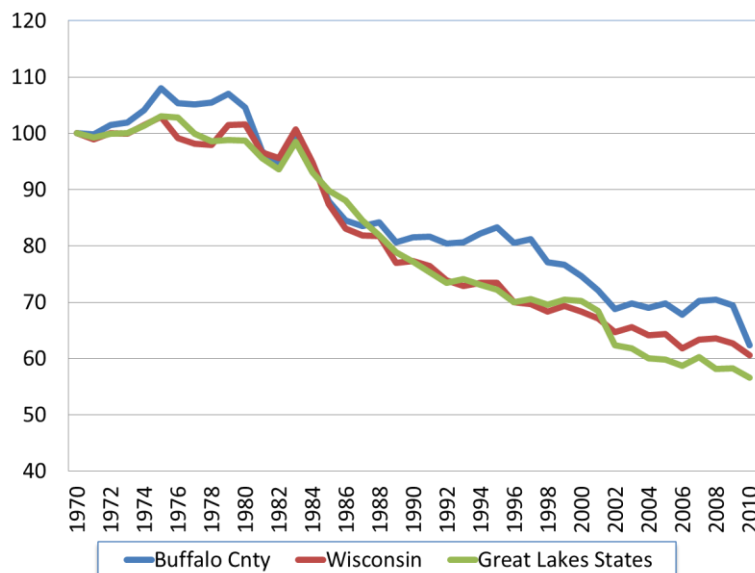
Consider transportation and warehousing which has a LQ in 2010 of 7.205 and has increased by a value of 1.182 since 2000. In 2010, this particular industry accounted for almost one in four jobs in the County. As outlined in Figure 10, there has been tremendous growth in this industry in the County with almost an 800 percent increase in employment over the past 20 years. This growth has been driven by Marten Trucking located in Mondovi.

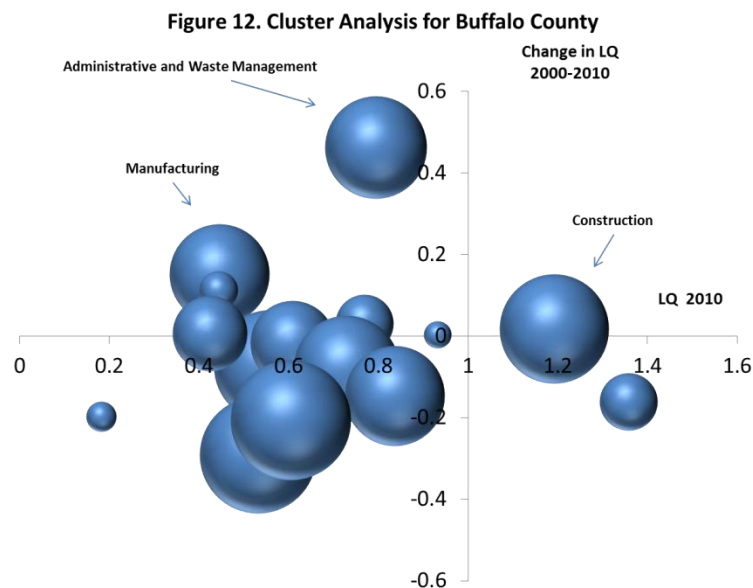
Although farming has not seen an increase in the relative strength as measured by the change in the LQ from 2000 to 2010, the relative large LQ in 2010 (9.071) coupled with farming accounting for 13 percent of employment in 2010, a closer examination of farming is warranted. Consider the growth in farm employment from 1970 to 2010 (Figure 11). For Buffalo County, Wisconsin, and the Great Lake States, farm employment has been steadily declining. At the same time, the number of farm operations in Buffalo County has been increasing, from 1,151 in 1997 to 1,229 farms in 2007. But the average farm size has decreased from 281 acres in 1997 to 250 acres in 2007. In essence, there are more farms that are smaller in scale and employing fewer people. It is likely Buffalo County has smaller farms with an increasing number renting their land, (still considered farms as rented land is farm income) to larger cash crop and livestock farms. Modern cash crop and livestock farms can

utilize many more acres per person than our smaller traditional dairy farms did.

These trends in Buffalo County's agricultural economy have important implications for the development of sand mining in the County. Many of the proposed mines are currently located on operating farms and the removal of farm land from production will place continued downward pressure on agriculture. The challenge is if a viable agricultural economy can be comparable with

**Figure 11. Farm Employment Growth Index**





sand mining. Very little effort has been put into promoting agriculture as a viable economic business in Buffalo County. Buffalo County has very productive soils and infrastructure for dairy, poultry, crop production, among other uses. Currently, there is renewed interest in alternative crops, particularly those that may feed into a growing “local foods” market, that may be more environmentally friendly and be less subject to soil erosion issues than row crop production. As indicated in Figure 11, the rapid

decline of dairy farm numbers since 2008 resulting in a drop in agricultural employment.

There is also research (University of Wisconsin-Platteville, Professor Chris Baxter) that indicates that the recovery time of productive agricultural soils that has been removed for mining activities may take several generations to return to productive use. While the mines may be reclaimed and provide open green spaces, the ability of returning the land to its current level of productivity may take decades.<sup>2</sup>

One of the difficulties with Figure 9 is that the three dominate industries (transportation, farming, forestry-fishing and related services) creates a scaling issue and compresses most industries in the County. To expand that compression we remove the three dominate industries (Figure 12).

In a small economy like Buffalo County, one business can make a significant impact. The Waste Management cluster is largely due to a single small business in Cochrane. They have done an excellent job and continue to expand and grow by taking on other service enterprises. Forestry, while being a very small industry, the forest resources could provide the foundation for the growth of many industries. In Figure 12 forestry industries tend to be traditional extractive industries like lumbering. But non-extractive uses such as hunting and recreation could provide a growth.

<sup>2</sup> As one removes the “over burden” soil that lays over the resource that is to be extracted, one destroys the current soil structure and with it the productivity of that soil. It is important to first remember that soil formation is a continual process and once removed and replaced by mining can never “catch up” to un-mined soils. Over time the soils can once again become productive, but the soil depth, subsurface hydrology, type of vegetative cover, and treatments to restore organic matter will all affect how fast these soils again become productive. We do know from some studies that to once again identify identifiable soil horizons is not measured in years but in decades. Reclamation of mining sites should be based on current soil productivity, topsoil thickness, and topography of the site. The studies should be performed prior to the start of mining operations. Rapid reclamation is necessary to stabilize soils and get a diverse sustainable plant community established to begin the soil healing process and control erosion. We can never fully repair the soil, but we can minimize the loss of productivity with reclamation planning before mining and strict rules for reclaiming the land following mining. Reclamation planning by qualified experts prior to mining will also benefit the surrounding community and businesses by studying soils and flow patterns of surface and subsurface water resources.

Tourism, traditionally measured through accommodations (hotels, motels, bed & breakfasts, camp grounds), restaurants and taverns/bars, entertainment venues, and selected types of retail, does not appear to be a strength or cluster for Buffalo County. Using 2010 county sales tax data to analyze local retail and service markets reveals that Buffalo County has a much stronger presence in accommodations than one would expect.<sup>3</sup> Indeed, the accommodations sector has a “surplus” of \$6.4 million dollars. In other words, the accommodations industry has \$6.4 million more in taxable revenue than one would expect if the sector were performing on par with the state average. At the same time, the restaurants and taverns/bars sector has a “leakage” of \$16.3 million dollars. These are potential sales that are lost. This may be explained in part by some of those restaurant/tavern/bar sales being captured in the accommodation sector (firms self-selected which industry classification they belong to). In an informal survey of tourism businesses, Friday is the busiest day for tourist to visit. Thursdays many times are as busy as Saturdays and in some cases busier. Sunday afternoons are actually quiet for tourists visiting from outside the area unless a special event is planned.

