Regulations should ensure that mining operations have sufficient resources at the end of operations to pay for full reclamation. This should be accomplished via bonding, insurance, payment of removal fees per ton of sand excavated or license fees. It is possible and even likely that these operations will end when economics are poor and they are in the worst position financially to do what they promised when they started.
FRAC SAND MINING IS HELPING DEVELOPE THE BAKKEN OIL PATCH AND RECOVERING MORE NATURAL GAS ! WE NEED TOO STOP IMPORTING OIL FROM THE FAR EAST !
We move to the area 7 years ago, and established a home and hobby farm. We enjoy the community and the culture. But we had no idea we would be living near sand mines when we moved here from Minnesota. What a tragedy to see people take this beautiful area for granted, and sell it for the profit of sand!
Does this operation take alot of water? for cleaning, washing etc.
Affect on tourismAffect on huntingAffect on local businessAffect on the local lifestyle
Links? I'm thinking that you can figure out your own links; they are out there. I'm tired of trying to educate boards that won't read the material that citizens give them. I'm not doing the research for you. Ask the governor for some funding to provide research and don't forget to vote!
All of the topics mentioned affect the public safety along with environment and animals -- how many people are making the money and does this outweigh the pollution etc. of the entire fracking process that this sand is so needed. The sand is needed here to cleanse our water and as a barrier due to our topography or karst landscape.
Long term effects to the local economy.Long term effects to the health of the citizens. The fact there aren't good studies of all the health effects and these should be studied before the mine is allowed. Water use and quality are a big important concern. Air quality of the area should be tested and studied before a mine is approved.
Removing the silica sand by rail? How many derailments have there been? What is the potential of threat to towns along the railway? How is air/water quality affected by these derailments? Who pays for health damage long term?
Please, please, please stop the flood of destruction. Stand up to the obligation of the DNR to protect the citizens of this state. We are powerless to protect ourselves if you do not help us. This is your job!
I am overall concerned about the rate of exploitation of our natural resources to the detriment of the environment, and how it has been relatively unchecked and unregulated, allowing industry to regulate (or not) regulate itself. More oversight is needed, the sooner the better.
I want my tax dollars to support a DNR that has integrity. I understand that there have been many changes in the organization and it seems those changes have occurred to facilitate exploitation of Wisconsin's natural resources rather than protecting them and protecting us from the dangers of that exploitation. I don't have any personal or political axe to grind but it has been easy for me to come to these conclusions of corruption in the DNR from what I have read from various legitimate and well-regarded sources.
ground poisoning the water system.
How much is too much? How can a proper balance be achieved? Is more time, perhaps, necessary to think it through? Is it wise to permit a mine and worry about the consequences later, when it's too late? Wouldn't it be better to slow things down and take some time to study the issue thoroughly? It's not only about jobs and the economy. The DNR should look at the issue from a long-term rather than a short-term perspective. It's what Wisconsin residents need. Would an expansion of tourism be a better option than some of these mine proposals?
The DNR is supposed to protect our resources and, in turn, the health and safety of our inhabitants. More and more, I see the DNR siding with corporations and not doing the job they are enlisted to do. I hope we can correct this in the very near future!
http://www.sandpointtimes.com/pdf/frac-sand-impact-tourism-property-values.
http://thinkprogress.org/climate/2014/10/31/3586561/global-groundwater-crisis/There is a global groundwater crisis and perpetuating high consumption of water is just wrong. http://www.eoearth.org/view/article/150159/Restrictions on the number of mines needs to be in place, the aquifer cannot sustain the draw down. Stream flow and well activity in areas of mining should be closely tracked. Well depths and water quality of all wells should be considered.Total costs of state and local resources being spent on research, studies, surveys, inspections, analysis, etc. needs to be considered and charged back to the mining industry.
I think Wisconsin should work with North Dakota and slow fracking down before it permanently disrupts the geological structure of the Midwest forever.
How is waste produced by mining being handled
Thus far, confidence has been lost. The public does not believe they are being heard on this issue and residents are suffering. The air and water quality will lead to health concerns including deaths. This is serious. Please treat it as such. A slight and short term economic gain is not worth the drastic and irreversible long term damage.
DNR should read their daily papers to see how many comments are made in the Opinion pages. Also, the E.C. Leader-Telegram has many, many articles about sand mining--none, of which (I think) say any positive aspects of sand mining. Plus, the sand goes to those states where the poor citizens there have gassy water, and all the negative results of the oil mining operations. Plus, Minnesota is now making plans to prepare the 326,170 citizens who live near oil train danger zones to be able to deal with any possible emergencies. GREAT!!!!
Think like a wise man did over a hundred years ago:The earth does not belong to man, man belongs to the earth.All things are connected like the blood that unites one family.Man did not weave the web of life, he is merely a strand in it.Whatever he does to the web, he does to himself. Chief Seattle - 1853

ALL people in the state of Wisconsin are ultimately affected by frac sand mining. This is a serious problem. I feel that frac sand mining should be banned for the reasons I stated in this questionnaire.
I am against the devastating affects of the mines however, the mine owners need to be held responsible for any permanent damage that has been caused due to their mines. This damage is irreversible and should be considered against the overall benefit of the state of Wisconsin. SSS owns the mine next to us. They will go back to Texas and leave us the permanently destroyed ecosystems. Perhaps it is a better investment to teach people how to help fix the lands after the mines stop making money.
We should not be supporting an oil industry that destroys air quality and pollutes our water. Let's cover the proposed sand mines with solar panels and wind turbines Our short-sighted goals will come back to haunt us.
Please consider the quality of life for Wisconsin residents for years to come, rather than immediate income for a few land owners and the mining companies. Our green hills and valleys are a part of our heritage; please protect them.
The costs and negative health and environmental impacts that hydraulic fracturing (the ultimate purpose of the majority of this sand mining) will cause should be weighed against any short-term economic benefits to our state/region. We will all have to pay for the destruction of our environment, and it would be better to start sooner than later by considering the full range of impacts that the promotion of industrial sand mining in Wisconsin will have on our nation and the world.
climate change, the sixth extinction
Every single plant, animal, human and insect deserve to duely considered as to the negative impacts these sand mines would have on their lives. We do not need more oil, we need alternative fuel sources. Instead of polluting the Enviroment, let us create far more jobs through alternative resources and alternative fuel sources. WI will be all the better for it. And as an added bonus, investing in ecologically effective alternative fuel sources will give WI a Economical boost as well, as we can then work to help other states do the same (while getting a financial boost from doing it).
Please consider protecting existing jobs, health, homes, and natural resources. The driftless area is rare, unique, beautiful, and attractive to tourists who want to hike the bluffs, boat the rivers, fish the trout streams, and enjoy the small towns and farms along the way. Sand mining threatens to make a permanent end to that. Sand mining threatens to take a chunk of the homeowner's biggest asset -- their homes -- and leave longtime residents with chronic health problems, lower quality water, and a scarred landscape.
The loss of property value to the people that live in close proximity - how much do people lose due the sand mines locating in their neighborhood. We are being told that there is no property value loss, which is not true and creates a distrust factor and makes the local people angry.
The topics you have listed cover my concerns. I believe sand mining operations need more strict regulations and there should be careful limitations placed on how many new sand mines can be created. The decisions made now are absolutely critical for future of the state of Wisconsin. We should not let short-sighted monetary gains cloud our perspective. We need to preserve Wisconsin for future generations.
relationship of county zoning laws to village, city standards
Payments made by frac sand industry to public officials at the state and local levels. Environmental, health, and safety impacts (as per previous) in jurisdictions with agreements or ordinances regulating sand mining versus those without.
I'm very concerned about very long range impact on the water table.
To residents
I think y'all should look into past mines that each mining interest has been involved with to see if they're really good neighbors and good stewards of the environment, or if their record speaks otherwise...
These frack sand mining companies come to small towns and seemingly corner the residents into jobs that will provide them a way to feed their families, in exchange for destroying their own towns, property value and air and water quality.There needs to be more education on the dangers of this type of mining so that the residents are aware of both sides.There should also be another alternative... jobs are not created through destruction. Green jobs are what we need.
To the people of the area it is all risk and no rewards. They did not move there because they had a nice sand mining operation in the neighborhood. Sand mining has no benefit to the common good. Wouldn't it be more desirable to be part of a clean energy source like wind ,solar, or biofuels as opposed to contributing to the dead end ,high polluting fossil fuel industry. When the playing field is made level for all energy sources , alternative forms of energy will prevail. Let's be proactive DNR, as opposed to being complicit to a deadend form of energy.
There have been many studies done that point out health issues that mining sand causes. But it seems the DNR cares more about money for a few than the health of those who live in the area around the mining!
There needs to be a focus on sand mines impact to neighbors and the surrounding landscape. I could mine sand on my farm but I choose not to because I don't want to endanger my air, water, or affect my way of life by changing the landscape around me. I expect rules to be in place so the neighbors can't mine and affect me in any of these ways. Mainly in setbacks, buffers, berms, tree and ground cover plantings, etc...what are the ways to set up a mine to minimize local impact? It can't be all about the person who wants to mine, it has to be about all in the area and impact to everyone. That needs to be understood and studied. How many mines can be in one area and not impact all these things? Should there be a county or area limit on number of working mines or acres open to mining?
We should be using solar and wind power, not fracking. save the sand for roads!

Impacts on trout fishing economy of western Wisconsin. See http://www.fishhabitat.org/sites/default/files/partnership_uploads/TUImpact-Final.pdfImpacts on local/regional food economy. Seehttp://www.cias.wisc.edu/wp-content/uploads/2010/09/driftless090210web.pdf
Closing all frac sand operations.
I am concerned that we have demanded 1/4 of our state when this is all done.
Please consider the cuts to the DNR currently proposed. Decreasing personnel, particularly to those involved in scientific research and taking away their power to deal with regulating environmental concerns that will affect Wisconsin for centuries to come is devastating.
When will the DNR stop permitting new mines? When all the suitable sand is gone? When every last hillside and field is mined? This report does not address the sustainability of mining our state's sand. When will it stop? Is the amount of sand to be mined only tied to market conditions? Is this just another boom and bust economy? What limits are there to this type of mining, or do we as taxpayers and state resident's once again let corporations take what they want as long as they want and we are stuck with the impacts and cleanup?
No more new frac sands mines in Wisconsin.
How has geological stability of bluffs been affected by mining
Do EAs to assure compliance with state and federal regulations is had.When's the last time concern was really had in regards the social economics, environmental aspects and cultural sensitivity for those who call this place home, has been addressed.The state assumes regulatory responsibilities from federal agencies, yet totally drops the ball when regulation needs to take place. At one time it was thought, states knew their back yard better than the Federal agencies, and thus should regulate over their jurisdiction. Now days, well this doesn't really seem to be the case at all.. Maybe it's time to discuss having the federal agencies re-assume such jurisdiction..
Possible impacts to threatened and endangered species due to noise, pollution, and habitat disturbance.
You do what you want to do anyway ... You need to listen to people but you don't some day we are going to be out of water... Quote A lady I knew whom died at 100 years of age said her father told her that some day water was going to not be here. We are heading down that path already.. You need to stop regulate this now look at all the irrigation & the water it takes to wash this sand What a shame.
https://stateimpact.npr.org/texas/2013/08/27/new-study-finds-another-link-between-drilling-and-earthquakes/although this article relates to oil drilling I do believe it is worth considering.
Items 11 -16 should only be analyzed in regard to the environment and the effects they have on the living things within the environment. Local, county and state governments should be analyzing the remainder. For example, a bridge's ton limits was raised from 10 to 45, simply by applying stickers over the number 10. A situation like this should not be a matter for the DNR but rather the local government.
Look at reasons why other states have started banning sand mines and fracking. Compare wind power to fracking.
DNR shouldn't have an open for business mantra. They should be an agency that protects the environment for the long term benefit of the state of WI and it's residents, both present and future, regardless of how it impacts big industries bottom dollar.
I think they should e more closely regulated
Limit the number of mines. You limit the number of deer, bear, turkeys, pheasants, etc. that can be taken to insure everyone can enjoy them into the future. How are the hills and valleys different? How will we explain to future generations why we tore the landscape apart so that oil and gas could be extracted at full bore with greed run amuck. Require environmental studies for every mine. JUST SAY NO IF ITS THE RIGHT THING TO DO.
I have nothing more to offer.
with farms and farmers, having already contaminated 12% of the drinking wells in wisconsin with nitrates, and 33% with pesticides, I think it is time for some of our agricultural lands to switch to mining and give the land and our water time to rest.
I hope the DNR will do research and also study relevant documents that already exist in the scientific community, and the personal testimonies of citizens affected by mining. Mountaintop removal coal mining in the eastern U.S. has reports of environment pollution and destruction of local economies. Boom and bust is usually the story of communities affected by mining.
As long as business is complying with laws of the county and state and participating in the betterment of society as a whole, so be it.
Dam Safety and Floodplain concerns as well as interference with managed forest land and farmland preservation should be addressed as well. Shoreland zoning should be mentioned too. I also didn't see where threatened and Endandered species fit in either.
The DNR needs to respond more quickly to citizen complaints. The dnr needs to act on the side of the public, not industry. The dnr needs to act as stewards of the land instead of paying lip service and allowing industry to run rampant.
Groundwater available for consumption should be paramount: the costs associated with repair of polluted water and repair of wetlands is not borne by the industry properly. Furthermore, this process of allowing 'cheap abundant oil' is perpetuating use of fossil fuels, and endangering life on earth for the entire planet. All this cheap fuel would bother me if we were using it to get to the next stage - a different but ecologically safe energy source. Alas, we allow business and dollars and 401k's/stockholders dictate the future. So government has to govern for the long term and rich and poor alike.
The probable lifespan of fracking is short, so Wisconsin will suffer a lot of degradation for a short-term gain for a small number of already-wealthy people.http://fortune.com/2015/01/09/oil-prices-shale-fracking/