While tourism may not appear to be a strength or cluster for Buffalo County it is not clear if local businesses are not capturing the potential represented by summer visitors or the potential is not sufficiently large. Although the tourism impact numbers supplied by the Wisconsin Department of Tourism has been widely challenged for their accuracy, the data suggest that the tourism economy has been growing in Buffalo County. According to the Wisconsin Department of Tourism, visitor spending in Buffalo County increased by 8.2 percent between 2010 and 2011 compared to a state-wide increase of 7.9 percent. Regardless, the effect of sand mining may be significant for some tourist types of businesses. From the community meetings and interviews with a sample of business owners, two concerns were raised: (1) Will mining negatively impact the aesthetic beauty of the County that attracts tourists and (2) Will the increase in sand truck traffic discourage visitors to the area? In a purely economic sense – does the potential of reduced tourism business outweigh the potential economic activity of frac sand mines?

The questions that must be addressed from an economic base perspective are:

- ***Is frac sand mining compatible with other sectors of the County's economy?***
- ***Can agriculture grow and prosper if mining is removing land from production?***
- ***Does mining and the related increase in truck traffic create a conflict with a potential for future tourism development?***
- ***Does mining place a limit on amenity driven in-migration into the region?***<sup>4</sup>

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<sup>3</sup> S.C. Deller. 2011. “A Trade Area Analysis of Wisconsin Counties: Update for 2010. Department of Agricultural and Applied Economics, Staff Paper No. 558. University of Wisconsin-Madison/Extension (July). <http://www.aae.wisc.edu/pubs/sps/pdf/stpap558.pdf>

<sup>4</sup> Over 96% of the people that returned surveys during the Buffalo County Comprehensive Land Use Planning indicated that they live here because of the natural beauty of the county and that the natural beauty needs to be preserved.

- ***Does mining create labor shortages in other sectors of the local economy?***

To help provide insights into the potential answers to these questions we provide three additional levels of analysis. First, based on applied research, what do we know and do not know about the impact of mining on local economies? Second, what is the economic impact of mining compared to other sectors of the Buffalo County economy? Third, based on community meetings conducted in support of this study, what are some of the issues and opinions offered by residents of Buffalo County?

### **The Community Economics of Mining**

The research on the economic impacts of mining is varied and widely distributed across the sociology, economics, planning and geography literatures. There are several themes that come through that warrant discussion.<sup>5</sup> Each will be discussed in turn. But the overriding theme is often in the context of the “resource curse”. Often times the region’s endowment of natural resources, such as frac sands, defines what economists refer to as their comparative advantage and as a consequence, their economic growth strategies. In the case of subsurface mineral resources an analogy is often made with “buried treasure” with technology providing the “key” to opening the vault to economic growth. The external sources of investment for mining projects creates a spread effect which drives economic expansion, moving the regional economy to higher levels of socio-economic well-being. The initial investments jump-start the economy and the extraction and export of the resource spurs a cycle of economic growth. For many parts of Wisconsin the comparative advance and “buried treasure” are the unique sands that are required for extraction of some oils and gas deposits through fracking technologies.

Much of the research concludes that because of the ownership structure of the mining firms and in developing countries, lax if non-existent environmental or labor safety standards, very little of the economic benefits are retained in the local economy. The growing pool of “resource curse” literature suggests that robust economic growth and development from resource extraction activities should be considered the exception rather than a general rule. Indeed, mineral resource extraction as a mode of regional development has become a “pariah”.

**Ownership Structure Matters** One of the key considerations from our understanding of the mining industry and the available research is that the ownership structure of the mining operations matter. In the simplest sense, where do the profits flow? If the mining operations are locally owned and controlled, profits are more likely to remain in the local economy. If the mining operations are not

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<sup>5</sup> Much of this discussion draws on the study S.C. Deller and A. Schreiber. 2012. “Frac Sand Mines and Community Economic Development.” Department of Agricultural and Applied Economics Staff Paper No. 565. University of Wisconsin – Madison/Extension (May).  
<http://www.aae.wisc.edu/pubs/sps/pdf/stpap565.pdf>



locally owned, then profits are removed from the local economy. For many mining operations, the ownership is in the form of larger national or international companies where the corporate headquarters are located elsewhere. In this case, the profits will flow away from the community.

Ownership structure of the sand resources is also important. The sale prices being offered to current owners of potential sand mines are significant. The owners of these resources are potentially looking at significant windfalls of income. But a study of the gas fracking fields in Pennsylvania by researchers at the Pennsylvania State University found that many of the developed sites were owned by non-local residents. The Penn State researchers estimated that as much as 50 percent of the lease payments were not going to local residents but rather to absentee owners living predominately in the Philadelphia and Pittsburgh metropolitan areas.

Sand mining has a significant trucking component in their business. If the trucking firms are owned and operated locally, this would be a positive to the local economy. Again, if they are owned outside the county or area the economic benefits are less. Locally owned companies are also subject and vulnerable to instability of the mining industry and may not be able to withstand short- or long-term shut downs of the mines. The ramifications of the instability of mining are discussed in more detail below.

**Who Takes the Jobs?** One of the primary motivations for the promotion of frac sand mining in Buffalo County is the creation of jobs. The slow recovery from the Great Recession of 2008-2009 has placed job creation at the forefront of many policy discussions. Based on our current understanding of the mining industry in the U.S. there are three issues to consider here.

First, mining tends to be dominated by a transient workforce that commonly relocates as mining employment opportunities become available. An extreme example of this are the “man camps” associated with the fracking operations in North Dakota and eastern Montana. Miners freely move from one fracking operation to the next. One can expect that as sand mining becomes more prevalent in western Wisconsin it will attract more of this transient workforce. This will directly affect the potential economic impact of mining operations on the local economy. Much the same as non-local owners of the mining resources, many of these transient miners have weak social and economic ties to the local community. For example, many of these more transient miners are likely to send a significant portion of their earnings to family members outside of the community.

Second, current research suggests that rural U.S. counties that are more dependent on mining for employment tend to have slower population growth rates. This empirical result is generally explained by the negative amenities that mining operations are associated with. These negative amenities can range from poor aesthetics associated with mining, particularly open pit mining, to concerns over water and air quality and noise pollution. In essence, people prefer not to live near mining operations. This result questions whether potential workers and their families are willing to move into the area or would they prefer to live elsewhere and commute?

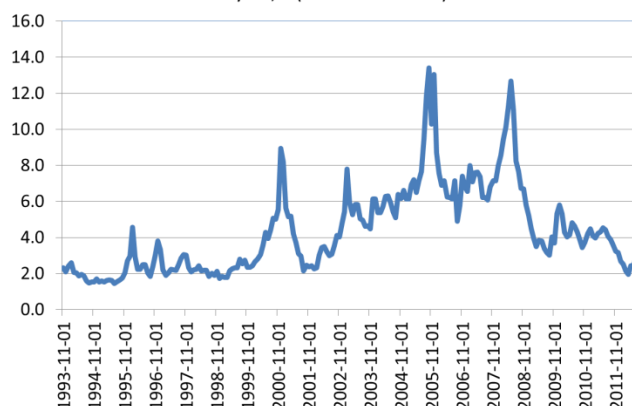
Third, through the notion of the “job-chain” will workers who are currently employed in Buffalo County “move-up” by accepting higher paying wages with the mining operators. Movement up the job-chain is generally considered a positive economic improvement because workers are earning higher wages and incomes increase. This creates openings at the lower end of the job-chain which might be appropriate for new entrants to the labor force. The challenge for Buffalo County is that the limited supply of labor (a smaller population base that tends to be older) may create difficulties for the businesses offering these lower paying jobs. This may force these firms to increase wages (a positive) or may force them into closure (a negative).

The answer to “who takes the jobs” has a significant role to play in the potential economic impacts of the sand mines on Buffalo County. If the jobs are filled by more transient workers or in-commuters the impacts of the mines will be significantly smaller. If the jobs are filled with new in-migrants who relocated with families, the impacts will be significantly larger.

**Stability of the Industry or Flickering** One of the largest concerns with mining as an industry contributing to local economic well-being is the inherent instability of the industry. Widely referred to as the “flickering effect” many mining operations are very sensitive to commodity prices and will temporarily shut-down operations. As the price of the commodity “flickers” so does the operations and employment at the mine. From WWII to the 1980s mining employment was extremely unstable but over the past 20 years the industry has become less labor intensive and more capital intensive. In essence, mining operations employed few workers and relied more intensively on equipment. This not only changed the occupational mix of mining jobs (higher skills) but also dampened some of the employment instability.

The shift of many power-plants away from coal to natural gas coupled with other demand factors resulted in a sustained increase in the price of natural gas from about 2001 (Figure 13). Given advances in fracking technologies and rising natural gas prices there was a “boom “ of natural gas fracking resulting in a significant increase in the supply of natural gas within the U.S. This rapid expansion of supply resulted in a significant decline in natural gas prices over the past few years (Figure 13). This “boom-bust” in natural gas prices has led to some instability in the natural gas

**Figure 13. Natural Gas Price:**  
Henry Hub, LA (Dollars Per Million BTU)



fracking industry which spills over into the demand for frac sand. As natural gas prices drop, the profitability of opening new gas fracking mines, the point at which frac sand is the most demanded, becomes questionable. The resulting instability in natural gas directly translates into instability in the demand for frac sands.

While frac sands are also used in the extraction of shale oil, in which prices have

been relatively more stable, there is already evidence of some Wisconsin sand mines slowing production. Some truckers who “moved up the job-chain” have been laid off and other mines are operating only four days a week. This is not to say that the market for frac sand will disappear, yet it does drive home the inherent instability of the mining industry. If Buffalo County elects to move forward with more sand mining operations, the County must put into place plans to address periods of instability in the industry.

**Boom-Bust Cycles** Mines by their very nature have a definitive life cycle: the sands are not a renewable resource and will eventually be depleted. Once the resources are depleted all mining operations will cease to operate and all jobs associated with the mines will disappear. Unfortunately, nearly all the studies that explore the boom-bust cycle explore very large mining operations in relatively remote rural areas. While the overall size of sand mining in western Wisconsin may be comparable, the geographic dispersion of many smaller mines may not be comparable.

The lessons learned from other rural communities can be insightful for Buffalo County.

- *Because of the transient nature of many mining workers they are less likely to remain in the community after the mines close.*
- *The infrastructure investments made to support the mining operations during the “boom” are underutilized after the mining operations close.*
- *Many studies suggest that the negative economic impacts of the mine closure are greater than the positive impacts of the mine opening and operating. Often the mining operations displace other businesses (wage pressures via the job-chain effects, incompatible businesses such as tourism and/or agriculture) and these types of businesses fail to return post mine closure.*
- *Some studies suggest that because of the inherent instability of mining (i.e., the flickering effect) the anticipated spillover development (e.g., retail and personal service businesses) does not take place.*
- *In some states and/or communities with weak or non-existent environmental regulations the damage done by the mining operations significantly limits future potential use of the land for redevelopment.*

Mining dependent communities that do not actively plan for and prepare for the closure of the mining operations are most likely to experience strong negative “bust effects”.

### **The Potential Impacts of Mining and Other Industries**

To gain insights into the potential economic impacts of the proposed mining operations we explore four “what-if” scenarios. Specifically, we use the proposed sand cleaning facility that would employ

about 30 people as a benchmark. To compare we examine the impact of a sand mining operation that would also employ 30 people, an expansion of dairying in the County that would involve 30 new jobs, and an expansion of tourism/recreation with 30 new jobs, 15 in restaurants and 15 in hotels/motels.

Each of these industries contributes to the local economy in three ways. The first is the “direct effect” which would be the businesses themselves (the sand cleaning facility, the mine(s), the dairy operations and the tourism businesses). The second is the “indirect effect” associated with these businesses buying non-labor inputs into the production process. This might be fuel for mining and agriculture equipment (trucks, tractors), or local foods for restaurants. The third is the “induced effect” which is labor spending its money in the local economy. For simplicity we assume that all mining employees are residents of the County and are not transient workers sending a portion of their wages to family members outside the County. All results are specific to Buffalo County and reflect the state of the County economy in 2010.

The results for the sand cleaning operation are provided in Table 2. We are limited in our analysis in that it is not clear what the industry revenue or sales of the operation will be. This is proprietary information that is not at our disposal. We are limited to the employment impacts only. In other words, we do not know what the “indirect” impacts are and are limited to the “direct” and “induced” impacts. Hence, the results presented in Table 2 may be considered conservative. We assume that there will be about 10 jobs with wages/salary of about \$50,000 each and 20 jobs with wages/salary of about \$30,000 each. Total new labor income that will be present in the County will be \$1.1 million.

In total, the sand cleaning operation will have an economic impact on Buffalo County of about 35 jobs

Table 2. Sand Cleaning Operation Impacts on Buffalo County

	Employment	Labor Income	Total Income	Industry Sales
Direct Effect	30	1,100,000	1,100,000	n.a.
Indirect Effect	0	-	-	-
Induced Effect	5	99,455	256,585	444,565
Total Effect	35	1,199,455	1,356,585	444,565
Multiplier	1.153	1.090	1.233	n.a.
Agriculture	0	460	1,919	4,437
Mining	30	1,100,000	1,100,000	n.a.
Construction	0	1,738	2,356	5,548
Manufacturing	0	344	743	4,597
TIPU	0	7,516	19,805	25,619
Trade	1	23,738	40,722	59,330
Service	3	60,742	186,936	324,046
Government	0	4,913	4,100	20,974
Income Tax	1,994			
Sales Tax	10,023			
Property Tax	13,487			
Other	5,059			
Total	30,563			

(the direct 30 plus an additional five jobs through the multiplier effect) and about \$1.2 million in labor income (wages, salaries and proprietor income) and \$1.35 million in total income (labor income plus all other sources of income including transfer payments, dividends, interest and rental income). Because we do not know what the property tax assessment on the processing facility might be, the tax impacts in Table 2 reflect only revenues generated

through the “direct” and “induced” effects. The bulk of the income and sales tax revenues will flow to the state government with about \$900 of the sales tax flowing to the Buffalo County government through its county sales tax. Again, the \$13,500 in property tax does not necessarily reflect true property taxes paid by the facility.