Why don't you just call it Fracking? Everyone knows fracking is BAD for every environmental issue you have identified in this survey. And, you can add to the 'bad list' the additional issues that other survey participants identify.
Once this information is compiled, I would like it to be openly shared via newspapers, television, etc. And put into layman's terms with scientific analysis of harm or no harm to the environment and quality of life due to sand mining. All I see know is lots of data but no one is interpreting what it means to those of us who live in the vicinity of sand mines.
Examine and if necessary, revise standards for accuracy and timeliness in evaluating and monitoring frac sand mines.Realistically assess the capability of the DNR to monitor the state's sand mining facilities in an accurate, timely fashion given the current staffing and budget allocated to these tasks.If accuracy or timeliness do not meet standards, develop a plan for addressing these gaps. How many people are necessary to evaluate potential facilities and and monitor current facilities?
I am certain that short term growth of sand with the promise of big money and jobs is blinding the guidance of what WI needs, long term lower enviromental impact business creation. Tourism has been the foundation of WI along with the beauty of our natural resources. What will the state look like when we trade tourism for sand? Historically frac sand mining has followed a path from east to west moving quickly as problems, regulation, and cheaper opportunities arise. Are we trading our resources for short term gains by out of state corporations? What remains after sand leaves? How will taxpayers be affected today and long term? What will property values be long term? How are landowners compensated for decreased values? The development of sand has outpaced WI government prepardness intentionally, isn't time to upright our ship? Minnesota did.
What is the total cost in tax dollars of reviewing plans, issuing permits, monitoring, reclaiming damaged lands, cleaning up spills, repairing roads, responding to complaints, etc?Who owns the mines? Are the true owners foreign corporations or are they locally owned?
The growth of the industrial sand mining industry in western Wisconsin is perhaps one of the most significant land use changes we have experienced in the last 50 years. Most of the issues are localized and therefore best dressed by local units of government. Although the Cooks Valley case increased the complexity of permitting and approval, the changes are certainly not insurmountable nor have they resulted in a downturn in the establishment of new mining sites. Creating clear standards relating to air quality and water resources should be the top priority of our state officials
Stop these mines and processing plants before our environment is destroyed.
The natural beauty of the land and the welfare of the people!Especially the people who own homes around the purposed sand mine! If they want to build sand mines, go buy land somewhere that is fit for the situation,like a desert.
Many of us grew up in the Driftless area of Wisconsin, followed our parents and grandparents, acknowledging its unique beauty and peaceful living. Many are veterans of war, having fought for freedoms we enjoy daily, veterans who purposefully chose this area to live out their lives. Now Big Oil wants our resources and will do everything/anything to keep its costs low and ensure that those resources are procured. Watch for legislative changes that eliminate local control and protections, watch for regulatory efforts and decisions getting flipped somehow at the expense of local owners and residents. How will our generation be remembered? The ones who destroyed the last shire in the world?
Keep the rural areas of Wisconsin, RURAL, and only for agriculture. Otherwise spreading them far apart, like every five or ten miles would help relieve the burdens this industry creates.They never should have been allowed in, or allowed to be so close to one another. Rules are rules for reasons. Make such rules.
Please include the Lake Pepin Partners in Preservation Economic Impact Study--contact William Mavity in Stockholm, WI for more info.
Perhaps an analysis methodology more than topics :1) What other parts of the world might have data that might contribute to our air quality concerns. For example are there windblown parts of the world that have regular dust problems and we might be able to learn of long term health issues or for that matter, non-issues. 2) I presume that the DNR will include numerous health science professionals in the air quality topic, and leverage lots of history that must be available/applicable.3) Are there any correlations to the sand mining air quality perceived issues, and other industry air quality issues/exposures.....other kinds of mining of other ores, that could be somehow correlated to historical lung or skin or allergy or blood issues ....someway to have comparative exposures.
Indusrial sand mines would need to be regulated and very closely monitored. This will take many hours of time and be a large cost in dollars.
How much of our resources should be reserved for future generations.
Local control regarding mines. It should be up to the town, village, or city.
Please do extensive interviews with affected neighbors and address their concerns! Study the divisions in communities that this industry creates.What industries are incompatible with sand mining?Determine how many more regulators are needed to ensure this industry is operating responsibly. Study the hydraulic fracturing industry and its long-term viability. If this industry collapses, so does the frac sand mining industry.
Please review Trempealeau County's comprehensive report on the health issues associated with industrial sand mining. I applaud the DNR for authorizing this much-needed study, but I am worried that the State will use budget and funding concerns to prevent the DNR from conducting a meaningful study.
My major concerns:cumulative impactsquality of life for residents living near the facilities are current air standards sufficient for cluster mining?ways to limit noise and light/ land use conflictsprotecting the quality and quantity of the surface and groundwater
community control, not corporate control - keep corporate $ out of decision making process

Please consider the accumulative impact of many CAFOs and the sand mines, economically, environmentally, and sociologically. Large industrial facilities in the rural area have changed the self sufficiency and lifestyle of many rural citizens.
Should be treated fairly as other business are with rules and laws
I should remind you of the Wisconsin Department of Natural Resource's Mission Statement:To protect and enhance our natural resources:our air, land and water;our wildlife, fish and forestsand the ecosystems that sustain all life.To provide a healthy, sustainable environmentand a full range of outdoor opportunities.To ensure the right of all peopleto use and enjoy these resourcesin their work and leisure.To work with peopleto understand each other's viewsand to carry out the public will.And in this partnershipconsider the futureand generations to follow.Nowhere can this statement be interpreted to allow for any compromise to the health of our natural resources. A true study of frac sand mining can in no way align with the WDNRs mission to provide a healthy, sustainable environment.
There is a lack of local decision-making authority and an all-around lack of accurate information on the impact of frac sand mines on the local communities. DNR's role is over seeing Wisconsin's natural resources; mining activities negatively impact soil, water, air, habitat, and wildlife resources and DNR has a lack of staff (and direction) to provide the necessary monitoring and oversight. relevant doc's http://www.ewg.org/research/danger-in-the-airhttp://www.ncbi.nlm.nih.gov/pmc/articles/PMC3683189/http://www.crawfordstewardshipproject.org/download/The Rapid Industrialization of Frac Sand.pdfhttp://www.crawfordstewardshipproject.org/download/Environmental Impacts of Aggregate and Stone Mining.pdfhttp://www.crawfordstewardshipproject.org/download/Groundwater and industrial sand mining.pdfhttp://www.crawfordstewardshipproject.org/download/Tools to Assist Local Governments in Planning for and Regulating Silica Sand Projects.pdfhttp://scienceblogs.com/thepumphandle/2012/06/14/frack-sand-mining-boom-silica-dust-air-quality-and-human-health/http://www.crawfordstewardshipproject.org/download/UWEX Sand Mine Economics.pdf
I think it is important to consider the end use of this product - supporting the hydraulic fracturing of oil and gas. To reduce global warming carbon emissions, we need to leave oil and gas in the ground, not support its extraction.
Its toxicity to all life forms.
THE PUBLIC
The frenzy to drill everywhere for gas and oil is already in a bust cycle and may never recover. Drilling for oil and gas in more and more difficult areas for less and less oil and gas from every hole is rapidly increasing the cost and reducing the yield. The damage directly from the sand mining, drilling and use of fossil fuels is extremely long lasting.
Please consider how many bad things are happening to our beautiful area of Wisconsin that has been taken over by people who don't live here or care about us.
Sinkholes and deforestation
Please listen to our State Geologists, Natural Resource Scientists, and Health Experts, as they express their concerns, and present the facts. Also, look outside of the box , meaning other states. There has been an increase in earthquake activity, why? And, who is it really, that is profiting from Silica sand mining? Our States Natural Resources Future, is relying on you, to make the right decisions. Remember, once it's gone....It's Gone!
Please do a complete and through analysis to fully answer all urgent concerns,the public has about the health and safety of such sand mines and any and allimpacts on nearby neighbors.
I think the DNR needs to consider how the sand mining is affecting the wildlife with the lights and noise all night and how it might affect erosion because of the stripped land.
We just don't need what's coming out of the ground....with the methods being used, especially.STOP THE GREEDY BASTARDS WHO PUT PROFIT ABOVE NATURE, PEOPLE, AND COMMON SENSE.
Why is Scott Walker funding studies to look at the health effects of wind power while turning a blind eye to dirty energy sources such as coal, fracking, etc?
Wisconsin is a treasure, please don't desecrate her to feed the the money machines. May wisdom and integrity rule your judgement. There is honor in saving our sacred land.please look into the railroads shoddy transportation
I love Wisconsin. Our clean water is one of the greatest resources we have. Why would we jeopardize that resource by allowing sand mining near or on rivers and lakes? We need to make a cost/benefit analysis of the sand mining and the tourist industry. The tourist industry can always get better but the mining of sand is just until they are done. Once they are done mining, the tourist industry is done too and cannot get back to what it was. We need to look at the long term of sand mining and the consequences of that mining. Sand mining is a short term goal with long term implications. Ask the mining company how long they will be doing this. The price of restoring nature after they are gone is incalculable because nature can only restore itself. Once nature is assaulted by man, it is never the same.
I don't think I have said anything in my input that won't be said many times over.I do know that it is about time that the DNR did this analysis. I just hope the results won't be sugarcoated or repressed. We all know that yes, there are many serious issues with the frac sand mining industry, and it is about time that the cumulative affect was considered. Glad you are taking the time to do this -- please do it right!
I thank the DNR for its commitment to ensuring the safety and protection of Wisconsin's and natural resources--after all, they're second to NONE :)...and worth protecting for all life to enjoy for generations to come.

As part of the economic analysis, include the seasonality and flicker of these jobs and the impacts on local economies as the seasons and markets change. Address the bonding loophole in the State statutes for reclamation bonds, which was discussed on public radio in Summer 2014. In short, the 2012 study had a lot of qualitative information that is not very measurable or is conjecture. It also did not consider the cumulative impacts of these operations on communities, natural systems, the local economy, and the quality of life of neighbors. The strategic analysis should be based on empirical, hard data with evidence. It needs to be comprehensive and must include the human element. As NR150 suggests, it should consider the direct, indirect, secondary, or cumulative change to the quality of the human environment, including aesthetic, historic, cultural, economic, social, and human healthâ˜related components. I would also love to see more opportunities for public input as the study is developed in a different format that does not threatens to time out while you are thinking about your responses.Thank you the opportunity to comment. Forward Wisconsin,Nancy
I can only quote Mark Twain. A mine is a hole in the ground with a liar standing beside it.
I wish you would pay. More attention to the work of Dr. Crispin Pierce from UW-EC.
What impact does a frac sand mine and its lines of transportation adjacent land value, assuming the adjacent land will never be used for a frac sand mining purpose?Who needs to be notified of blast? How far in advance should they be told of blast? And what mode of communication prior to blasting is best? For example, should all land owners within 5 miles of blast get written notice of blasting at least 1 week in advance? Or would a different distance and/or form of communication and/or time prior to blast be better?What limits on blasting force and frequency need to be enforced to prevent damage to homes and other structures?
I personally believe that the major function of the DNR is to protect and enhance our forests and water resources and the wildlife and people that inhabit them. A few years ago the DNR would not be asking me what they should look into when a huge mining industry was invading the natural world. They would be leading the charge.
I wish I'd had time to gather all of the links and make reference to all of the people who have reported the negative effects of this type of mining. I do hope you'll do your job and look closely at the negative health benefits of this.
Night sky light pollution!!!Also the noise pollution from the trains!
Nothing more, just can't wait for my children to graduate from school and then my wife and I are out of this area for good. Just hope the detrimental health effects of mining haven't given us terminal illnesses by then.
That provide jobs in our area, but need to put the land back when done.
As oil prices remain low, I'd love to see sand operations suspended while we shift toward greener technologies. Now is the time. We can put our resources and efforts toward cleaner sources of energy. Why wait for the next political or environmental disaster?
Land annexation miles outside city limits is wrong for the farmers, city people, and the townships. How often does the DNR inspect the mines? Is the DNR staffed to even do so?
Virtually no one can afford to bring and maintain suits regarding the effects of airborn silica, damaged wells, vibration, noise, etc. the wine is the only body neighbors can look to for protection
I am not much help in this but I feel that the sand operations have made a big economic impact in my area. the environmental aspects need to be checked so mother nature is not harmed. The traffic is a small side effect of the economic gain that has been provided by the mining. We all need to do things to improve the economy in our area.
Population is not going to grow because I know I don't want to stay in this area with all the unknowns relating to air and water quality. Why should my family be the guinea pigs for this industry? Too many mines in such a small area
The sand plant in Menomonie has been pretty responsible and a good neighbor but I do worry about any side affects.
Lack of obeying permits and laws
I think more research needs to be done we need to have very specific rues in regards to the regulation of the industry and they need to be monitored for these infractions I realize that there are very few Dnr employees in comparison to the umber of mines so we need to figure out a way to budget for these perhaps the companies should have to pay for there own regulation seems to make sense with the money they make they should be able to afford it after all it is a privilege not a right
Many of the holes drilled to test the sand where never filled in. My parents well water has been polluted and the foundation of there house is cracking more and more with every blast. Something needs to be done about this.
Please evaluate the degree to which mines actually affect employment opportunities (quantity and quality) for local residents.
All the questions I asked on this survey were questions that were asked when sand mining was first proposed in this area. I am still waiting for the answers!
Most of the sand mines are doing a great job. Of course like with anything there is always a bad apple. Continue to regulate and monitor them but don't shut them down. It's not such a bad thing and they truly have given a lot of local people work which eventually trickles down to all the local people when money is being spent in the community
When the actual hydraulic fracturing takes place in extracting the oil, natural gas, or liquid natural gas from the site, it is done so far below ground and perhaps up to a mile or two from the well shaft entrance into the ground that it doesn't cause damage to the water or air quality. It is also several hundred feet below the water table, and the pipes are cemented in place as the drilling process takes place.When people refer to it as frac sand, I think people have fear that the fracking process which uses water/sand/and chemicals takes place at the sand mine. Perhaps better education would be of benefit. Successful sand mining companies could be helpful if they would advertise tours on a regular basis that are open to the public. Fear of the unknown is the cause of the most resistance.

Sand mining is regulated enought some people will never be happy with sand mining it is good for Wisconsin
Please involve Crispin Pierce and his crew at UW Eau Claire in your evaluation of fugitive dust around frac mines.
Local control is very important. I believe the state can set minimum standards and allow local communities to restrict FSM operations further as they see fit. The state should not usurp the power of the local entities to control how we live, but rather should provide a minimum level of environmental standards to protect the whole state from out-of-control FSM companies.
I think we need to think about the future and what we will look like in 30 which is really a very short time. Do we want to have clean air and water? Do we want to have a healthy Eco system? Do you trust big money from out of state to protect us?
If you enjoy this state as i have my entire life industrial sand mining can have no part in our future. There is no way this type of mining and the lives we have come to love can coexist.
We need to be energy independent
I wanted to put a well in at a property I own but the end denied my request because it was an old abandons dump site but they let all these sandmines in just because they have tons of money. Just sad.
https://www.eqb.state.mn.us/sites/default/files/documents/23.%20March%20Final%20Silica%20Sand%20report.pdf
One of the great things about our state is our natural resources, and it's beauty. Mining is going to use up a great deal of these resources, and destroy the beauty.
Too many mines and processing facilities are being put up in too small of areas. Land between Chetek and New Auburn WI. are saturated and yet they continue to build more along highway SS which in turn is destroying habitat for the wildlife.
We want science that shows if they are good or bad.If ther is proof when things are asked or said then we could prove truth or lies. I think alot of the public is misinformed because people will lie to get ther way.
Only those in the pockets of these companies would vote to continue to destroy our state.
PLEASE DO NOT ALLOW ANY MORE SAND MINES TO MOVE TO THE TREMPEALEAU/JACKSON COUNTIES AREA.
Again, I am not a professional who knows the literature in the field. I am an ordinary citizen who has to put up with having a sand plant 4 miles away with nothing to block it. Thank you.
This industry will need to externalize more of its costs to remain viable as the market changes.
There should be no sand mining in Wisconsin.
I have no problem with it as long as it's in a isolated area like Bager Mineing in Taylor, WI.
If an error is to be made, error in favor of the mining company.
Make the information of all sites visual in pictures. All testing and facts displayed. What problems sites encounter. Workers health updates and safety measures for personal and environmental statistics. What moneys it produces and who gets it, what money the site looses and who foots the lose. And photos after the site closes. Who is responsible to clean site up and try to restore it back to as close to natural as it can be. Which I feel should be the sand mine companies responsibility. Much needed documentation visual and in written terms the average person can understand. All made public and on display at court houses and the such.
Please save....our state....the money makers will be gone....we will be left with the results....
Reclamation bonds.
I would like to see stronger fines better follow up from DNR, and stricter rules. The rules a farmer would have to follow are much more severe than what a mine needs to follow.
No, it's simple! I just live here! My family and I are vested in Wisconsin and I don't feel the mining companies are. I want to stay and raise my family here, but not at the risk of unhealthy air and water.
Please consider limiting the number of sand mines in Wisconsin. Please consider the average person who has to put up with the noise, the blight, and the pollution which result from sand mining.
Would like to know haw this is impacting farm animals near mines / rails.
My concern is the rapid expansion of a large land devastating industry that is being sold to local government as a tax cash cow. Chippewa County sold off their rights and the impact is huge on the adjacent township. We have a 1700 sand mining operation with a processing plant and a rail spur. This in within a mile of my land. We live in Dunn County that is more restricted in permitting sand mines but this large mine is on the western edge of Chippewas County. The explosion of sand mines is crazy and needs to stop.
Insure funding DNR to allow adequate enforcement of law.
-
I think the DNR should as a whole consider the fact that companies whose stated goal is the depletion of natural resources do not have a great track record of rectifying the damage caused by their search for profits. They will profit and then move on leaving our landscape, both physically and culturally, forever changed.