The multipliers here, while not reflecting the indirect spending on the sand mining cleaning facility (e.g., fuel, supplies, etc.) are relative small (1.153 for jobs, 1.090 for labor income, and 1.233 for total income). Because the impacts here are examining the impact of labor spending wages/salary in the local economy these relatively small multipliers have a direct interpretation. Specifically, small multipliers are generally associated with the lack of the local retail and service markets to capture and retain those dollars.

As with the sand processing facility we do not know the specific financial characteristics of any single proposed sand mine. But because sand mining is a well-established industry (active sand mining for concrete and glass was present prior to the demand for sand for fracking) we can use industry wide averages to estimate what a sand mine that employs 30 people might look like in Buffalo County. The results of this analysis are provided in Table 3. A sand mine with 30 jobs will have a total economic impact of 41 jobs, \$1.5 million in labor income, \$2.4 million in total income, and total industry sales in the County will be \$5.7 million.

The computed multipliers reported in Table 3 are particularly useful for future consideration. Here, for every ten jobs in sand mining, an addition four jobs will be created elsewhere in the County economy. For every \$1,000 in labor income paid by the mine an additional \$221 of labor income will

be generated elsewhere in the County economy via the multiplier effect. Similarly, for every \$1,000 of total income, an additional \$435 of total income will be generated elsewhere in the economy and for every \$1,000 of revenues generated in sand sales, an additional \$295 in industry revenues or sales will be created elsewhere. These multipliers are specific to sand mining in Buffalo County and can be used to assess the potential impact of any size sand mining operation in the County. Note that the multiplier

Table 3. Sand Mining Operation Impacts on Buffalo County

Impact Type	Employment	Labor Income	Total Income	Industry Sales
Direct Effect	30	1,224,278	1,674,013	4,416,935
Indirect Effect	5	144,512	399,714	735,695
Induced Effect	6	125,859	328,479	566,003
Total Effect	41	1,494,650	2,402,206	5,718,633
Multiplier	1.373	1.221	1.435	1.295
Agriculture	0	594	2,522	5,916
Mining	30	1,224,293	1,674,033	4,417,000
Construction	0	4,470	6,368	16,519
Manufacturing	0	858	1,623	8,521
TIPU	2	109,666	290,122	380,552
Trade	1	38,975	68,837	97,320
Service	8	102,757	347,872	740,151
Government	0	13,037	10,829	52,654
Income Tax	30,377			
Sales Tax	74,420			
Property Tax	100,538			
Other	38,199			
Total	243,534			



impact is fairly evenly distributed between the “indirect” (business-to-business transactions) and “induced” (labor spending wages) effects.

Notice that the multipliers for the sand mining operations are slightly bigger than the multipliers for the sand processing facility. This is because we are able to adequately capture the indirect effects in the mine operation that we cannot capture with the sand processing facility. Although the mining operation multipliers are slightly larger, they still point to the weakness of Buffalo County to capture and retain spending within the County’s economy. *In essence, the lack of retail and service industries within the County will necessarily dictate that the economic impacts of the mining operations will be relatively modest.*

The additional tax revenues that are generated are also approximations because it is not clear how

Table 4. Dairy Operation Impacts on Buffalo County

	Employment	Labor Income	Total Income	Industry Sales
Direct Effect	30	195,511	1,430,326	3,677,833
Indirect Effect	7	187,678	472,707	1,493,494
Induced Effect	2	34,706	89,647	155,234
Total Effect	38	417,895	1,992,680	5,326,562
Multiplier	1.270	2.137	1.393	1.448
Agriculture	31	204,480	1,455,525	3,787,308
Mining	0	20	27	88
Construction	0	6,927	10,355	29,144
Manufacturing	1	33,152	107,038	819,976
TIPU	1	63,505	145,247	201,907
Trade	1	44,848	87,510	111,955
Service	4	59,070	181,806	354,870
Government	0	5,893	5,171	21,313
Income Tax	8,206			
Sales Tax	34,030			
Property Tax	45,829			
Other	30,468			
Total	118,533			

property taxes will be determined on the mining operations themselves. But based on our best estimates, a sand mine with 30 employees will generate about \$244,000 in additional revenues going to government. Again, all of the income taxes will flow to state government as will most of the sales taxes. Again, given the County’s sales tax the County should receive about \$6,700 of additional sales tax revenues. The economic activity generated by the mine(s) could generate about \$100,000 in

additional property taxes with those funds being distributed between the relevant municipality, school district and the county government. But again, it is not clear how the property taxes on the mining operations themselves will be determined.

Now consider the potential economic impact of an expansion of dairy operations within the County that is the equivalent of 30 new dairy farm jobs (Table 4). The total employment impact of adding 30 dairy jobs is 38, the original (i.e., direct) 30 plus an additional 8 jobs through the multiplier effect, \$418,000 in labor income, almost \$2.0 million in total income and \$5.3 in industry sales or revenue. The noticeable differences between labor and total income reflect the nature of how farmers receive income. Because of the nature of dairy programs, much of the income comes in the form of transfer

Table 5. Impact of Tourism Expansion on Buffalo County

Impact Type	Employment	Labor Income	Total Income	Industry Sales
Direct Effect	30	296,177	697,750	1,591,649
Indirect Effect	4	81,877	189,056	388,152
Induced Effect	2	34,661	90,284	155,714
Total Effect	36	412,715	977,090	2,135,514
Multiplier	1.187	1.393	1.400	1.342
Agriculture	0	423	1,840	4,355
Mining	0	4	5	17
Construction	0	6,717	10,037	28,224
Manufacturing	0	2,436	3,884	18,646
TIPU	0	20,685	64,643	79,140
Trade	1	13,546	24,334	33,755
Service	34	355,507	860,224	1,937,591
Government	0	13,396	12,121	33,786
Income Tax	8,333			
Sales Tax	53,140			
Property Tax	71,450			
Other	22,849			
Total	155,772			

payments. This is more of an accounting detail, specifically how the data are reported, than a fundamental economic concern.

The final scenario we explore is the expansion of Buffalo County tourism through the creation of 15 new jobs in lodging and 15 new jobs in restaurants and bars/taverns. We use existing County averages for these two sectors so the impacts are again specific to Buffalo County. The results of the analysis are provided in Table 5.

Expanding tourism by 30 jobs will result in a total employment increase of 36 jobs, the original 30 plus an additional six jobs via the multiplier effect. Total labor income generated is about \$413,000 and total income is \$977,000. While the employment impacts are larger than those associated with mining, the income impacts are much more modest. This is a reflection of the lower wages/salaries that tend to be paid in the tourist industry. While not all wages/salaries in the tourism sector are low, for example a hotel/motel manager tends to have an annual salary of \$54,000 (all wage data used here are Wisconsin averages for 2011), most are more modest such as cashiers with an annual salary of \$19,000, retail sales persons earn about \$24,800 a year and lodging maids earn about \$20,000 per year. We can see that this increase in tourism activity also generates additional revenues for the public sector including \$53,000 in sales taxes, of which about \$4,800 will flow to County government and almost \$71,000 is property taxes that will flow to not only county government but also to school districts within the County as well as municipalities where the development occurs.

From these four different economic impact scenarios, five issues are identified that the County should be aware of as the development of sand mines is considered.