Research to date:WDNR published report January 2012, Silica Sand Mining in Wisconsin, Does not include:â€¢A technical analysis of the potential cumulative impacts on groundwater.â€¢Data on anionic acryl amides in Ground water (the chemical used as flocculants in the water recycling steps for sand processing).â€¢Baseline: Static Water Quality Levels (lead, turbidity, suspended solids, chlorides)Does suggest:Ground Water (5.2.1 page 21 DNR)Dewatering of Private wellsâ€¢If mine is below ground level(5.2.1.3)â€¢High capacity wells may result in 10- 95% water loss (Page 22 DNR)Ï§Cone of depressionï,§Water quality subject to changeDischarge to surface and ground water (DNR 5.2.2) â€¢Change in ground water levels,â€¢Reduce spring volume that could have thermal impact on streams. 5.3(page 29) and could cause coldwater tolerant species of fish and invertebrates to disappear. 5.3(page 29)â€¢Warm ground waterâ€¢Physically altering local hydrology drain patterns, oHolding ponds 10-25 year rain can wash silt sand gravel to surface waterodischarge of small particulates not included in TSS analysis can cause significant tributary issuesoStorm water run off (5.2.4)Though wetlands will be avoided 'If Possible', but can be permitted if demonstrate they cannot be avoided.Loss of Wetlands (5.2.3)â€¢Altering local hydrology drain patternsâ€¢Change ground water levels
The health (sand particulate) danger and damage will show up in years to come.The safety factor (train derailments and unsafe truck drivers) will take their toll also.
Mining companies should post large bonds and carry a significant amount of insurance for each mining operation. Townships and counties should be protected from default by the mining companies.
Most important is the long term effects of Sand mining in this area. What will be left?Another deserted area like the copper mines in the West? Or an area like the open pit iron mines? These mines could destroy this whole area for the capitol gain of Texas oil men.
It's time that industry quit raping/ruining the land.
We need more people monitoring this properly and not under the direction of a leader appointed by our Governor whom has his own personal agenda.
You will get overwhelmed by the anti-sand zealots. Their group is organized, and expect much duplication. Most people by far are in favor of this industry, they simply do not speak. Again, I do not own sand or work for the industry, but I am pragmatic enough to see the great value this industry has brought to the entire area with actually very little negative.
Sand mining and processing utilize significant amounts of groundwater, usually requiring high-capacity wells (a well with a pump capacity of 70 or more gallons per minute). Water is used to clean and sort the sand, as well as for dust control. Expected average water use ranges from 420,500 gallons to 2 million gallons per day. The effects of groundwater pumping are specific to the local hydrogeology and proximity to surface waters.Groundwater contamination is a possibility once topsoil is removed to access the sand. Topsoil is a natural filter and is often found within layers of the limestone common in these frac sand mining areas. Because limestone is porous, it can lead to sinkholes and fissures that allow polluted runoff to directly tunnel into the groundwater. Without any of the natural filtering that would normally occur, drinking water is put at risk.Around-the-clock noise from equipment operation and blasting can drive wildlife away from mining areas. This results in disrupted reproduction for the wildlife and loss of quality hunting, trapping, and nature study opportunities for us. In addition, increased silt or other pollution entering nearby surface waters can lead to impaired aquatic habitat and fish kills.The increase in frac sand mines across Wisconsin has led to a decreased quality of life for many citizens. Among the biggest complaints are the noise and road deterioration caused by increased truck traffic. Light disturbance is another issue because mining operations are permitted to run all night. Don't let their HIGH DOLLAR Lawyers push everything under the rug.
In Jackson County, a foreign company (Uniman) literally wrote their own law on how they are to be regulated in the Township of Hixton. Does that seem right? That's messed up.
Make sure the rail lines are safe. Increase crossing safety Work on noise reduction in some areas. This can be a great thing for west central Wisconsin and the State. You need to think Think Think THANKS
n/a
I would like to see an honest estimate of how long this industry will be in WI. We never talk about if this is going to be a long term partnership or a short term cash grab (from both sides). We have not had enough long term discussion on what sand mining means to our state.
I can't think of any additional at this time.
In the current political climate of WI I am not optimistic that our State or the DNR will address any of these issues. The permitting process is a joke-rubberstamping the mine company's plan. We have enough of these plants, there should be a moratorium on further construction.
Ownership of mines must be a consideration also. Out of state, giant corporations and small fly by night operations should be carefully scrutinized before being permitted.There should also be a limit to the number of permits that will be allowed in WI so that those of us who love this land and our life here will know that we will not be taken over by these mines.
Consider the economic benefit for the entire community..Wisconsin industrial sand mining is compatible with all other surrounding rural land uses -http://www.uwsp.edu/cnr-ap/clue/Documents/Mining/FracSand2.pdfThese resources need to be protected for the future to reduce our dependence on foreign oil.
The department ought to fill the vacant Conservation Warden positions that were formerly assigned to work specifically environmental crimes and one ought to be assigned to work the chemical pollution of the groundwater and additionally the trout streams and wetland pollution issues. Don't water---do it now.
Gravel pits near housing developments

Unfortunately, the current political system in place in Wisconsin is so skewed pro- mining, and anti-environment in general, I can only hope voters wake up and see what big money from a few multi-billionaires has bought us and future generations in our state.
I believe the DNR needs to be aggressive and pro active. the sand companies have big money and are trying to satisfy their best interests. we need to be prepared so we do not get used and abused and then left to hang out to dry.... please DNR, get on the ball here....
Overall impact of so many large mines in small areas such as the Bloomer/New Auburn area and the cumulative effects
The economic costs for those who will be unable to sell their property once the mining company comes in and strips the land near individual property. Please take a drive through the County H and M areas near Fairchild if you are not sure what I am talking about!
Consider the jobs. Consider the workers. Consider the neighbors. I believe the sand companies can be good neighbors....if they put there money where it counts.
Merely because someone owns land does not mean they can do whatever they want with it, such as begin sand mining. The DNR needs to more closely monitor the land use issues and the effect it has on the total population, not one farmer or land owner that will sell and move far away from the destruction that comes with the sand mines.
There should be a separate governing body to monitor frac sand mining
Residents within one mile of any sand mining operation should be given the option to sell to the sand company for the market value of their property prior to the sand mine operation. There are so many people who just want to live their life in the peace and beauty of this region who now can't even leave because their property has been devalued through no fault of their own. This is not a Wisconsin value.
I suggest looking closely at what the state of Minnesota has done in regards to sand mining (no sense in re-creating the wheel) re: http://silicasand.mn.gov/They seem to be far ahead of us here in Wisconsin.
I want to know if this is truly making a positive economic impact in the region (Barron, Rusk, Chippewa Counties). What is the cost to the environment and our health? What is the long range cost (pros and cons)? The long-range implications concern me as well - WI is going to be used by out of state interests and will be left behind and abandoned once the businesses have what they want. They won't care about proper restoration. There needs to be real guidance and consequences if they don't follow through. Make fines and fees high enough so that if they don't do as they need to, there is truly enough money there to support someone (or other business) to come in, clean it up, restore it and make it right. These businesses can't get off scott free.
needs to be done safely and correctly but I do believe it can be done. Don't let false information that's been heard enough become reality. Below is a letter I sent in support of mining in my area. Ladies and Gentlemen thank you for this opportunity for hearing my concerns. One major concern that I have that HAS NOT EVEN BEEN ADDRESSED yet is the use of Dihydrogen Monoxide. Dihydrogen monoxide is colorless, odorless, tasteless chemical that kills uncounted thousands of people every year. Most of these deaths are caused by accidental inhalation of DHMO, but the dangers of dihydrogen monoxide do not end there. Prolonged exposure to its solid form causes severe tissue damage. Symptoms of DHMO ingestion can include excessive sweating and urination, possibly a bloated feeling, nausea, vomiting and body electrolyte imbalance. For those who have become dependent, DHMO withdrawal means certain death. Dihydrogen monoxide:Â· Is also known as hydroxyl acid, a major component of acid rainÂ· Contributes to the 'greenhouse effect'Â· May cause severe burnsÂ· Contributes to erosion of our natural landscapeÂ· Accelerates corrosion and rusting of many metalsÂ· May cause electrical failures and decreased effectiveness of automobile brakesÂ· Has been found in excised tumors of terminal cancer patients Quantities of dihydrogen monoxide have been found in every stream, lake and reservoir in America today. But the pollution is global, and the contaminant have been even found in the Antarctic Ice. DHMO has caused millions of dollars of property damage in the Midwest and all over the USA. Despite the danger, dihydrogen monoxide is often used:Â· As an Industrial solvent and coolantÂ· In Nuclear power plantsÂ· In the production of StyrofoamÂ· As a fire retardantÂ· In numerous forms of animal researchÂ· Distribution of pesticidesÂ· Additive to certain 'junk foods' and other food products Even after washing, produce we eat daily remains on the produce and is ingested. This sounds severe enough to me to stop this. However Ladies and Gentlemen, This toxin Dihydrogen Monoxide we are talking about is H20. Congratulation to all of you who wanted to ban the use of water. Di-from the greek work meaning two ; Hydrogen- regarding the hydrogen atom; mono- greek word meaning one; oxide- representing oxygen. This ladies and gentlemen is how information is often twisted with emotions and a play of words. Everything stated earlier is mostly accurate and true in regards of the effects of DHMO, water However, everyone in this room knows of the importance of water. You need to consider each testimony based on the facts, not emotions. You need to realized the that state, DNR, county and townships have regulations in place to overlook the entire project. I do not believe you can deny the application because of testimony based on people emotions. As I went through nearly 8 years of schooling obtaining my Doctorate I was reminded early and often that information needs to be based on Peer Reviewed literature from professionals and professional organization. I had an entire semester class on how to differentiate between peer reviewed reliable information and persuaded non reviewed information. The internet can be a great place to start a search but one needs to go further than that to get proper information. I got the following information about water from the DyHydrogen Monoxide Research Division website, www.dhmo.org. Sure it sounds good and legitimate but its a website put together by someone as a joke. It is not a reliable source at all. I would question information that comes from a blog site, facebook or someones opinion
https://sites.google.com/site/savethebluffs//newsfind here how frac sand mines are not following even minimal rules. We need REAL ENFORCEMENT from the DNR!
More regulations should be put in place and we should put a stop to them in the future. I have heard that they have enough sand of 30 years, whey should we keep destroying Wisconsin?

none at this time.
If it is within the purview of the analysis, it would be helpful to provide local governments with a comprehensive breakdown of items they are responsible for regulating and those items that are regulated at the county or state level. Local governments are often unsure what falls within their legal rights when it comes to regulating frac sand mines. A guide outlining their different powers would help ease pressure on local governments to become experts on frac sand mining regulation.
Air quality and ground water needs more study so we as a state can make better decisions concerning sand mining in the state of Wisconsin.
Many of the people that are complaining the loudest are only complaining because it is in their back yard, and they don't seem to have the ability to grasp the BIG PICTURE. This industry should not be looked at any more than the gravel quarry industry has been or is. I grew up in southwest Wisconsin and every valley had a gravel quarry in it, and these sand mines are no different.
Wisconsin Conservation Congress overwhelmingly passed on a state ballot earlier this month a resolution that states:'The Wisconsin Department of Natural Resources completed a report on silica sand mining in Wisconsin in January 2012. Silica sand mining continues to grow with a strong demand for frac sand. The silica sand mining industry is currently concentrated in West Central Wisconsin with potential to expand to other parts of the state containing deposits of minable sand. The published report does not include a technical analysis of the potential cumulative impacts on open space, groundwater, air quality, soil erosion, or fish and wildlife habitat. The report does not specify a process whereby WDNR will evaluate and consider such cumulative impacts. A study that would include citizen and local official input as well as cumulative short and long term natural resource, transportation and regulatory impacts, property values, tourism and archeological resources should be conducted.''Should the Natural Resources Board and the DNR partner with appropriate state and federal agencies to conduct a comprehensive and independent evaluation of the environmental impacts of silica sand mining in Wisconsin?'In addition, some other comments I have:Using independent researchers with no prior or current work for mining companies.Provide and utilize peer reviewed science and research.Evaluate impacts both individually and cumulatively.Cumulative not only at the site level, but on neighbors, communities, counties, and regions.
no concerns
I hate this industry. I see it as a threat to public health and safety. I do not pay taxes to feel unsafe on the roads, look at ugly piles of sand and equipment, hear noise all day long, and wonder what is now in the water I drink and the air I breathe. At least put a stop to any more land being swallowed up by these greedy people. NO MORE MINES!!!!!!!!!!!
to many in one area should limit and space any new ones till old one closes we do not need any more now I do not trust any thing they say if they think they can drill wells when ever they want and don't think they should be able to use wet land areas at all!
Fracking is an issue that needs to be stopped before irreparable damage is done to our country. One way to stop fracking is to remove the sand that is needed.
i feel a person who the land should have the right to do what he wants . He pays taxes and payments all hes life and it should be hes right to do what he wants with his land. DNR should takes steps to protect land in reason but not stop it.

From: [redacted]
To: DNR OEEA comments
Subject: Comment on Frac Sand Strategic Analysis
Date: Thursday, March 05, 2015 9:59:49 AM

Good Morning-

A fundamental question to entire analysis is:

According to published reports last Fall(2014), the DNR inspects approximately 20% of the operating mines yearly. If this is true, how is it possible for the state to consider permitting more mines when it apparently is impossible to monitor the current number?

[redacted]
Black River Falls, WI

From: [redacted]
To: DNR OEEA comments
Subject: Frac Sand Analysis
Date: Thursday, March 05, 2015 1:53:45 PM

I believe all of the areas are or have been covered in meetings including the economic impact on the local economy, the actual number of local employees-percentage wise at sites, the tax ramifications on local schools, any definitive property devaluation within specified distances from both mine and loadout sites etc.. Is it possible to tax mine properties at their purchase price? Is the legislature receptive to placing a tonnage tax on the extracted sand to provide DNR with funds to adequately inspect, enforce, and provide monitoring equipment to satisfy concerned citizens?

[redacted]

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From: [redacted]
To: DNR OEEA comments
Subject: Frac Sand Comments
Date: Wednesday, March 04, 2015 11:37:16 AM

Dear Chris Willger or to whom it may concern,

This letter is being written because I was not able to attend the meeting held in Mondovi, WI on March 2nd. I hope that all of our questions and concerns will be addressed. As you know the issues are real and are of great concern to the people who live close to these mines.

Here are my concerns among others:
1. Air: Do we have accurate ways to test the dust particles in the air? From my research the dust particles are much smaller than what standard tests are capable of. According to OSHA working with silica is hazardous. How are neighboring homes to protect themselves? How do we protect our animals? If it's not safe to work at the site, what about the surrounding areas?

2. Well depletion- Not only about neighboring wells, but at the site that is trying to go in in my area there is a wetland right across the street. How are wetlands being protected? And how does this type of mining affect these types of habitats.
Well contamination- The Food Safety and Modernization Act requires water testing. If I'm required to have my water tested and my well is contaminated by a source I have no control over, what does this mean for my business? How can I protect myself from a contaminated well?

3. Mine reclamation: Who do we trust? How is it possible to reclaim land that has taken millions of years to create?

I understand, now, that the DNR was not present because they never agreed to be a part of this process. We are citizens who's lives, homes, and businesses are in jeopardy. These are major issues that cannot be dismissed. Frac mining has never happened at this scale, and the concentration of these mines, could spell disaster for innocent citizens. Please hear our voices, we are asking for your help.

Sincerely,

[redacted]

From: [redacted]
To: DNR OEEA comments
Subject: Frac sand scoping process
Date: Tuesday, March 03, 2015 1:09:45 PM

I respectfully, but adamantly, request that the WI DNR start regulating the frac sand industry. A ban would be great or at least requiring an environmental impact statement for a mine!!! The health hazards, water quality/quantity issues, traffic congestion, noise and light pollution, decreased property values, and general removal of our beautiful bluffs, are irreversible problems associated with this industry. The goat prairies on our bluffs are also a fragile ecosystem for our overwintering golden eagle population.

The negative aspects of the frac sand industry require your professional attention on a regular basis. Once we remove our bluffs, they're gone forever!! We must use an ecological approach when dealing with this issue. If we don't, we will suffer the irreversible consequences as stated in this famous quote:

The earth does not belong to man.
Man belongs to the earth.
All things are connected like the blood that unites one family.
Man did not weave the web of life, he is merely a strand in it.
Whatever he does to the web, he does to himself.
Chief Seattle - 1853

Thank you for your time,

[redacted]

From: [redacted]
To: DNR OEEA comments
Cc: "Advocate "
Subject: Frac Sand Strategic Analysis Public Scoping Process
Date: Wednesday, March 04, 2015 10:54:09 PM

To: Chris Willger

A case for requiring a “Fee on every ton of Frac Sand Mined in Wisconsin”:

Frac Sand Mining is and will continue to have a significant impact on Wisconsin Natural Resources and the residences of Wisconsin. The mining of sand alters the land and has a lasting negative impact on plant life and wildlife that had once grew and lived from where the sand is removed. There are many concerns that are being raised:

1. Health impacts of inhaling airborne sand
2. Lack of meaningful air monitoring from sand
3. Frac sand mines use 100,000s to millions of gallons of water every day
4. Runoff from sand mines and its impact on surface and groundwater
5. Potential acid runoff
6. The affect of noise on wildlife and residents
7. Truck traffic and impact on roads
8. 24-hour lighting on wildlife and rural life
9. Concerns about the density of sand mines may lead to cumulative problems with water, wetlands, and wildlife
10. Long-term cumulative negative impact to the landscape
11. Long-term cumulative negative impact on the totality of natural resources in these areas
12. Lack of an effective policy to return these lands to their original state – Companies mining the sand may not be viable companies in the future.

All of these issues and many other potential negative externalities have short-term and long-term financial impact on Wisconsin residences and our natural resources. I recommend that you serious consider these negative impacts in your analysis and consider recommending a fee be placed on each ton of sand mined in Wisconsin.

Regards,

[redacted]

From: [redacted]
To: DNR OEEA comments
Subject: Frac Sand Strategic Analysis Public Scoping Process
Date: Thursday, March 05, 2015 8:32:44 AM

There are many harmful effects of the frac sand process. It is destructive to our land and detrimental to the health or residents. I urge you to charge a fee on each ton of sand mined in Wisconsin.

Sincerely,

[redacted]

From: [redacted]
To: DNR OEEA comments
Subject: Frac Sand Strategic Analysis scoping comments
Date: Sunday, March 01, 2015 3:09:33 PM

Having been involved with industrial sand mining since it came to Eau Claire County and the surrounding area, it has become evident there are glaring unmet needs to protect citizens, welfare, wildlife, water, and air. At the present time there seems to be over 40,000 Wisconsin acres assigned for sand mining, which means over 40,000 acres of lost ag and forestry land.

1. Industrial sand mines are chipping away at wetlands. The concept of mitigation does little good to an area when the effort from one place is put into an area one or two counties (or more) away.
2. Is dewatering and then dumping of ground water for 30 years while machinery digs in a pit below groundwater level been studied adequately when this occurs next to a cranberry business which relies on groundwater for production? These mines are occurring next to small businesses in addition to farms.
3. In speaking to citizens living next to these mines their comments indicate they feel very threatened. The allowance of large mines in close proximity to homes creates a situation where homeowners are beset with multiple problems.
4. Although the DNR is not in charge of blasting, it is necessary to study and consider rock formation surrounding industrial sand mines. When homes tremble 1.75 miles away, children run in fear, domestic animals are spooked, and plumbs of sand rise who knows how many feet in the air, something is wrong. Again, these mines are being placed in very close proximity to homes.
5. Ambient air must be monitored. It is not. Opacity is judged, but nothing beyond that is considered. Because citizens reside next to these mines, monitoring must be done for ambient air right on the mine boundaries and not where the mine might WANT to place monitors. Research on ambient air is sorely lacking.
6. Reclamation is basically a farce. There has been little study as to how to maximize the potential for decent soil once mining an area is over. Filling holes with fines is totally unlike what the layers of soils were. Moving top soil around depletes its fertility, water retention ability, minerals, microbes, fungi... Reclamation standards must be researched and guidelines strengthened.
7. Measuring 2.5pm is critical and needs to be researched. It is not OK to simply have air permits that say the mine will measure only stack emissions and only where 2.5pm is feasible. It is necessary to establish the present of 2.5pm in the ambient air next to the mine.
8. Study acrylimide and resin in water AS THEY ARE USED BY THE mines.
9. Study what is actually in the dredgings at the bottom of lagoons and then establish appropriate waste regulations.
10. Include in the study the extent to which potential violations in industrial sand mining are not followed up on.
11. Study the appropriateness of fines for multi-national and national companies with billions in revenues.
12. Study the impact of constant noise and light on humans and animals. There are documented effects. Again, these mines are being placed in close proximity to homes.
13. Study the presence of silica during industrial sand mining and how it drifts.
14. Study the efficacy of general permits. These mines are all unique

and one needs to question if ANY kind of general permit would be adequate.
15. Study the impacts ancillary services have on the land, water, and citizens. The mines are here. Next comes gas lines and electrical lines. These services take citizens' lands and affect wetlands.
16. The economic impacts never are considered. Citizens are being forced to move without adequate compensation. No tourist comes to the state to see a sand mine. The road and railroad use of heavy loads is problematic.
17. The impacts on animals, both wild and domestic has not been studied. It seems horses are more prone to significant health problems from silica than cows. One mine in Eau Claire County is right in the middle of an Amish settlement.
18. Water concerns include the potential for arsenic poisoning and contamination by exposing certain elements in the rock to air. Water must be protected.

The bottom line is that there have not been safeguards to insure these mines are placed to minimize impact to people, land, and water. Instead they are right in the middle of farms, small towns, and adjacent to homes or businesses. That is where the real problem lies along with regulating them like much smaller gravel pits. Concerns of neighbors are pushed aside and not heard, over and over again.

Minnesota has made great strides in studying the Industrial Sand Mining business. Wisconsin???

In no way should citizens pay for this analysis. If these large industrial sand mines wish to work in Wisconsin it should be up to them to prove they are NOT destroying water, air, human and animal lives, and our land. They should be paying for this analysis.

Thank You.

From: [redacted]
To: DNR OEEA comments
Cc: Tania
Subject: Frac Sand Strategic Analysis scoping comments
Date: Friday, February 27, 2015 11:59:32 AM

Hello:

I am a member of a group called Preserve Waupaca County. We have worked for over two years to prevent an industrial sand mine in our area.
We are an agriculture and recreation area and very worried what this mine will do to our water, air, roads and over all safety of the residents.

We have legally challenged the county's decision to approve the mine because of lack of science...where are the studies that show the water and air will be clean and that noise and light 24 hours a day are not damaging.

Our county shifts the water and air questions directly to the DNR but do they have the man power to monitor the ever increasing challenges to these resources ?

I strongly feel that frac sand mines are a huge threat to Wisconsin because our sand is akin to gold in the fracking process. The rush to remove and haul this sand/gold has created many problems that need to be addressed. A complete study is warranted or we may end up like coal mining states.

Sincerely.
[redacted]

From: [redacted]
To: DNR OEEA comments
Subject: Frac Sand Strategic Analysis scoping comments
Date: Thursday, February 26, 2015 11:38:03 AM

The people of Wisconsin need an aquifer impact study.

Hypothesis: If 3 sandmines, within close proximity of each other, (e.g. Wisconsin Proppants, Smart Sand, & IMIN) each have 5

high capacity wells, running 24 hours a day, then…how far does the water table drop within a a certain time frame?

then… is there a turbitity problem in the immediate area, 1 mile away, 5 miles away?

then… are private & municipal wells going to dry up?

then… who is going to be financially responsible, the sandmines, the general public, the DNR, the hydrologist?

Concerned Citizen,

[redacted]

From: [redacted]
To: DNR OEEA comments
Subject: Frac Sand Strategic Analysis scoping comments
Date: Wednesday, February 25, 2015 11:43:07 AM

DNR, I will be brief….Sandmines: Wisconsin Proppants, Smart Sands, and Enmin (Westar, Shady Glen Road area) are all way too close. The
Cambrian/Ordovician aquifer is in big trouble. With multiple high capacity wells at each site, wells will run dry, including Taylor and Blair.
Thousands of people will have no water or it will be so polluted (turbitity), it will be undrinkable. Badger has 5 high capacity wells, so I
guess the other sandmines will have about the same.

[redacted]

From: [redacted]
To: DNR OEEA comments
Subject: Frac Sand Strategic Analysis scoping comments
Date: Wednesday, February 25, 2015 9:10:16 AM

Sadly, I missed the February meeting in Colfax regarding the EIS you are conducting. I am a resident of Auburn township in Chippewa County and have felt the impacts of this industry and its impacts of my neighbors and friends. In our township we have 4 permitted mines with more expansion possible. I have observed the mining activity surrounding us to the north, south and west and understand a new mining operation is seeking approval to the east (near SS and Hwy 64). The sizes of these operations are mind boggling and are changing the landscape from beautiful hills to industrial wastelands. I living on State Hwy 64 and experience daily the rumble of noisy trucks. Yesterday was exceptionally windy and there is a layer of dust (sand?) over the snow. My neighbors and I experience a layer of dust in our homes and on our cars. In addition to the noise of transporting this product and interruptions to our daily lives I have concerns regarding water, health hazards of crystalline silica, traffic safety and our economy. For me, I chose to sell my home of 18 years which I dearly love, in order to live further away from mining impacts. Sadly, for many here, that is not an option.

Water. State statutes do not adequately protect the quantity or quality of Wisconsin's water. Cumulative effects of water usage should be considered when granting high-capacity wells. In the Town of Auburn our Comprehensive Plan states that the USGS reports the water quality is this area is fragile. With drawdown, water quality degrades which is exacerbated by the removal of vast quantities of filtering sand.

Air Quality. It has been an uphill batter to force these companies to install air quality monitors at their sites. In the case of Superior Silica in Auburn township the developer's agreement calls for only 1 monitor moved around to different sites quarterly where it operates for 24 hours with the results going first to the mine operator before going to our town board. Superior Silica did not agree to installing a monitor on the perimeter of their mine site because they did not want it to pick up dust from their truck traffic (and they so stated at a town meeting). The long-term effects of breathing this polluted air are not known but the dangers to workers with exposure to crystalline silica dust have been studied and these workers should be using respirators. I fear the repercussions for the workers/drivers will be felt in years to come and will far outweigh any economic benefits the workers will have received.

Economy. Our towns are going to go broke. Little tax filters down to the towns as most the the mining equipment is not considered permanent. No one is going to move into this township and build a nice home. Taxes from as few of a couple homes equal what the mines pay.

Traffic Safety. There has been an accident between a motorcyle and a sand truck at US 53 and State Hwy 64 and I fear more are to come. I know I have to wait and dodge sand trucks to get my mail. Accidents and delays at railroad crossings have been document as have trail derailments.

Please consider the citizens' health in this beautiful state we live in.

From: [redacted]
To: DNR OEEA comments
Subject: Frac Sand Strategic Analysis scoping comments
Date: Monday, March 02, 2015 11:58:20 AM
Attachments: WHO REPORT 01.pdf
WHO REPORT 02.pdf
AUTO-IMMUNE DISEASE.pdf
PIERCE-COVERED RAIL CARS 01.pdf
PIERCE-COVERED RAIL CARS 02.pdf

There are valid concerns about respirable frac sand having harmful effects on communities in proximity to both mining and shipping the product.

The most harmful particulates are sized at PM2.5. Particulates this size are so small that they're invisible. PM2.5 are ingested in the lungs and/or mouth, and, small enough to enter the blood stream and lodge in different organs. Sufficient exposure causes disease , sometimes within even a few weeks or months. For example, there is now an open air transloading/processing facility across the street from a school. Because of the proximity and constancy of exposure, and ages of the school children exposed, risk is high for future illnesses.

Communities near mine sites report dust covered cars and windows, and dust in the home if windows are left open.
Residents along rail lines report that even covered cars leave pile of sand along the tracks because the cars have cracks and holes.

Presently, the DNR does not conduct or require industries to monitor for PM2.5.

ATTACHMENTS
Please see an NIH report on auto-immune diseases at http://www.ncbi.nlm.nih.gov/pubmed/10970168. Rheumatoid arthritis is strongly implicated as a result of exposure to respirable silica, other auto-immune illnesses somewhat.

WHO has issued a report about Respirable Particulates by googling "WHO, oehairbornedust3.pdf" section 1.5, 1.6, 1.3.2, 1.3.3, 1.4
This report describes how particulates are ingested and their action in the body. Oral ingestion is even more deadly than nasal ingestion. This means that at a state park which has high bluffs, for example, mining or transport within the contained area would allow PM2.5 to increase in density over time, and be a possible risk, particularly to oral breathers (people performing physical activity---which most do at a state park).

See also attached reports by Dr. Crispin Pierce, UW. An American Cancer Society study shows dramatically increased incidence of lung disease after exposure to PM2.5. Regular transport activity at a frac sand mine site results in a 100% increase of PM2.5 in the air. Transport along rail lines, even with covered cars, results in a 200% increase over normal background. Dr. Pierce has other more detailed studies, studies in progress, and studies pending publication.

Also, please see studies by Dr. Kevin Rudolfo and Dr. Michael McCawley,

A strategic plan for frac sand mining in Wisconsin should not go forward without analysis of public health impacts,

which I believe will be detrimental to many people (especially children and the elderly) and create significant upward pressure on health costs---to say nothing of the suffering and personal loss to individuals affected.

Thank you for your attention to this troubling issue,

[redacted]

Of the particles which fail to deposit in the head, the larger ones will deposit in the tracheobronchial airway region and may later be eliminated by mucociliary clearance (see below) or - if soluble - may enter the body by dissolution. The smaller particles may penetrate to the alveolar region (Figure 1-1), the region where inhaled gases can be absorbed by the blood. In aerodynamic diameter terms, only about 1% of 10-µm particles gets as far as the alveolar region, so 10 µ m is usually considered the practical upper size limit for penetration to this region. Maximum deposition in the alveolar region occurs for particles of approximately 2-µ m aerodynamic diameter. Most particles larger than this have deposited further up the lung. For smaller particles, most deposition mechanisms become less efficient, so deposition is less for particles smaller than 2 µm until it is only about 10-15% at about 0.5 µm. Most of these particles are exhaled again without being deposited. For still smaller particles, diffusion becomes an effective mechanism and deposition probability is higher. Deposition is therefore a minimum at about 0.5 µm.