- ***The wages/salaries that are paid are an important determinant of the potential impact on the local economy.***
- ***Non-labor related expenditures of the businesses, such as business-to-business transactions, can be equally important to the economic impacts.***

- *These scenarios can also be used to examine the impact of alternative uses of resources. For example, if the promotion of mining displaces dairy farms, the positive impact of the mine must be off-set by the negative loss of the agricultural operations. The “net” economic impact is relevant.*
- *Mining operations have a finite life (limited resource) and the mining operations will eventually cease to exist and the displaced economic activity may have a longer life span. For example, agricultural land taken out of production for mining will take decades to return to productive use.*
- *Perhaps most important, the ability of the local County economy to capture the economic spillovers (i.e., multiplier effect) appears to be limited for Buffalo County. In essence, the business infrastructure necessary to maximize the economic spillover of mining development appears to be severely limited.*

Care must be taken with the economic impact scenarios examined here in that these are not “cost-benefit” analyses. Consider, for example, the fiscal impacts discussed above. It is well known that the introduction of mining operations will produce a significant increase in heavy truck traffic. This will result in an acceleration of highway/road deterioration. That deterioration must be matched by an increase in highway/road maintenance expenditures. We do not know, based on the analysis presented here, if the revenues generated will be sufficient to off-set the increases in expenditures.

### **Citizen Perspectives**

In order to gain the perspectives of local citizens, three open community meetings were held. Each meeting addressed a specific set of issues: general economic trends of the Buffalo County economy, a review of the economics of mining and a discussion of what we know and do not know about how mining may or may not impact the local community, and finally a series of round table discussions about economic growth and development issues. This report has been structured to mirror the themes of those three community meetings. This section of the report is intended to capture the major issues from the input of residents who participated in those meetings.

To help facilitate the third and final meeting, we employed a relatively new technology which allowed each meeting participant to “vote” or express an opinion on a range of statements about the County. Because the whole of the effort was limited to the community economics of the proposed frac sand mines, the range of statements was limited to issues pertaining to the County economy and efforts to promote economic growth and development within the County.<sup>6</sup> The intent behind using this new technology was to not only gather additional information, but also to serve as a mechanism to stimulate discussion.

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<sup>6</sup> Often the terms economic “growth” and “development” are used interchangeably. As used here the two terms have distinct and different meanings. Growth is generally associated with more jobs, more people, more income and more businesses (e.g., Figures 1, 3 and 6). Economic development is generally associated with notions of economic opportunities, quality of jobs, and notions of equality.

It is important to note that the results of this “survey” are not scientific in the sense that a representative sample of local residents were targeted. Rather, the sample is composed of residents who self-selected to attend the third meeting and participate. While we did not explicitly ask if those in attendance were in favor or opposed to sand mining, it became clear that some in attendance supported the mines and some strongly opposed. The majority, however, were interested in learning more about the issues around sand mining and were seeking strategies (policies) that would allow mining to occur but with minimum damage to what they viewed as the unique quality of life in Buffalo County. Indeed, several participants were interested in offering ideas where the County could “have its cake and eat it too.” The results of this exercise are provided in Table 6.

When asked if the Buffalo County Board has a pro-business attitude toward economic development, respondents were mixed with about 39 percent either agreeing or strongly agreeing but 48 percent disagreeing. But when asked if the county leaders work well with organizations that aim to promote economic development or are actively promoting economic development, nearly 9 in 10 responded that the County was not active. The tone of the discussion left a strong impression that residents believe that the County is not sufficiently proactive in the area of economic growth and development. When the County is reacting to an economic development opportunity they tend to be supportive but is in a reactionary state rather than a proactive state. For example, nearly 9 in 10 participants either disagreed or strongly disagreed with the statement: “our community has an active program to encourage and support existing businesses.” Nearly 8 in 10 either disagreed or strongly disagreed that “the community has identified the types of businesses that fit the needs and desires of our community.”

The discussions painted the following situation: the County does not have a clear forward looking vision of the local economy, thus when economic growth opportunities present themselves, such as sand mining, there is not criteria upon which to think about the opportunity, and because the County is not actively engaged in economic development activities the development that does occur is haphazard and not always consistent with the desires of residents. Some expressed concern that County decision-makers often overlook prior attempts to develop visions of the local community. For example, during the Buffalo County Comprehensive Land Use Planning exercise 96% of the people responding to surveys indicated that they live in Buffalo County because of the natural beauty of the county and that the natural beauty needs to be preserved (note that over 9 in 10 participants agreed or strongly agreed that “people in the community are generally proud of the quality of life here”). The challenge that the County appears to face is that it is ill equipped to allow sand mining to occur while protecting the quality of life characteristic that the residents of the County hold in such high regard. A more proactive approach to economic growth and development would better position the County and the communities within the County to address opportunities such as sand mining.

There was also some frustration that the County’s elected officials were not doing enough to engage community residents in their decision-making processing. For example 7 in 10 either disagreed or strongly disagreed with the statement: Buffalo County uses formal citizen working groups or advisory groups to help in our priority setting and decision making. Almost 8 in 10 disagreed or strongly disagreed with the statement: key local business leaders are sufficiently involved in the governmental

Table 6: Citizen Perceptions

	Strongly Agree	Agree	Disagree	Strongly Disagree	No Opinion
Buffalo County has a pro-business attitude and the County Board actively supports economic development.	12.9%	25.8%	32.3%	16.1%	12.9%
Buffalo County uses formal citizen working groups or advisory groups to help in our priority setting and decision making.	6.5%	19.4%	32.3%	38.7%	3.2%
Key local business leaders are sufficiently involved in the governmental process.	6.3%	12.5%	37.5%	40.6%	3.1%
Buffalo County has an effective local economic development organization.	3.0%	3.0%	27.3%	60.6%	6.1%
Our county leaders work together with other economic development related organizations.	0.0%	10.0%	46.7%	40.0%	3.3%
Our community has a zoning ordinance that designates an adequate supply of residential, agricultural, commercial, and industrial land.	3.4%	20.7%	31.0%	24.1%	20.7%
The community has identified the types of businesses that fit the needs and desires of our community.	0.0%	10.7%	35.7%	46.4%	7.1%
Our community has an active program to encourage and support existing businesses.	0.0%	3.4%	44.8%	44.8%	6.9%
Our community actively recruits targeted industries.	0.0%	0.0%	37.5%	62.5%	0.0%
Our community has completed an up to date tourism assets and marketing analysis and reported it to related businesses and local officials.	0.0%	9.4%	28.1%	46.9%	15.6%
The wages in our community are at a high enough level to help retain our existing workforce and attract new labor to the area.	3.2%	16.1%	29.0%	48.4%	3.2%
New or expanding employers would be able to find adequate numbers of qualified employees in our labor area.	6.5%	48.4%	22.6%	19.4%	3.2%
The highways serving our community are adequate for most manufacturing and distribution operations.	11.1%	59.3%	7.4%	22.2%	0.0%
Our community has an accessible group of local investors who could assist in financing a start-up business.	6.5%	32.3%	29.0%	25.8%	6.5%
Local or county government has created a Revolving Loan Fund.	9.7%	6.5%	16.1%	32.3%	35.5%
The people in the community are generally proud of the quality of life here.	44.8%	48.3%	6.9%	0.0%	0.0%
Quality advanced educational institutions are located close to Buffalo County.	37.9%	31.0%	24.1%	6.9%	0.0%
Buffalo County has a variety of active service organizations.	10.3%	65.5%	17.2%	3.4%	3.4%
Buffalo County has well staffed emergency response organizations.	36.7%	50.0%	13.3%	0.0%	0.0%

process. While participants greatly appreciated the opportunity to provide input into this study process requested by the County Board they wished that stronger citizen input processes were in place.