Figure 1-2 illustrates the size of the difference between nasal and oral breathing, and the role of physical activity on the amount of dust inhaled and deposited in different regions of the respiratory airways. It presents the mass of particles that would be inhaled and deposited in workers exposed continuously, during 8 hours, to an aerosol with a concentration of 1 mg/m^3, a mass median aerodynamic diameter equal to 5.5 µm and a geometric standard deviation equal to 2.3. The calculations were performed using a software developed by INRS (Fabriès, 1993), based on the model developed by a German team (Heyder et al., 1986; Rudolf et al., 1988). Workers' respiratory parameters (tidal volume, Vt, and frequency, f) were associated with their physical activity as follows:

$Vt = 1450\ cm^3$ $f = 15\ min^{-1}$ (moderate physical activity)

$Vt = 2150\ cm^3$ $f = 20\ min^{-1}$ (high physical activity)

The results show very clearly that oral breathing increases dust deposit in the alveolar (gas-exchange) region when compared to nasal breathing, indicating the protective function of the nasal airways. A higher activity can dramatically increase dust deposition in all parts of the respiratory airways.

1.3.2 Bronchiole movement

Intermittent peristaltic movements of the bronchioles, and coughing and sneezing, can propel particles in the mucous lining towards the larynx and beyond.

1.3.3 Phagocytosis

The epithelium of the alveolar region is not ciliated; however, insoluble particles deposited in this area are engulfed by macrophage cells (phagocytes), which can then (1) travel to the ciliated epithelium and then be transported upwards and out of the respiratory system; or (2) remain in the pulmonary space; or (3) enter the lymphatic system. Certain particles, such as silica-containing dusts, are cytotoxic; i.e. they kill the macrophage cells.

Defence or clearance mechanisms for the retention of inhaled insoluble dusts have been broadly classified, based on results of experiments with rats, as (Vincent, 1995):

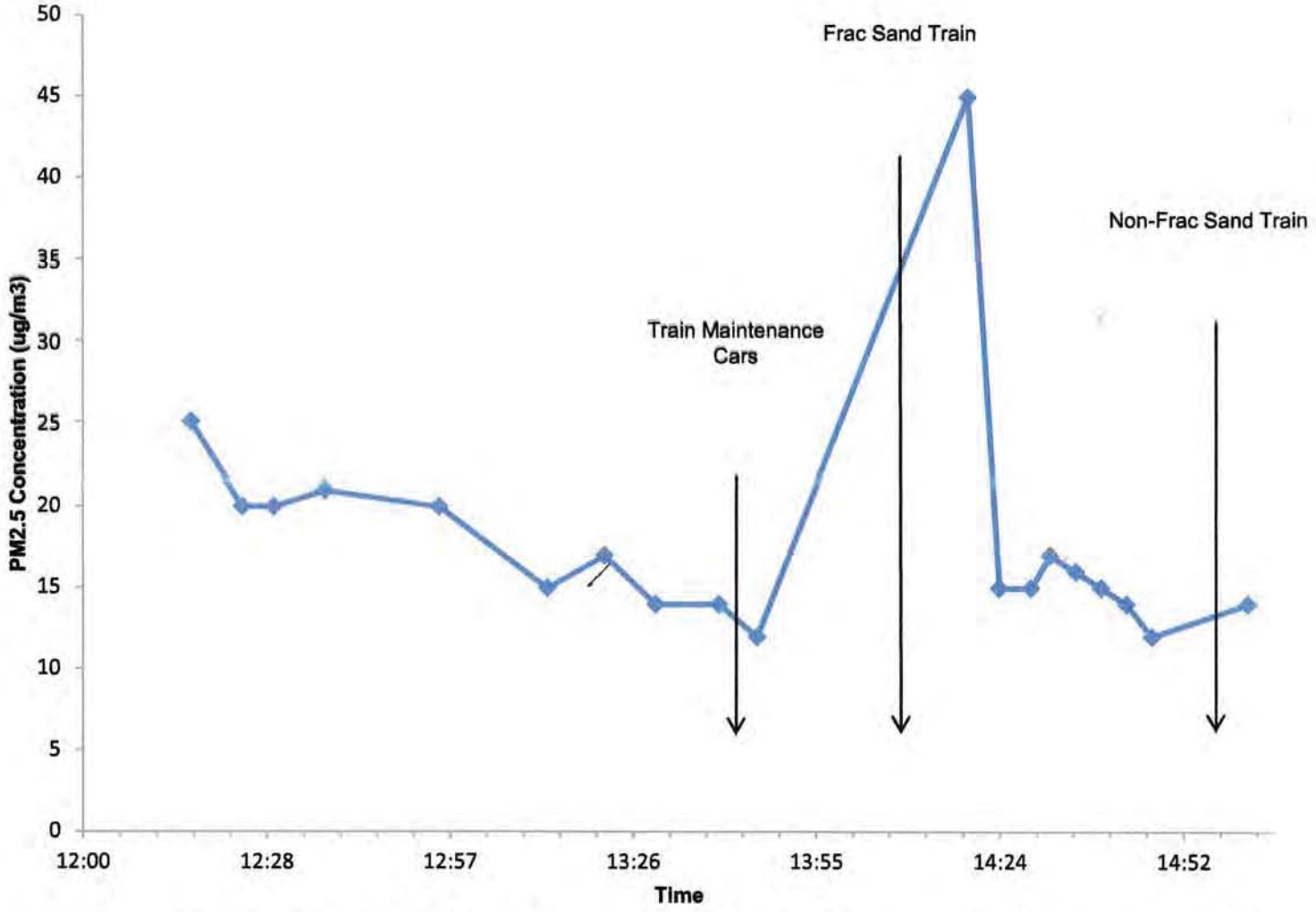
- a *fast-clearing* compartment, linked to the ciliary clearance process in the tracheobronchial region (clearance time of the order of half a day);
- a *medium-clearing* compartment, linked to the "first-phase" macrophage clearance action in the alveolar region (clearance time of the order of 10 days);
- a *slow-clearing* compartment, linked to the "second-phase" macrophage clearance action in the alveolar region (clearance time of the order of 100 -200 days), and,
- a "sequestration" compartment in which particles are stored permanently (e.g.,"embedded" in fixed tissue).

It has also been shown that the accumulation of large enough burdens of insoluble particles in the lungs leads to impaired clearance. This so-called "dust overload" condition may occur as a result of prolonged occupational exposures, even at relatively low levels. Some researchers (e.g., Morrow, 1992) have suggested that such overload may be a precursor to the formation of tumours, even for substances which have previously been regarded as relatively innocuous. With this in mind, some standards-setting bodies (e.g., ACGIH) have revised their documentation for "particulates not otherwise classified" (previously referred to as "nuisance dusts") to take this risk into account.

1.4 Risk to health

Wherever the particles are deposited, either in the head or in the lung, they have the potential to cause harm either locally or subsequently elsewhere in the body. Particles that remain for a long time have increased potential to cause disease. This is why inhaled particles are important in relation to environmental evaluation and control.

PM2.5 Levels Along Rail Line



$PM_{2.5}$ concentrations next to a frac sand rail line with and without train traffic.

DR. C. PIERCE, UW-EC

Initial Measurement

- A single initial set of measurements of airborne particulate level found an elevation of PM2.5 level for about one minute as a train with multiple frac sand cars passed a monitor about 10 m from the rail line.
- No elevation was seen with train maintenance cars before or a non frac-sand train afterwards.

Industrial Sand Mining Public Scoping Comments - 2015

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Environ Health Perspect. 1999 Oct;107 Suppl 5:793-802.

Occupational exposure to crystalline silica and autoimmune disease.

Parks CG[1], Conrad K, Cooper GS.

Author information

Abstract

Occupational exposure to silica dust has been examined as a possible risk factor with respect to several systemic autoimmune diseases, including scleroderma, rheumatoid arthritis, systemic lupus erythematosus, and some of the small vessel vasculitidies with renal involvement (e.g., Wegener granulomatosis). Crystalline silica, or quartz, is an abundant mineral found in sand, rock, and soil. High-level exposure to respirable silica dust can cause chronic inflammation and fibrosis in the lung and other organs. Studies of specific occupational groups with high-level silica exposure (e.g., miners) have shown increased rates of autoimmune diseases compared to the expected rates in the general population. However, some clinic- and population-based studies have not demonstrated an association between silica exposure and risk of autoimmune diseases. This lack of effect may be due to the limited statistical power of these studies to examine this association or because the lower- or moderate-level exposures that may be more common in the general population were not considered. Experimental studies demonstrate that silica can act as an adjuvant to nonspecifically enhance the immune response. This is one mechanism by which silica might be involved in the development of autoimmune diseases. Given that several different autoimmune diseases may be associated with silica dust exposure, silica dust may act to promote or accelerate disease development, requiring some other factor to break immune tolerance or initiate autoimmunity. The specific manifestation of this effect may depend on underlying differences in genetic susceptibility or other environmental exposures.

PMID: 10970168 [PubMed - indexed for MEDLINE] PMCID: PMC1566238 Free PMC Article

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Wisconsin Department of Natural Resources - 130

From: [redacted]
To: DNR OEEA comments
Subject: Frac Sand Strategic Analysis
Date: Tuesday, March 03, 2015 11:54:46 AM

Here are some questions I would like you to investigate in your study:

How does a sand washing facility affect ground water (pollution and depletion of the aquifer)?
Are there long term effects of breathing in the silica sand dust to humans and animals, particularly cows?
How do the sand mines and washing facilities affect the wildlife in the area (deer, birds, turkeys and small game)?
What are the chemicals used in the sand washing process and their long term effects on humans and animals?
How long does the reclamation process take and how will the difference between a "new forest" and the old forest affect wildlife?
According to UW Extension publications, land values decrease around Frac Sand Mines. How does this affect our tax base in the county and thus school funding?
With wells that use high volume 7 days a week and 365 days a year, how does this affect our water tables and water quality?
Will the noise from mining (explosions) and from increased traffic affect our deer population?

I realize these are difficult questions to answer and frac sand mines are relatively new to our state, but I believe it is important to figure out some of these issues before it is too late and our ground water gets depleted and/or polluted, people get sick, animals get sick, and our wonderful wildlife is put in jeopardy. There are a lot of other concerns I have but these are some that maybe you can address in your study.

Thanks [redacted]

From: [redacted]
To: DNR OEEA comments
Subject: Frac Sand
Date: Wednesday, March 04, 2015 7:14:25 AM

Gentlemen,

The Frac Sand industry is disrupting the way of life in our state. Quiet communities are now upset by the numbers of loud trucks traveling through them.

There is a danger of overuse of ground water, a very important natural resource. Wells have gone dry in Sparta, Wisconsin. There are dangerous chemicals forced into the water table by sand mines. These chemicals do not leach out, are carcinogens, and can pollute the water for years to come.

Many of these sand mines do not have the know how to successfully operate and will go out of business before any restoration promises are made.

Please halt the expansion of sand mines in our communities.

Sincerely,

[redacted]

From: [redacted]
To: DNR OEEA comments
Subject: Input Into Strategic Assessment of Frac Sand Mining
Date: Monday, March 16, 2015 10:05:40 AM

Dear WI DNR

Please consider this issue thoroughly and from a citizen and environmental perspective.

I'm sure you have many knowledgeable comments so I'll not repeat some basic concerns but instead ask that you address increased health risks based on the co-presence of silica and high-voltage transmission lines.

Corona is a well-known phenomena created by high-voltage transmission. There is not question of this.

Research has shown that corona from high-voltage power lines can create ionizing particles that drift 400 meters (1300 feet) to up to a kilometer (3280 feet), and a substantive correlation to childhood leukemia and other illnesses when “corona drift” is taken into account. Ionizing particles are thought to attract pollutants that can more readily stay in the lungs. This is an obvious issue in the mining, processing and transporting of silica sand.

A sample of recent relevant research includes:

- Comparisons Of Ground Level Measurements of Ion Concentration and Potential Gradient Upwind and Downwind of HV Power Lines in Corona; Matthews, Buckley, Wright and Henshaw, http://www.sciencedirect.com/science/article/pii/S0304388612000605, provides evidence of corona ion drift downwind of high-voltage transmission lines. August 2012, Journal of Electrostatics, vol 70(4)

- Corona Ion Induced Atmospheric Potential Gradient Perturbations Near High Voltage Power Lines; Matthews, Ward, Keitch and Henshaw, Sept 2010, Elsevier/Atmospheric Environment, http://hep45.hep.colostate.edu/~toki/electrical_enviroment/science-matthews.pdf reaffirms other research documenting corona-induced ion drift and provides a clear summary of the issue:

  1.2. Health concerns near to HV power lines

  Two mechanisms are hypothesised to link corona ion emission with the suggested increased risk in leukaemia found near HV power lines. Firstly, charged aerosols (including pollutants), when inhaled, could have greater chance of remaining in the lung due to electrostatic effects (Henshaw, 2002).

Because:

- health risks are thought to increase in the presence of pollutants and ionizing particles drift up to a kilometer, the DNR strategic assessment regarding the risks of sand mines should identify transmission by voltage within a kilometer (3280 feet) from the mine, processing and transport route. Actions to address the issue are either adherence to a distance minimum of 1 kilometer or substantively tighter controls in silica dust standards when less than 1 Kilometer. The distance minimums and controls are relevant to mining, processing and transport.

- The DNR shares responsibility with the PSC to complete environmental impact statements for high voltage transmission, and the DNR has the authority to provide or withhold permits, such that the DNR is fully aware of existing and plans for new transmission. This also makes it both possible, logical and responsible to assess the increased risk level.

- Corona can increase with water in the air, the DNR should also consider potential impact of bodies of water, irrigation system and use of water in the mining and/or processing so as to minimize health risks.

In closing, we all recognize that technology often outpaces scientific knowledge of determinants of health. But, when a scientific investigation proves that there is a possible risk in doing some activity, as is demonstrated an increased risk of pollutants adhering to the lungs in the presence of high-voltage transmission, then the precautionary principle should be applied. The precautionary principle states that, in cases of serious or irreversible threats to the health of humans or ecosystems,acknowledged scientific uncertainty should not be used as a reason to postpone preventive measures.

This type of due diligence is owed to Wisconsin citizens and communities who look to the DNR to protect their interests.

From: [redacted]
To: DNR OEEA comments
Subject: Public Comment Regarding Frac Sand Mining
Date: Tuesday, March 31, 2015 11:18:10 AM

Hi,

Thank you for the opportunity to voice my opinions concerning frac sand mining.

Our young family left the Twin Cities and chose a simpler life in rural Wisconsin so that we could raise our children with a stronger connection to the land and live in a healthier environment. We fell in love with the rolling hills and streams around Prairie Farm. That was nearly 10 years ago and it's looking different now- with a growing group of frac sand mines nearby and a governor who's declared Wisconsin "open for business". I was not an active environmentalist before the frac sand mines came in. The scope of this issue and a lack of information made me feel I had to become involved.

The appearance of conflicts of interest has eroded my confidence about due process, regulations and enforcements being applied to the frac sand industry. For example, when I first started paying attention to local frac sand mining I was dealing with a county employee who was handling sand mine reclamation permits. Less than a year later I saw her name on the list of employees at a local frac sand mine. The county has since enacted some stronger wording governing conflicts of interest for their employees. In another situation I asked the town board for a copy of a developer's agreement so that I could make public comment and there was no response. I tried to contact the same town board about stadium-style lighting that shines miles out from a sand processing plant. Again, no response. Especially troubling given that the contact person for the town board owns property where said sand mine is operating. In the meantime, evenings spent stargazing with our two school-aged boys will not be the same and I'm worried about migrating birds this Spring. In the regulatory framework there needs to be enforceable rules around conflicts of interest. There also needs to be an obvious place to address complaints and concerns related to this industry. I tried to take concerns about conflicts of interest to the county. They sent me to the state GAB, who sent me to the county, who sent me to the local sheriff with whom I'd have to file a personal complaint. This is not an effective way to manage conflicts of interest in our elected officials.