Beyond these general observations, participants raised several questions as well as suggestions (paraphrased by the authors):

- What are the contingency plans if a mining operation declares bankruptcy?
- How will we ensure the mining companies pay their fair share of wear and tear of local roads?
- Is the productivity of agricultural land being taken into account?
- What will the truck traffic do to the summer tourist trade?
- Will the increase in truck traffic pose a safety issue and are we in a position to deal with increased traffic accidents?
- Mines could negatively impact my property values, how can I be compensated?
- If I am approached by a mining company who do I turn to for help?
- How do I know if my elected officials are asking the right questions and willing to challenge the mining companies if they are not happy with the answers?
- Can we demand higher reclamation standards once the mines close?



- Can we limit the number/size of mines operating at any given time and truck traffic to certain days of the week, particularly in the tourist/summer season? (Look at Pepin County)
- How can we enforce mining companies to be “good neighbors”?
- Can we require mining companies to build some type of blinds (landscaping) to minimize their visual impacts?

While most of the participants were appreciative of the moratorium the County put in place, concern was expressed that it was not sufficiently long to put into place policies to maximize the positive economic impacts and minimize the negative impacts. As one participant summarized the concerns: “we are a sleepy little county, which we like, and we are not use to dealing with such controversy and I’m not sure that we can”. This comment came during the discussion of the level of proactiveness of the County when it comes to economic development efforts and the ability of the County to become more proactive.

### **Summary**

At the request of the Buffalo County Board, the University of Wisconsin-Extension, specifically the UW Buffalo County Cooperative Extension Office, was charged with studying the economics of frac sand mining in Buffalo County. To fulfill this request, the research team took a multi-prong approach: an analysis of the County’s economy, assessment of the current state of understanding of how mining impacts local communities, and through a series of community meetings identify current concerns, questions and strategy ideas surrounding frac sand mining in the County. This report has been intended to provide a summary of those efforts.

In our analysis of the County economy we found that population growth has been stagnant for a number of years, but there has been significant job growth as well as income levels. In addition, the County tends to have an older population and higher dependency on government transfer payments (e.g., social security) for income. This slow population growth coupled with an older population raises the question “who will take the jobs” as mining operations expand. Given the transient nature of mining employees it is possible that many of the jobs created at the mines themselves may be taken by in-migrants who may have weak linkages to the local community. We also found that trucking and agriculture, and to a much lesser extent, tourism, form the backbone of the local economy.

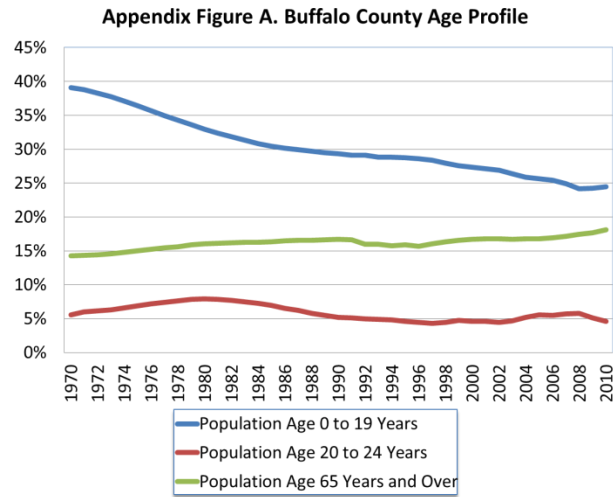
Mining by its very nature tends to be unstable and exhibits “flickering” in employment. This creates instability in the local economy that the community must be prepared to address. Indeed, the decline in natural gas prices has already seen a decline in the demand for frac sand and some sand mines in Wisconsin going to a four day operational schedule. This instability has often been the reason why communities do not experience the growth in spin-off business development. The instability creates too much risk and uncertainty that is unacceptable for most retail and service businesses that might be expected to start and grow. This is why the expected economic spin-offs are seldom realized.

Mines by definition are based on a finite resource and this can result in a “boom-bust” cycle for communities that are heavily dependent on mining for employment. Existing research suggests that communities are seldom prepared for mine closures and the negative impacts of closure can outweigh the positive impacts of the mine opening. This raised the questions: Is the County enforcing adequate reclamation standards and addressing the loss of jobs once the mines close?

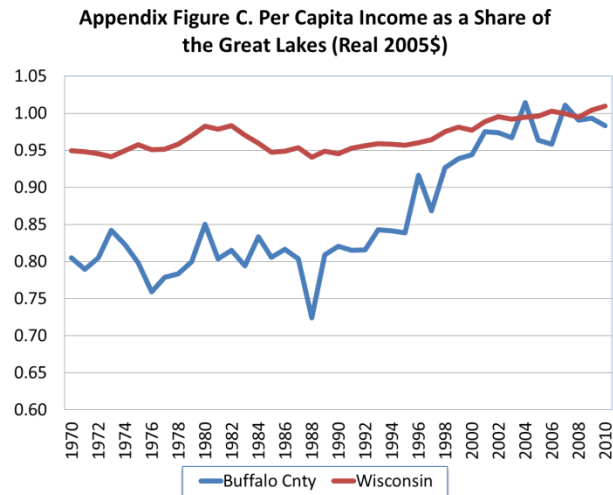
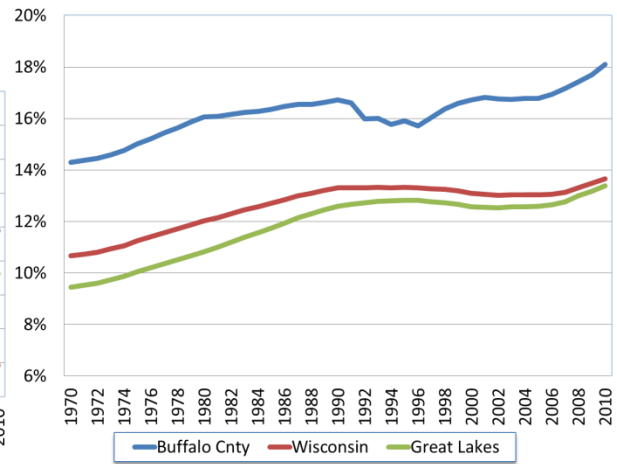
Exploring the economic impact of four different scenarios revealed that the economic multipliers for Buffalo County are relatively small, suggesting that the economic impacts of mines on the larger County economy may be more modest than expected. These modest multipliers are the result of modest retail and service industries that are present in the County. For example, where there are small grocery stores in Buffalo County, most residents do their grocery shopping outside the County. If the County is to maximize the economic impacts of the mining operations, efforts must be put in place to better capture and retain that economic activity within the County.

While some residents who participated in the community meetings that were held as part of this study were unconditional “pro-mine” and some “anti-mine” the majority was seeking common ground: How can we promote mining and capture as much of the positive economic impacts as possible while minimizing the negative costs? The concern of the majority attending the third and last community meeting was that the County was not sufficiently proactive to achieve this common ground. Some common ground suggestions were to limit the number/size of mining operations at any given time, limit truck traffic to minimize conflicts with the tourism industry, favor the protection of scenic beauty and protection of agricultural lands.