Even when regulations are violated and enforced it currently doesn't mean the public or environment is protected. Superior Silica had an issue with storm water bringing sediment into Tainter Creek (a class I trout stream). The company lowered their overburden piles and dug some sediment out of the creek. I called the DNR to check on the health of the creek following the violation. They responded that although they'd love to know the condition of Tainter Creek they didn't have enough resources to do follow-up. Superior Silica has since opened an additional mine along Tainter Creek (closer to the Hay River). The health of our environment requires follow-up to violations.

The public needs to be absolutely sure that the research is done and regulations are in place to protect our water resources. Last June a presenter at the DNR indicated that there are sulfides in some of the Wisconsin sandstone formations. When a mine is opened up and the pH is low, there is opportunity for leeching out of heavy metals in the sandstone.So far, heavy metals have been found in the Tunnel City formations and Sparta, Monroe, Tunnel City, and the La Crosse area bluffs have been listed as areas of concern. Two wells have required replacement in the bluff areas of LaCrosse. In Turtle Lake, one well had to be replaced because of findings of arsenic in the water. Supposedly sulfides have been found in Barron Co., and SE Eau Claire Co. as well as Jackson Co. What about these issues in regard to reclamation, with waste or industrial sludge being put back into the pits? They may contain heavy metals. The studies and regulations should have been put in place long before any approvals were made for any of these mining activities.

Official public communications regarding this industry need to be up-to-date and accurate. Last summer the DNR released a new web page with a frac sand mining map. As the official, public, up-to-date account of the industry's footprint, it is woefully inadequate. Just In our little area between Prairie Farm and Arland there were at least two mines left off the map. Also, a single company that has multiple mines was listed only once, greatly reducing the perceived impact. I contacted the person in charge of

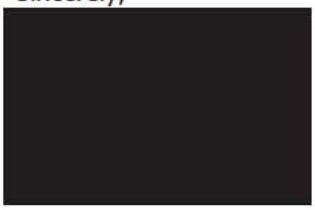
compiling this up-to-date map about these issues and she said the changes would take a while to appear since the map gets revised every three months. The updates that I sent her last July have still not been made.

A couple of years ago I had concerns about planning for the long term economic impact of frac sand mining, and wrote a letter to our county's Economic Development Director. My concerns (tourism, farming, hunting/fishing, quality-of-life) were met with derision instead of constructive feedback. It was clear that no thought was given to long term negative impacts or the boom/bust nature of this industry. Studies have to quantify the negative impacts of mining and measures must be put into place to keep our small towns vibrant during and after the mining. Mines should be required to develop employee programs that offset the unstable nature of the oil and gas industry, creating a permanent work force that's more likely to support a healthy community. Standards need to be created and enforced for cash assurance bonding to close any loopholes that might negate reclamation plans. We need to know that reclamation plans are rock solid in this unstable industry.

We need to know the cumulative impacts where there are multiple mines. I was told by the DNR that the only study regarding cumulative impacts is the water quality study being done in Chippewa county. In the meantime the mines are multiplying. Someone has to know where the cut-off is (ie. how much acreage in mining within a certain area is too much, how many high capacity wells can be put in a certain area). I live within two miles of six mines with the possibility of more to come. I'm concerned about the cumulative impact on wildlife, air-quality, water-quality & the stress placed on our small town boards whose energy could be put toward improving our communities instead of dealing with frac sand mines. Our counties' comprehensive plans need to be considered when determining how much of a part mining plays in our communities. Limits must be set.

My concerns are numerous only because so many troubling issues have made themselves known since frac sand mining entered our lives. Thanks again for this opportunity to speak up. The fact that this reevaluation process is happening gives me hope.

Sincerely,



From: [redacted]
To: Willger, Christopher J - DNR
Subject: Re: online survey
Date: Tuesday, April 21, 2015 11:19:45 PM

Hi Christopher,
I was actually asking for a friend that has no computer access and was using my computer. Here is his via my email address.

Industrial Sand Mining Strategic Analysis Online Public Input Form

Introduction

Thank you for providing information to the Wisconsin Department of Natural Resources (DNR) regarding your perspectives about industrial sand mining in Wisconsin. The DNR will use the information you provide to assist us in preparing our strategic analysis.

The DNR has prepared a draft outline of topics for the analysis. It would be most helpful if you review that outline before you complete this input form so you can let us know what topics we may be missing. Please go to this web address for more information: http://dnr.wi.gov/topic/EIA/ISMSA.html

Personal information

You are welcome to complete this input form without providing your personal information. To do so simply click the "Next" button at the bottom of this page.

If you would like to receive future email messages regarding this strategic analysis, please enter a valid email address.

Please be advised that your personal information may be included in open records requests that the DNR may receive about this project.

[redacted]

Interest

6. Please check one or more of the items below to describe yourself. Select at least 1.

I live next to or very near an industrial sand mining operation.
I live in an area with one or more industrial sand mining operations.
A sand mining operation is proposed near my home.
I own, run or work at a business next to or very near an industrial sand mining operation.
I own, run or work at a business in an area with one or more sand mining operations.
A sand mining operation is proposed near my business or place of employment.
I own, run or do business with an industrial sand mining operation.
I'm employed by an industrial sand mining operation.
I'm generally concerned about or interested in industrial sand mining in Wisconsin.
Other, please describe: My childhood home is also the religious center of the Grand Medicine Dance religion of the Ho-Chunk. It has been desecrated by a massive overflow of sediment from the Gerke Frac sand mine at Hyws 21 and county Hyway N in the township of Bryon in Monroe county.This concerns me greatly as now we will have to relocate the medicine dance religious center that has been there all my life because the well water quality has degraded and the lowlands behind our religious grounds are contaminated. We will not tolerate this description

any more than a catholic community would allow a tons of sediment to flood the inner sanctum during mass.

Air, water and land

Please describe specific aspects of each topic below that you think the DNR should include in the analysis. Please include links to relevant documents that you would like DNR to consider.

7. Air quality: The religious grounds have been affected by blowing dust which can sometimes be felt on the face on high wind days from 4 surrounding sand mines. Of most concern is the ultra fine particles as small as one tenth of a micron. This size can blow up to a hundred miles. These tiny, sharp particles do more damage than the larger sizes. http://wvpublic.org/post/wvu-researcher-warns-about-toxic-ultrafine-dust-wva
8. Surface water quality, aquatic habitats and wetlands: After walking the 40 acres of our religious grounds I found none to the usual mammals and waterbirds that are typically there. There is a white film covering the extent of the overflow area. The area is being evaluated by the Ho-Chunk Nation. As I observed the the current stream present on the propert I could see milky looking cloudiness and swirls moving downsteam.
9. Groundwater quality and quantity: The water at the religious grounds is degrade and the current residents will no longer drink from their well.
10. Land cover and habitats: Countless trees are ripped from the ground and burned to make the mining area. Food and medicine plants are obliterate. The fact that berms are constructed will not stop rogue dust but is in an attempt to give visual immunity to the frac sand mines. I believe that if destruction taking place...everyone should be entitled to witness it. What are they hiding anyway.

Social and economic

Please describe specific aspects of each topic below that you think the DNR should include in the analysis. Please include links to relevant documents that you would like DNR to consider.

11. Land use changes: The continuing destruction of viable, productive landscapes in order for a few people to acquire great wealth. Plants, animals, land and water are sacred and shouldn't be destroyed. Money is not sacred. Where are the ethics that define relationship of wisconsin citizens and their environment?
12. Transportation, traffic and safety: Frac sand trucks spill sand and shed dust when they travel local and state hyways. They drive at great speeds and are reckless. Many citizens will no longer travel certain roads and children are at greatest risk. Truck drivers will expose other people to dust when they enter establishments covered with this material.
13. Human health: I saw a shipment of bottled water go into the HiCrush mine. Why won't they drink the water from their high capacity well.
14. Visual changes: I once saw wolves and a mountain lion move across land that is now a frac sand mine. My children will never get this chance.
15. Noise and vibration: Truck noise, equipment running, railcar slamming, light pollution and vibration from blasting keeping entire trailer parks with hundreds of residents awake all night (Unimin mine, Tunnel City).
16. Local, regional and state economy: Infrastructure costs externalized on communities. There are no export taxes required on frac sand shipments. The industry is not required to indemnify any of their health, economic, social effects.

Other issues

17. Please describe any other topics related to industrial sand mining in Wisconsin that you think the DNR should consider in the strategic analysis. Please include links to relevant documents that you would lie DNR to consider.What is the purpose of the DNR? Would we see less damage from the industry if fines were commiserate with the damage? Paltry fines are often seen as cost of doing business. What is an aquifer worth? No one can design or build what has taken billions of years to form. Lets take the issue of real conservation seriously and behave as though everything that is sacred in our landscape actually matters. Stop the destruction.

From: [redacted]
To: DNR OEEA comments
Subject: Sand Mining Concerns
Date: Monday, April 20, 2015 7:11:25 PM

My Great-Great Grandfather purchased land in Preston Township, Trempealeau County, WI in the 1890s, This land has remained in the family ever since. My Great Uncle was born in the late 1920s. There have been stories of Native Americans still coming to Preston during the summers at the turn of the 20th Century. The children would play with the Norwegian-American/Immigrant childred living on the property south of my Uncle's farm. There is also a cave where the Native Americans used during the summers.

1. The DNR needs to address the issue that Trempealeau County has had significant archaeological finds since 1867 with the first recording of a Native American effigy mound. Various mounds have since been found, including burial mounds. Are the sand mining companies reporting such findings? If they do come across Native American artifacts (including burials), what are the companies doing to preserve/protect this history? Not only are Native American burial mounds found throughout the county but what about personal burials? Many farmers did not have the finances to bury family members in cemeteries, thus leading to many unmarked graves. Driving down I-95 through Preston my Great Uncle pointed to a hill and stated a 16 year old and 8 year old were buried on that hill. What of these burials?

2. The Coulee Region is a habitat for various wildlife and vegetation. The DNR recognizes this with the Lakes Coulee Wildlife Area. If this land was acquired to protect wetlands and grasslands, why would the DNR allow sand miners to potentially pollute and destroy these lands? Last Summer I saw large areas of water on Lakes Coulee Creek which I had never seen before, nor my mother who has been visiting the area since the 1950's. How much groundwater is used up by the sand mining companies? With this large increase of used ground water will the Lakes Coulee Creek begin to decrease? Will the "Class III Trout Stream" cease to exist as reduced water levels would make annual stocking to costly due to less Trout surviving?

3. What happens to the economy when the sand mining companies leave, after mining thousands of acres? Will this barren land be able to sustain a community? The few jobs that are created by these companies will be lost, and either those holding the jobs will move with the company or be out of work; both would create a decline in the economy, especially for such small rural towns. These towns will most likely be worse off than before the sand mining companies came. With small hills being mauled down by the sand mining companies, what impact does this have on bird migration? How many species will suffer from this dramatic change of landscape? It took the DNR over 40 years to re-establish the wetland of Lakes Coulee and some of this land hadn't been farmed since the Depression. How long would it take to restore the land to what it had once been before the sand mining? If it took 80 years for the area of Lakes Coulee, with the help of the DNR, return to the wetlands and grasslands the Native Americans would have remembered, does it not deem safe to assume it would take at least a century to repair the land from sand mining?

Please add these concerns to the DNR's analysis on industrial sand mining. This impacts not just the local communities but Wisconsin as a whole.

Thank-you for your time,

[redacted]

From: [redacted]
To: DNR OEEA comments
Subject: Sand mining
Date: Monday, March 30, 2015 1:13:13 PM

Hi,
I would Not like sand mines in our area
Thank you
[redacted]

Sent from AOL Mobile Mail

Chris Wilger
DNR
1300 Clairemont Road
Eau Claire WI 54701

[redacted]

Mr. Wilger,

We would like to express our thoughts and concerns regarding frac sand mining in our area, and Wisconsin in general. We will begin with the various impacts this industry affects.

Air quality:

Dr. Crispin Pierce, UW Eau Claire, has done a considerable amount of work, independently monitoring air proximal to mining / transload / processing facilities. Most disturbing of his findings, is the lack of mine operations required to monitor air quality, closely followed by the DNR air monitoring failing to monitor particulates that are most dangerous. His findings indicate that this danger exists, not just at the sites, but along rail routes and trucking routes, associated with them.

While we have heard that the symptoms and illnesses associated with particulate inhalation have not become widely manifest, keep in mind, the asbestos industry and the coal industry. For asbestos, there exists a 30 year window. 30 years of cumulative data does not exist, but the picture is in place. The differences? The asbestos industry has been assessed a significant amount deposited in a fund for health damages the industry has caused. These were corporations. The companies being set up for sand mining and processing, and transload and transport, are LLC's. When they close the briefcase and disappear, so does any chance for holding them financially responsible for long term health issues. Again, that leaves the state and therefore the taxpayers holding the bag.

Water:

To date, the DNR does not consider cumulative use in a given area, but issues high volume permits with no regard to a single aquifer. Land owners losing their wells to lowered water tables are simply stuck with no water, rendering their homes and farms valueless. As with the sulfide mine issue, chemicals are being used that will leach into the common aquifer, again, rendering private wells useless. In most instances, it is incumbent on the property owner to hire a hydrologist, an attorney, find another home, sue, and if they are successful in their suit, will have water trucked in "until a permanent solution can be reached." This assumes that they have the financial resources to do all of those things. The permanent solution is always of course, here's some money, get out. Many of us live in our dream homes and farms that have been in families for generations. Money will not make us whole. We want the farms and homes and land that we have bought and paid for, and the government agencies we are taxed to trust and support the land, to protect those interests. No person has the right to jeopardize another's property, and no government agency has the right to allow it. Frankly, the arrogance of the out of state "not in my backyard" mentality has worn thin.

Property values:

It is well documented that land values have plummeted. It is also well documented that municipalities and rural towns are losing state money and program support, based on skewed tax structures from the sand operations.

Reclamation:

There is no solid definition, and thousands of prime farm acres are now lost. Most applicants and operators, have an indistinct, vague mention of reclamation, with no specific plan in place. And to date, no one seems to much give a damn. What Wisconsin does not need, are a bunch of polluted dead water lakes or garbage dumps. Neither do we need the "over burden" sprinkled over the surface, chemical leavings and flattened hills in place, and no notion when or if this land will become tillable again. We were actually told, and expected to believe, that the land has been photographed, and would be restored, "tree for tree." Now you can begin to experience what we are going through.

Aesthetics and quality of life:

We live where we live for a variety of reasons. Some have lived on and worked the land for generations. It is a way of life, a living, and a necessity, if we wish to continue to eat reasonably priced food. Some of us moved to rural areas seeking to escape the noise and pollution of cities, and have made productive lives either working the land, or establishing businesses. We value what we sought, bought, and paid for. It is not the right of another, to compromise it. People travel to see the beauty of our landscape, hunt, fish, camp, ski, and hike in the wooded hills. Many are experiencing rural Wisconsin for the first time. They bring tourist dollars, stay in our motels and camp grounds, eat in our restaurants, and take rural Wisconsin home in their hearts.

In conclusion, we ask the DNR to do what it has done in the past. Protect the land and wildlife, not big business. We are aware that the pressure is great. We ask you to make responsible decisions that will keep rural Wisconsin as it has existed for the many generations we have lived on the land in health, enjoying uncompromised water and air, and yes, our land values.

[redacted]

March 4, 2015

Wisconsin Department of Natural Resources,

My husband and I chose to live and raise our three young sons in rural west central Wisconsin for all the reasons those here to testify did. Town of Cleveland is the headwaters for two rivers and contributes two other water sheds that flow from our peaks. I know that every drop of water I drink begins at the top of the north ridge of our property.

Groundwater and surface water are often thought of and treated as separate resources. However, groundwater and surface water are really integral parts of the whole water cycle. (Wisconsin Groundwater Coordinating Council, 2001 Wisconsin Groundwater Summit, " Sharing Our Buried Treasure")

Wisconsin's 1.2 quadrillion-gallon groundwater may seem inexhaustible. This groundwater is not simply in an underground reservoir, but is stored in complex layers of rock, shale, sand and other sediment.

Bedrock sandstone, sought by industrial sand mining, serves as a water filter by reducing the amount of pollutants that reach the groundwater. Wetlands account for 17% of Jackson County. They serve as filters for our water supplies, habitat for wildlife, replenish water tables and prevent flooding.

Industrial Sand Mining on a large scale

What are the short and long term cumulative natural resource impacts, of industrial sand mining on a large scale, on Wisconsin's entire hydro geological cycle as a whole?

- How will Frac sand mining, by the removal of this sand filter, pose a threat to local and regional water resources as well as releasing waste materials into the soil affecting ground water quality?
- How will high capacity wells impact local and regional water quantity and quality?

Prediction:

If: Industrial sand mining alters the hydrology of large tracts of land by removing the hills of the driftless,
Then: Wisconsin's human environment dependent on the water generated and filtered by the sand will be permanently altered.

>>

IF: Industrial mining discharges from overflowing settling ponds, withdraws large amounts of groundwater, or mitigates wetlands contributing to local hydrology,
Then: Environmental degradation of the quality and quantity of groundwater will occur.

Research to date:

WDNR published report January 2012, *Silica Sand Mining in Wisconsin,*

Does not include:

- A technical analysis of the potential cumulative impacts on groundwater.
- Data on anionic acryl amides in Ground water (the chemical used as flocculants in the water recycling steps for sand processing).
- Baseline: Static Water Quality Levels (lead, turbidity, suspended solids, chlorides)

Does suggest:

Ground Water (5.2.1 page 21 DNR)

Dewatering of Private wells

- If mine is below ground level(5.2.1.3)
- High capacity wells may result in 10- 95% water loss (Page 22 DNR)
    - Cone of depression
    - Water quality subject to change

Discharge to surface and ground water (DNR 5.2.2)

- Change in ground water levels,
- Reduce spring volume that could have thermal impact on streams. 5.3(page 29) and could cause coldwater tolerant species of fish and invertebrates to disappear. 5.3(page 29)
- Warm ground water
- Physically altering local hydrology drain patterns,
    - Holding ponds 10-25 year rain can wash silt sand gravel to surface water
    - Discharge of small particulates not included in TSS analysis can cause significant tributary issues
    - Storm water run off (5.2.4)

Though wetlands will be avoided **"If Possible",** but can be permitted if demonstrate they cannot be avoided.

Loss of Wetlands (5.2.3)

- altering local hydrology drain patterns
- change ground water levels

Research needed:

- **Expert Steering committee, representing all sides of the issue, that will develop a comprehensive and independent evaluation of silica sand mining on large tracts of land and it's cumulative impacts for Wisconsin.**
- **Report based on empirical, hard data supported by evidence.**
  - Characterize geologic and hydrologic conditions
  - Evaluate impacts on water resources
  - Access Groundwater experts to document, monitor and track water quality.
  - Access Surface water experts to document, monitor and track water quality.
  - Establish stream gauges base flow and discharge
  - Predict changes in
    - Topography
    - Soils
    - land cover
  - Monitor well
    - Elevation
    - Fluctuation
    - Flow gradients
  - Include: 5 year Groundwater Study Western Chippewa County

"All water is local. We need to take stock of our local water sources and manage them wisely."

"Are We Running Out of Water?"

(National Geographic, March 14, 2012,)

Please send me a copy of the outline and dates for the process WDNR will use to develop this Strategic Analysis. I am anxiously anticipating a Public Hearing on your daft Document.

Sincerely,

[redacted]

March 4, 2015

To Whom It May Be of Concern,

I am writing to the Wisconsin Natural Resources in testimony and witness of concerns regarding health and safety impacts created by Silica Sand Mining.

My home residence and Wisconsin certified tree farm lies 1.5 miles from the edge of the Hi-Crush Silica Sand mine located ouside of Augusta, Wisconsin. The majority of the wet plant along with my home, lie in Bridge Creek Township, the largest in area, but one of the smallest in population. It is an unzoned Town. Beside the ethical concerns I have about the intimidating tactics and empty promises made by this LLC, my primary concerns have always been with the health impacts of silica sand mining on living breathing life forms. Over the past three years since Hi-Crush has moved in and destruction of the land began, I have witnessed many concerning issues which include: 1) winter night winds blowing sparkling silica into the air from stockpiled sand at the Hi-Crush dry plant. These blowing sparkling crytals are evident night after night illuminated by the dry plant's own security lights. Where this silica travels to is anyone's guess, but since the prevailing winter winds are from the Northwest, it might be a good indicator to have placement of an air monitor or two for measurement of airborne silica. I am concerned for all of the families and livestock that live within ONE mile of this plant. However, it is apparent that this mine, when it is monitored, only places a small monitor on the convenient NW side of the dry plant and the wet plant. 2) It is everyone's understanding in Bridge Creek by now that High Capacity wells need be permitted. However, when an LLC such as this drills more wells than permitted and receives a monitary fine that does not and cannot retrieve or recover the clean water illicitly used, citizen faith in the State government is weakened severly. And, when local residents report the composition of their well water has chemically changed to display nitrates and heavy metals that are first noted by color and taste change, nothing still is done to protect them. It makes one wonder if it is because the residents reporting are Amish or because the mine will never hold true and follow the local mining ordinance. There is always a loop hole. *How long will it be before the signs of health decline show themselves? Will it be 15 years before silicosis shows itself? Will it be an increase in the amount of cancer diagnoses in the next ten years that will alert the health concerns?* 3) Hi-Crush publically stated to the Town Board and in a public hearing, that Hi-Crush had no plans to blast, when these concerns were raised at the hearing. However, upon reading a letter sent to its stockholders, the LLC indicated immense profits and further increase of profit production. Hense the commencement of blasting. Residents as far as 1.5 miles from the wet plant blast sites endure weekly and at times twice weekly blasts that shake their homes. We residents are documenting every date, time and outcome. My own reports are available at your request. The documented blasts impacting my home, rattling the dishes in my cupboard, shaking the ground outside of the house and startling every living thing in touch with ground, sending most wildlife to take refuge in my tree farm include: 6/5/14; 6/26/14; 7/31/14; 8/6/14; 8/14/14; 9/18/14; 10/28/14. I have also witnessed the impact of this blasting in the homes of neighboring Amish families in person: 6/20/14; 7/10/14; 7/31/14. These blasts have caused cracking in the walls of newly constucted homes, shaken cast iron wood cook stoves and dropped tools in wood shops. These too are being documented. *How long will it be before wells collapse and foundations break?* There is no justice. Safety concerns abound when blasting sounds send horses flying

endangering people. 4) Reclamation of this agricultural land is a joke. The County has been given the authority/responsibility/scapegoat position to approve reclamation plans from these mines. Each 40 acres of mined land must be reclaimed. Hoever, we have amassed from knowlegable soil scientists the horifying facts that the mined agricultural land will take 100 years of amendment before crops can be grown on it again. For almost ten years after mine reclamation, the land will not suport the growth of trees. *How can this be healthful to humanity when food cannot be grown, clean water, one of the rarest non-renewable resources in the world is being squandered away, placing health risks for contaminated water at an ignorant and irresponsible level of disregard?* And, finally, there are little known financial losses and health risks to those of us living by silica sand mines. The installation of high powered utiility lines has taken 40 feet of trees across 40 acres of my tree farm without compensation due to the need to feed energy to the mine. The energy companies due this using Right of Way open ended documents signed in the 40's. I also have grave concerns for my neighbors and for myself being required to live under such high voltage. I understand that the jury is still out on how to officially determine failing health due to this high voltage. Other residents of Bridge Creek suffered the same land loss due to the power poles but in addition have had their trees cut for the pipeline too. Burying a pipeline three feet below the surface sounds dangerous to one's health.

I do not envy those of you who choose to continue employ in the field of Natural Resources. Ethical internal battles must be most difficult. Citizens will continue to document and voice concerns. I would not like to be on the receiving end of the common sense "I told you so" and, "Sorry, doesn't help." *What ever happened to seeing the whole picture and the inter-relatedness of all things?*

I sincerely request that ambient air around silica sand mines be monitored and regulated year round using the 2.5 particulate measurement. I also believe that the Public Health Departments must report to the DNR any increased occurences of cancer and silicosis. The DNR should monitor the amount of clean water used by these mines and utilize projections of impact on the aquifers they tap. All private well water changes need to be collected by the DNR due to the presence of heavy metals in the land, the Cone of Depression phenomenon that occurs and for all well collapses due to blasting. Any and all of this lead to health issues. The DNR needs to monitor, study and inform the public when agricultural land cannot produce for 100 years after reclamation from mining.

Thank you for your attention to these very real issues we are having to endure.

March 12, 2015

To: Wisconsin Department of Natural Resources,
From: [redacted]

Re: DNROEEA Non-metallic mining scoping process

I am a building scientist with over 30 years of teaching and training contractors, builders, realtors, hvac technicians, etc. in the art and science of residential retrofit. The key concept is that our houses are interactive systems in which the flow of air, heat, and moisture are dynamic based on occupants, building structure, insulation levels, mechanical equipment, appliances, furnishing, and all the other "stuff" we humans stash in our homes. The priorities in assessing and improving home performance are rooted in three basic areas: 1) health/safety/comfort, 2) durability, and 3) energy & water efficiency. Retrofitting houses is a maturing industry. In the early decades we learned some hard lessons about the connections between indoor air quality and building durability. Both people and buildings died as a result.

I write this because on a far greater scale far our local and state environment is a complex of interactive ecosystems that can't be isolated. I do not want to find that five, ten, or twenty years down the road Wisconsinites are coping with damages due to unexpected or ignored consequences of industrial frac sand mining. I ask that as you move forward you apply the precautionary principle because there is no "do-over" once the bedrock sand, hills and ridges are removed, water is polluted, and people's health and well-being is compromised. The impacts go far beyond the local area, but most of my comments are focused there.

Considerations:

1. Air Pollution: Blasting, crushing, and transporting. Each step allows escape into the air.
    - I have driven by the Hi-Crush and New Auburn sites along highway 53 many times and seen sand blowing off the piles. Assurances from mining representatives that they 'store only wet sand outside' are ludicrous.
    - A friend reported her mother is no longer able to open her windows as desired because the sand "dust" blows in and settles 'everywhere'. A woman who lives in close proximity to a mine, but was not offered a buyout, bemoaned the damage to the finish of their new car—low-level sandblasting, as it were.
    - There is insufficient monitoring, understanding and regulation of allowable concentrations and particle size of silica sand in air.
2. Water Pollution: Ground and surface waters interact in the hydrogeological cycle in complex and interactive ways.
    - How will the flows of surface and ground water be changed as the ridges and hills are removed?

- What happens to runoff from the mined areas and storage and transload sites? How does that impact surface and groundwater?
- Is acid run-off likely in some areas?
- How are farmers supposed to deal with resulting turbidity when water is judged "drinkable" but animals won't
- What is the concentration in the water (and air and soil) of the acrylamides resulting from degradation of the polyacrylamides used in the process? What is a 'tolerable' level for known toxic agents?
- What disruptions to quality and quantity of water to residents and business are there? If de-watering causes individual wells to fail, will they be provided trucked in water forever?

3. Degradation of forest and farm land
    - Where are they put and what are the impacts of the flocculants used to treat water used in mining?
    - Revitalizing reclaimed soil to the point that it can support crop growth has not been successfully demonstrated.
    - What is the impact of using standard ag fertilizer at the rate required to return land to productive status on field runoff and groundwater?
    - How does the loss of land and habitat impact wildlife, and related economic endeavors—hunting, fishing, tourism?
4. Degradation of infrastructure, local economy, and property values
    - Increased heavy truck traffic is already taking a toll on the roads. What are the costs and plans to maintain those assets? It should not be at taxpayer expense.
    - What are the impacts of increased train traffic on safety—crossings and rails?
    - What happens to the rail lines when a mine is exhausted?
    - What regulations are there to address density of mines in any area?
    - Mining has proven to be a 'boom & bust' industry. Are there real and lasting benefits to local economies; what are they?
    - Property values have proven to go down relative to proximity to a mine.
    - How do reduced property values impact mortgages and sales prices? What impact does that have on Towns and taxes? Who bears that burden?
5. Loss of quality of lifestyle
    - What are the impacts of increased noise and 24 hour lighting on people and animals?
    - The rural character of the landscape is the reason many of us chose to live here.
    - The tear in the social fabric should not be minimized. Personal attacks and criminal acts (stealing of *fifty* "no-frac sand mine" signs in Cleveland Township, Fall 2014) degrade the quality of life.

The impacts of large scale industrial sand mining are unclear. As density increases, so do the stresses on water, wetlands, air quality, infrastructure, wildlife and neighbors. Some of us know what we've got and we don't want it to be gone in a hasty rush to the bottom of the sand formations.

Chris Willger

Wisconsin Department of Natural Resources

1300 W. Clairemont Rd.

Eau Claire, WI 54701

Re: Comments on the FRAC SAND STRATEGIC ANALYSIS PUBLIC SCOPING PROCESS

It is imperative that a BAN be placed on any further permitting of frac sand mines, processing plants, and trans-load stations in Wisconsin until a thorough study of all aspects of this heavy industry be studied in depth and a complete report delivered to all stakeholders including citizenry both near and a distance from the facilities. It is important there is documented and verifiable scientific data from reputable scientists with a track record of providing truthful data which has undergone peer review.

For nearly 7 years I have been involved in reading about and investigating the various aspects of frac sand mining and related industries along with visiting with many individuals involved in decision making or directly affected by the operation of the various portions of this industry. What has been allowed to happen in Wisconsin has created permitted facilities without any in-depth information or policy which directly relates to the industry. Permits given are based upon ancient thinking, law, and outdated rules and regulations that do not apply to frac sand mining and related industries. The basic question is: how many frac sand permits should be allowed under these ancient, unscientific directions that have allowed companies free reign in destroying the 500 million year old or more hill, bluff, and ridge formations in our state? The Precautionary Rule was developed in WI at Wingspread. Yet, it is not being followed at all. It is critical to read and study the recommendations as set forth when the Precautionary Principle was developed and then it should be used as a guiding light throughout the study.