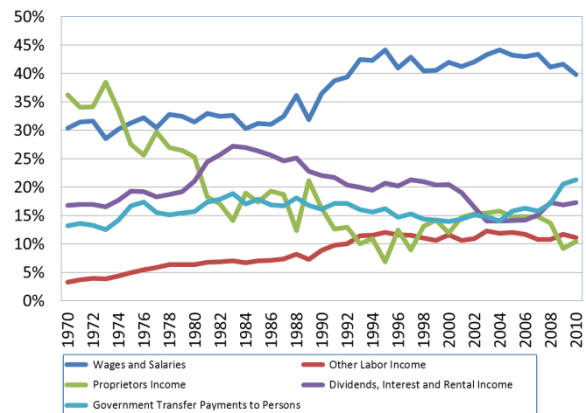
## Appendix A



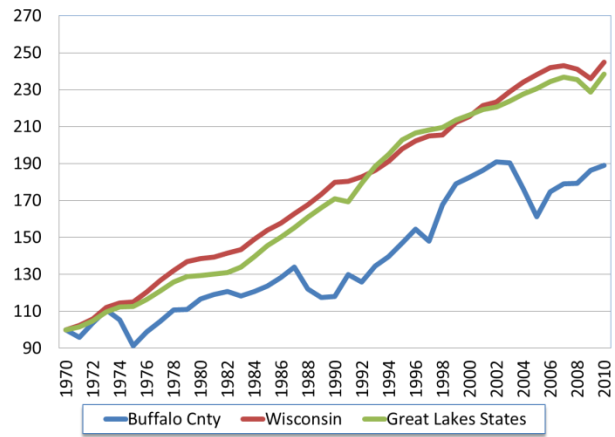
**Appendix Figure B. Population Age 65 and Over**



**Appendix Figure D. Sources of Income Shares for Buffalo County (Real 2005\$)**



**Appendix Figure E. Accommodations and Food  
Services Employment Growth Index**



## Appendix B

Notes by Carl Duley on Steve Deller's presentation "The Buffalo County Economy in Light of Sand Mining" May 1, 2012 Buffalo County Courthouse.

These notes are not intended to be a complete summary of the presentation, only to offer some general observations from one perspective (Carl's). Please review the complete presentation that was given.

- What are the important elements of the current economy that must be considered?
- Is the lack of population growth, or actually declining population, something the people of Buffalo County want? What are the consequences?
- Buffalo County population is older than Wisconsin, and school age kids is dropping faster than average in Wisconsin – consequences? Who takes the jobs if/when jobs are created? Where do they live?
- Buffalo County has no diversity within its population
- In the relatively small economy in Buffalo County, one business with good jobs, can make a significant impact in the overall economic picture. One example that was very clear was the expansion of operations of Marten Transport in Mondovi. Very clear that the expansion had a significant impact in the Buffalo County economy.
- In the power point slides, remember that the employment growth slides were; 1) just jobs located in Buffalo County, 2) the numbers in the slides are indexes, not actual numbers. Therefore in an industry like mining it may take less than 10 jobs to cause a huge spike in the index.
- Manufacturing 2 types: commodity – items sold at big box type stores and custom manufacturing – items made locally, not many jobs, but usually jobs with higher wages.
- Retail employment – does retail trade go up with an industry like mining? Depends if jobs are local, if people move to the county or commute, if people spend money at the limited number of businesses located in the county, and the historical instability of jobs in the mining industry.
- Currently, the growth industries in the United States and Wisconsin are the Health Care Industries, Financial Industries, and Management Industries – none of which are located in Buffalo County.
- State and Local government employment has been on the decline in Buffalo County since 2000 and actually since 1970.



- Agriculture as a county economy has been flat since 1970 (not a growth industry). Start of the declining dairy industry and a switch to agriculture industries that hire fewer people, farm more land per person, and need little infrastructure (few buildings) all contributing less to the local economy.
- 1940's – 1960's job growth came from Fortune 500 companies, since 1970's job growth has come from small business development. Buffalo County has lagged behind in small business development.
- Significant income in Buffalo County has come from Social Security benefits (increasing age of the population).
- Buffalo County has an advantage/cluster in the area of recreation. The size of the recreation is currently a small sector of the economy but it is growing and has been strong. Is this a sector that the county should target for growth? How much will mining and recreation compete?
- Transportation (trucking) is currently 24 of the Buffalo County employment – very dependent on one industry
- Agriculture is the 2<sup>nd</sup> largest industry (based on employment) providing 13% of the jobs. Unlike transportation, agriculture has been declining for reasons mentioned already.
- What can communities do to help industries with potential growth to grow?
- Suggestions for more information from meeting participants:
  - What does Buffalo County have in infrastructure to help the economy to grow (roads, rail, river)
  - Economic forecast information
  - Increase of state road use and effect on other businesses and road uses.

## **Appendix C**

### **Summary of Frac Sand Mining Meeting: Economic Considerations**

**Discussion held 10/20/2011 – Buffalo County Courthouse**

**Speaker: Dr. Steve Deller, UW-Cooperative Extension Economist**

**Summary by Carl Duley, Buffalo County UW-Cooperative Extension Ag Agent**

#### **Summary Comments by Deller:**

County/Town Discussions need to balance two major factors:

- Economic impacts of sand mining vs. Environmental impact
- Sand mining and the Land Use Planning wishes of the people in the County/Town

Economic Impact Assessment: A summary of some factors that are considered when conducting an economic impact assessment. Remember,

- Based on how many jobs and the pay scale they receive (this is the cash pay scale, because they do not spend non-cash pay on goods and services)
- How much cash does each worker have to spend in the local economy this is what creates the multiplier effect of creating new jobs.
- Multiplier effect in Buffalo County is very low (1.28) because we have a limited number of places for people to spend money.

[**Question #1** – What can Buffalo County (all units of government) do to create/encourage the growth of businesses that are located in the County to increase the multiplier effect of new jobs?]

- Another consideration in conducting an economic impact assessment is what % of the new jobs are filled by people living in the county versus moving into the county? This may be different if there is increased unemployment (or underemployment), but historically a majority of jobs in new industries are filled by people not living in the community.

[**Question #2** – Can municipalities do anything to encourage employment of citizens already living in the community?]

- If a number of people move into local communities, infrastructure may need to be added to meet the need of new families, i.e. school population, roads, housing emergency response, etc.

[**Question #3** – Can the current infrastructure in the county meet the needs of the new jobs being offered?]

- Where does the “profit” from the business go? Is it a locally owned business, or are the owners located in a different community or state? Businesses that are owned and financed locally contribute much more to the local economy than businesses that are owned outside of the local area.

- Who owns the land? Is the land owned by people who live in the community or live outside of the community or state? Income to landowners living in the community tends to give a higher economic impact to the local community.
- What is the speed of the industry? Development that occurs very rapidly gives little time for contingency plans or discussions to answer questions such as: Is our transportation system able to handle the change (physical and safety of the transportation system)? What are potential environmental impacts of the development? What are potential community changes as a result of the development? Etc.

### Discussion Q&A

- On-site processing versus off-site processing. Best paying jobs are on the processing side, so if processing is in Minnesota or another county, less returns to Buffalo County base.
- Tax assessment on Mines - ?????
  - Taxed as manufacturing after mining begins, determined by DOR not county local assessors
  - Taxed as prior use until mining actually begins
  - Very unclear at this point how tax rate will be determined. DOR is currently working on putting a FAQ factsheet together.
- Tax assessment on neighboring properties
  - It is generally accepted that homes and other property values decrease when a mine or similar development begins. This is mostly true for properties that can see the mine out their “back window”
  - The amount that property values are affected is unknown at this time, because there are few if any comparable sales. Tax assessors cannot adjust values without comparable sales.
- Sand mining, like many other types of development does not come free
  - Transportation – town and county road repair issues – may be sand from a different county coming through your county.
  - How much increased truck traffic before it becomes a safety hazard, town, county and state roads (Highways 35 and 37)?
  - How are small towns going to be affected by increased truck traffic? Possible effects on tourism business in the City and Villages along the Mississippi River.
- Rapid entry of “new” companies along with expansion by “established” sand mining companies
  - Know your company
  - Seek legal advice, with experience in mining
- Who negotiates conditions for the mines? Who looks out for neighbors and others in the county? Landowner rights are important, but the rights of all landowners need to be considered, not just the rights of the owner(s) with the mine.

**Group responses to the question, What is needed from UW-Cooperative Extension?**

- How do you evaluate a company when they approach you to sell or lease your property for a mine?
- Is there a list of attorneys that have experience in developing mining contracts?
- Post economic impact value of reclaimed land – examples from other mining operations on what works and what doesn't work, in uses for the land.
- Is there a central point of information on non-metallic mining for the state?
- Planning proposal to track the movement and development of mines. What timeline should the community expect when a mine is proposed/approved/operating/reclaimed?
- Get information out – UW-Cooperative Extension is limited to researched/unbiased information, unfortunately, there is little research based information available.
- Develop a Frequently Asked Questions factsheet
- Environmental and business impacts of a sand loading facility on small river towns.
- Pros/Cons and cautions for Town and County Boards – what questions should they ask?

Final comment: Towns Association should get together and develop a common strategy for addressing questions on sand mines. Share information between municipalities on transportation routes, etc.

## **Appendix D**

### **Community Economic Impact Study Discussion**

#### **Meeting 2**

**May 21, 2012**

#### **Notes from the World Café Activity**

**(7 small groups that were all asked to comment on the same three questions)**

##### **Question #1**

**Buffalo County has a declining tax base and population, what are characteristics of the “ideal” business for Buffalo County?**

##### **Question #2**

**People desire to maintain the natural beauty and environment of Buffalo County, how can sand mining fit into that vision?**

##### **Question #3**

**If sand mining is not the economic development business of choice, what business/businesses “fit” into economic development in Buffalo County?**

Table 1

##### **Question #1**

- Diverse Skills
- “Green” Eco friendly
- Fair # of employees
- Community Friendly
- Supports other local businesses
- Support for the elderly
- Flexibility of changing demographics
- Long Term succession
- Skill “Exchange” programs

##### **Question #2**

- Reclamation
- It Can’t – Detrimental effects on neighbors
- Green Berms – To obscure vision
- No idea – Need to see what it actually will be like
- It Can’t – Need assurance about water effects

##### **Question #3**

- Fish Factory
- Community Supported Ag

- Home based business internet (high speed)

Table 2

Question #1

- Grocery Store – Hardware Store
- Provide needed goods & services
- Provide services for local need
- Agri-business need – changes
- \*Need good paying jobs – Keep young people here
- Value Added production – don't just buy & selling products – create value added

Questions #2

- Traffic – manage to accept the fact that mining can take place
- Regulations from onset for mining
- Continue conditional use permit – Bonding for reclamation
- We hope to see the finished product (mine) looking OK

Question #3

- Wineries, Wine tasting, Breweries
- Ag production plants (cheese, cereal, poultry, meat, vegetables)
- Light Manufacturing – eg. Electronics, NANO Tech, forestry and wood processing
- Tourism – Recreation, Bait Shop, Canoe/Kayak, Wildlife
- \*Health Care

Table 3

Question #1

- Stability
- Stay here long term
- Provide services/products needed in our county not currently available
- Tourist Services
- Higher paying jobs
- Recreational Businesses

Question #2

- \*Reroute truck traffic - Alternate routes
- Limit # of mines at one time
- Limit # of trucks
- \*Stricter local reclamation requirements

Question #3

- Lower County – Utilize Rail System
- Manufacturing – Ashley Furniture

Table 4

Question #1

- Ag
- Retail – Tourism
- Local Government
- Green Energy
- Higher Pay with benefits
- Chamber at County Level
- Fits Infrastructure & Community Values
- Senior Services

Question #2

- Exceed minimum standards – air & water
- If mining – need strong reclamation plan in place
- If mining – small sites & long term versus large sites & short term
- Stay in Buffalo County
- Try to reduce traffic impact
- Mining companies need to be good neighbors, not just say it
- Continuity of agreements by new companies

Question #3

- Ag (Micro) (Specialty)
- Tourism
- Community Gardens
- Unique Restaurants (Pizza)

Table 5

Question #1

- Ag Based
- Tourism
- Small Business
- Construction
- Internet Based
- Attract Retiring People
- Attract Young People
- Good Child Care
- Business to take advantage of outdoors
- \*Green” Business – Stress
- Preservation of historic characteristics
- Fish Processing



#### Question #2

- Regulations
- \*Reclamation (State regulations not strong enough) (Landowners should be reliable for reclamation)
- Replant to original – ie: Trees – shrubs
- Complete process at site

#### Question #3

- Tourism, Recreation
- Manufacturing

#### Table 6

#### Question #1

- Older Population
- Bedroom
- Full-time non seasonal employment
- Environment friendly
- Wage & Benefit Package
- Business to increase tax rate
- Sales Tax

#### Question #2

- It Can't!
- Strong environmental protection
- Oversight
- Reclamation plans with community involvement and post economic value
- No sand trucking on county roads
- Prioritize permit process
- Limit acres mined, i.e. 25 acres
- Limit number of mines in township too
- May need major changes in zoning/industrial
- Good legal advice for county and zoning and landowners

#### Question #3

- Tourism – Build on land ethic that we have - hunting, cycling, fishing – expand
- Gambling
- Services that cater to retirees – example, resort- restaurants – river tours (**MAKE USE OF THE RIVER**)
- Ag – give young people a chance to be involved in Ag
- Internet - Technology

Table 7

Question #1

- Manufacturing - ex: water & sewer lack of
- Eco-type - ex: land
- Tourism

Question #2

- Reclamation – Park and other uses
- More top soil so can continue to Farm
- Zone Frac Mining Areas
- Bike Trails with roads built by sand mines away from main traffic roads

Question #3

- Manufacturing
- Retirement Community/Assisted Living/ Nursing Care
- Sporting Goods
- Organic Foods Coop

**Summary statements by each group of what they thought  
was most important:**

- Reclamation of sand mine for park or other uses
- Retirement Community
- Home based internet business
- Need good paying jobs to keep young people
- Tourism – River based
- Look at alternate route for truck traffic
- Strength in Agriculture
- Reclamation – stronger than state, land owner & mining co responsible
- Stress green businesses
- Look at Pepin County plan – limit number of mines & acres
- Services that cater to retirees – River based