Many air/water and other violations have been reported over these past years. There is little to no follow up unless the reports are advanced to the Department of Justice. Meanwhile the industry is allowed to continue polluting until corrections were made. With air quality itself, little to no watering has been required in the thousands of acres under the knife. With heavy winds, particulates all over my area of WI are blowing in huge amounts at this time of year. We have no idea of the impacts on human/animal life! Therefore, the Department must research the following areas and report data back to the public on the following concerns:

1. Air quality with long term impacts; establishment of a strong standard.
2. Water quality and quantity and long term impacts on ground and surface waters with the huge volume use for cleaning sand; drawdown impacts with high cap wells; limitations on approvals given for high cap wells in any given area as they relate to cumulative impacts on given areas.
3. Sulfide/low pH levels impacts upon the development of lakes in reclamation, drinking water wells and replacement when heavy metals in water supplies are identified; the impact on human life, wild life, livestock, other forms of life including food production in areas when silica is mined and processes/trans-loaded.
4. Current procedures/guidelines as established for sand/gravel pits and used for recovery of frac sand mines.
5. Waste impacts when there are flocculants/ heavy metals being put back into mines; should containment systems be required? Waste products/industrial sludge are dropped on highways frequently. Should there not be requirements/controls put on the industry for contaminating roadways and air with fugitive dust and chemicals when trucks deposit this on roadways and into air?
6. How the DNR departments can work together to resolve problems. It appears the water/air quality/waste divisions work separately from one another with departments not collaborating on some of the issues that surface. Teams of people from all divisions should be putting their heads together to come up with resolutions. Informational brochures should be coming out from all departments so the public knows how it might start protecting itself. Public heath departments in all counties should also be involved so they can become part of an alert system to protect residences and life.
7. Financial backing/educational resources should be provided to Town Board/County Board and other groups to learn more about the downsides environmentally of this industry and then to adequately supervise and monitor the industry they allow into their town or county. Develop helpful materials with citizen/town/county input such as MN has done with their TOOLKIT produced by the EQB so policy makers and decision makers have reasonable materials they can refer to when deciding if silica industry are best for their area.
8. Specify what is meant by “best management practices”. Identify new equipment and standards that must be met that correspond with expectations. Highlight performance standards that must be met and the degree required before an industry is closed and/or allowed to reopen.
9. Protect valued trout streams in Wisconsin! Require or recommend larger setbacks. The Duncan Creek is under siege! The economic impact upon the stream, fishing trout, the City of Bloomer and Lake Como and the residences along that Lake, the Tilden Millpond and the residences along that pond, and the Glen Lock Lake where donations are sought for trout planting, for handicapped piers…….and into Irvine Park in Chippewa Falls which has become a “jewel” for the city and its economic development. A 3 and ½ million dollar development at the confluence of Duncan Creek and the Chippewa River could be destroyed if there is a spill from one of the industry’s developments in the Town of Bloomer is not controlled (resin/trans-load/processing/mining).

10. Protect farmland, our major food producers, forests, wildlife and endangered species with enforcement/regulations/oversight/ and appropriate shut downs if rules are not followed. Establish parameters (rules to follow!)
11. Check out recent studies on the economic values of plants/forests for taking care of CO2 emissions. (Ted Auch, FracTracker).
12. Do rule setting on blasting! Companies are blasting without issuing warnings to residences; if reported, no one from the department follows up.
13. Set standards in the department for noise. There are none now and residents are being blasted out in the middle of the night with train whistles, trains coupling/uncoupling, blasting in the middle of the day, drilling for dynamite placement at night, heavy fan sounds, truck traffic, heavy equipment operators etc. etc.
14. Establish safety standards (performance) for all aspects of the industry.
15. Establish standards for the industry doing borings; people can't trespass on the property of others? How can the Department of Natural Resources expect citizens to be the reporters of all uncovered boreholes when it is illegal to step on the property of others without fines.
16. Allow funding to flow through the State of WI to counties so they can hire more staff in the departments to oversee reclamation permitting as well as train farmers and residential people on protection of shorelines, rotation of crops and other conservation measures they were expected to accomplish.

I could list pages of expectations. However, please look at the resources given you to identify even more of the relevant problems. MN has developed resources tools in their Tool Kit. They have worked this past year on model pieces of information. Please use these and other resources available locally, regionally, statewide and most of all nationally as this has become a National and International issue with hydraulic fracturing becoming the so called source of energy for this nation and others. It is NOT clean! It is NOT healthy.....and the mining of FRAC SAND (Silica) is destroying our state in many ways.

If you desire more information, more resources, people who can share their stories with you, please call me and I will be delighted to refer you to resources!

Thanks for allowing this limited input. There is much more to say.

What the strategic analysis should include.

What are the concentrations of 2.5 micron silica particles per liter of air in sand mining zones? How high is it? Why is this not required to be monitored as part of permitting process?

What is the concentration of Acrylamides' in the water, soil, and air after the polyacrylamides break down from sunlight hitting them?

What are the effects of noise pollution on people and livestock living around the mines?

Why the DNR does not enforce existing DNR regulations regarding non metallic mining but continues to permit more mine's.

What are the disruptions of water quality and quantity due to sand mining activity?

Effect of around the clock operation on the health of persons living within mining impact area up to 5 mile away

What is the effect of decreased property values on residents who are not offered buyouts?

What is the damage to roads by increased truck traffic on state highways and how much it is costing the state to repair roads damaged by constant heavy truck traffic.

What happens when the ridges are gone and violent storms move through the area? How much more damage are residents going to suffer. Will this cause their insurance rates to rise?

University of Wisconsin-Eau Claire
105 Garfield Avenue • P.O. Box 4004 • Eau Claire, WI 54702-4004

Chris Willger
WDNR
1300 W. Clairemont Ave.
Eau Claire, WI 54701
DNROEEAComments@wisconsin.gov

Re: WDNR Silica Sand Study Scoping

30 April 2015

Dear Mr. Willger:

With this letter, I would like to share recommendations for the planned Wisconsin Department of Natural Resources follow-up analysis of frac sand mining in the state. Having led a research team at the University of Wisconsin-Eau Claire to measure airborne particulates and silica around frac sand operations over the last six years, I believe that our findings are relevant to the scope of the upcoming DNR analysis.

Our work has occurred in three stages: use of direct-reading, filter-based, and EPA-certified filter-based instruments. With all three sets of instruments, we have measured $PM_{2.5}$ particulates both above and below the EPA $PM_{2.5}$ annual standard of 12 $\mu g/m^3$ in locations around Wisconsin. We are continuing with long-term monitoring, currently in Bloomer/Cook's Valley and planned for New Auburn and Trempealeau County.

A peer-reviewed manuscript of our work has been accepted and will be published as a feature article in the November 2015 issue of the Journal of Environmental Health. Abstract follows:

PM2.5 Airborne Particulates near Frac Sand Operations

Crispin Pierce, Kristin Walters, Jeron Jacobson and Zachary Kroening

University of Wisconsin–Eau Claire

Abstract: The rapid growth of hydraulic fracturing for oil and gas extraction in the U.S. has led to more than 140 permitted "frac" sand mines and processing plants in Wisconsin. Potential environmental health risks include increased truck traffic, ecosystem loss, and groundwater and air pollution. Emitted air contaminants include fine particulate matter (PM2.5) and respirable crystalline silica. Inhalation of fine dust particles causes increased mortality, cardiovascular disease, lung disease, and lung cancer. In this pilot study, use of a filter-based ambient particulate monitor found PM2.5 levels of 5.82–50.8 µg/m3 in six 24-hour samples around frac sand mines and processing sites. Enforcement of the existing U.S. EPA annual PM2.5 standard of 12 µg/m3 is likely to protect the public from silica exposure risks as well. PM2.5 monitoring around frac sand sites is needed to ensure regulatory compliance, inform nearby communities, and protect public health.

The DNR analysis should address the following questions:

1. What independent data are available about air quality around frac sand facilities; specifically PM_{10}, $PM_{2.5}$ and respirable quartz?
2. Do existing data fully characterize the spectrum of well-run and poorly-run facilities?
3. Do existing data adequately characterize differences in air emissions between mines, processing plants, and transportation hubs?
4. Should fugitive dust sources be considered in DNR AERMOD analysis when permitting new facilities?
5. Should DNR consider requiring measurement of $PM_{2.5}$ rather than PM_{10} by industry, giving the former's much more critical health risks?
6. Should DNR reconsider its practice of waiving more than 90% of monitoring requirements for new frac sand facilities?
7. Should DNR reconsider classifying crystalline silica (quartz) as a hazardous air pollutant, given that it meets this definition under NR445?
8. Should DNR explicitly consider emissions from existing frac sand facilities within an "airshed" when permitting a new facility?

Having studied these issues and conducted field measurements, I believe the questions above are essential to answer in the context of public health risk, assuring communities where frac sand activity takes place, and properly regulating this burgeoning industry in Wisconsin.

Sincerely,

Crispin H. Pierce, Ph.D.
Associate Professor / Program Director

Excellence. Our measure, our motto, our goal.

Midwest Environmental Advocates

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/MidwestEnvironmentalAdvocates

/MidwestAdvocate

April 20, 2015

Chris Willger
Wisconsin Department of Natural Resources
1300 West Clairemont
Eau Claire, Wisconsin 54701.

Re: Comments on Industrial Sand Mining Strategic Analysis Draft Topics Outline

Dear Mr. Willger:

We appreciate the opportunity to submit comments to the Wisconsin Department of Natural Resources ("DNR") regarding its draft topics outline on the scope of the industrial sand mining strategic analysis. Midwest Environmental Advocates, Inc. ("MEA") is a non-profit environmental law center that provides legal and technical assistance to communities and families working for clean air, clean water, and clean government.

Over 1,000 citizens petitioned in favor of this strategic analysis with the help of MEA. We applaud the DNR's willingness to conduct this study and provide much needed answers about the impacts of this industry. Additionally, we hope this will be an opportunity for the DNR to analyze whether its regulations adequately protect the environment and public health from the impacts of industrial sand mining.

We understand that the strategic analysis aims to update the information provided in a previous report on silica sand mining in Wisconsin released by the DNR in 2012. That report failed to address numerous concerns and is out-of-date given the continued growth of the industry and significant new research and data. A comprehensive analysis of the cumulative impacts of this industry is critical as the number of active mines and processing facilities has nearly doubled since 2012, and mines and processing facilities have begun to cluster in areas of the state near existing transportation infrastructure.

We are confident that a thorough, science-based strategic analysis will provide invaluable information to citizens concerned about the health of their families and to local, state and federal decision makers who are responsible for regulating this industry. It is imperative that the scope of the strategic analysis be adequately defined at this stage. Below, we describe a number of important

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impacts and topics that may not be covered under the DNR's strategic analysis scope outline. Further, please consider the citizen petition for a strategic analysis as an addendum to and part of our comments on the scoping process. The citizen petition for a strategic analysis contains a comprehensive discussion of potential impacts of this industry. We hope the DNR modifies the scope of the strategic analysis in order to ensure a comprehensive analysis of the cumulative impacts of this industry.

1. **Industrial sand mining**

The public as well as local, state and federal decision makers need accurate information regarding the content of the industrial sand being mined in Wisconsin. Industrial sand has many uses, but the primary use that spurred rapid growth in the industry over the past few years is for use in the hydraulic fracturing process. This industrial sand, sometimes called frac sand, is made up of silicon dioxide. Given the quantities of silicon dioxide being mined, it is critical that regulators and the public understand its ability to act as a harmful air and water pollutant when released into the environment. We request that the DNR add a subtopic under the "Industrial sand mining" section to examine the resource being mined: sandstone bedrock containing silicon dioxide. We ask that regarding this item, the DNR include a detailed explanation of silicon dioxide and its byproducts when exposed to air and water. This will inform the public of the risk that the industrial sand mining process may cause harmful air and water pollution.

Section 1.2 Current market – we ask the DNR to examine known information about both the industrial sand market in Wisconsin, as well as the hydraulic fracturing market in which much of this sand is used. There have been stories in the news recently that indicate the market is declining for oil and gas from hydraulic fracturing because of oil and gas prices.[1] A current as well as forecasted picture of the market is relevant to the short- and long- term socioeconomic impacts of this industry.

1.6.11 Reclamation – In regard to assessment of the reclamation process employed after mining operations have been completed, we request specific consideration of the adequacy of financial security required from industrial sand mines. The financial security provided is one of the most important components of the reclamation plan to ensure long-term environmental protection. There is no substitute for adequate financial security to ensure reclamation is done even if the company is no longer solvent. Additionally, the DNR should also evaluate whether local governments responsible for reviewing and approving reclamation plans have the capacity to adequately analyze these complex plans. The DNR should also provide suggestions on how to ensure adequate review at the local level.

2. **Environmental Topics – affected environment and primary, secondary and cumulative effects (as appropriate)**

The 2011 silica study repeatedly indicated that more information is needed to determine whether crystalline silica emissions from industrial sand mines pose a threat to Wisconsin citizens. Since

[1] David Shaffer, Frac sand industry fells the effects of low oil prices, less drilling, Star Tribune (Apr. 7, 2015), available at http://www.startribune.com/local/298845431.html.

that time, a number of studies have been conducted to explore the impact of crystalline silica emissions from industrial sand mines.[2] These studies show that, contrary to the industry's assertions, industrial sand is not free of fine respirable silica dust.[3] Since the DNR analyzed the industrial sand mining industry in 2012, the industry has continued to expand, and new information regarding potential environmental impacts has raised more questions than answers. The DNR has repeatedly stated that more information is needed to determine the threat of harmful air pollutants related to industrial sand mining. To that end, the scope of the strategic analysis should include subtopics under the "Air quality" section to indicate which specific air quality impacts the DNR will address.

2.1 Air quality – In order to ensure that this strategic analysis addresses the numerous remaining questions regarding harmful air emissions from industrial sand mining, we request clarification of the scope of the "Air quality" section. We request that the DNR include subtopics under the "Air quality" section that will describe areas of interest, such as those subsections used under the "Water" and "Land" sections. Subtopics under air quality should include, at a minimum – PM2.5 emissions, PM10 emissions, crystalline silica emissions, and nitrogen oxide emissions. Each of these subtopics should explore short-term impacts as well as the effect of long-term exposure. This section of the strategic analysis should include all existing research and note where more research is necessary. The air quality section should also include an analysis of the existing PM10 data we have from industrial sand mines, and an analysis of whether this air monitoring is effective in estimating air impacts from these industrial sand mines. Regarding cumulative air effects, this section should outline whether the DNR is currently gathering any data about the cumulative air impacts of industrial sand mines that are located close together and what is known and unknown about cumulative air impacts.

2.2.2 Wetlands – In regard to wetlands, this assessment should include not only direct impacts, but also secondary impacts of wetland fill from related transportation infrastructure—road and railway traffic and construction—as well as cumulative impact of this wetland fill going on in the same region all at the same time.

2.2.2 & 2.2.3 Surface and groundwater quality – In regard to surface and ground water quality, the DNR must address the known and unknown impacts and existence of acid mine drainage

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[2] Michael Ladouceur, Ministry of the Environment, *Air Quality Impacts of Unimin Ltd. On Kasshabog Lake near the Town of Havelock, Ontario* (February 15, 2013), *available at* http://www.pcchu.ca/wp-content/uploads/2013/04/Unimin_Report-of-a-PO-Original-Signed-byMEL.pdf. The Ontario study found elevated levels of PM10, PM2.5, and PM1.0 approaching or exceeding levels of concern near sand mining and processing sites and concluded that the operations were having adverse effects on air quality. The OSHA study measured respirable silica at hydraulic fracturing sites and found airborne concentrations exceeding occupational exposure limits by factors of 10, 20, or more, and concluded that exposure to respirable crystalline silica is an occupational exposure hazard for workers at hydraulic fracturing sites.

[3] *Air Monitoring at Minnesota Silica Sand Facilities,* Minn. Pollution Control Agency (last modified July 1, 2014, 1:12 PM), *available at* http://www.pca.state.mn.us/index.php/air/air-quality-and-pollutants/air-pollutants/silica-sand-mining/air-monitoring-data-at-minnesota-silica-sand-facilities.html#jordan-sands.

from industrial sand mining. It is well-established that serious water quality impacts are associated with acid mine drainage.[4] All mineral extraction activities may cause acid mine drainage by exposing large surface areas of sulfide rock to air and water. This is of particular concern in certain regions of Wisconsin, such as the Cambrian Jordan and Wonewoc sandstone formations, which are located in very close proximity to significant sulfide mineralization areas.[5]

2.3.3. Land – In order to ensure proper assessment of the impact of industrial sand mining on endangered and threatened species, we request a subtopic under the "Land" subtopic dedicated to the on-going and likely future impacts of industrial sand mining on the species that live in regions of the state in which industrial sand mining is proliferating. For example, one such endangered species being impacted by industrial sand mining is the Karner blue butterfly. The DNR should explore in the strategic analysis the limited participation of the industrial sand industry in the Karner Habitat Conservation Plan. Only one sand industry company has joined or applied to the state's habitat conservation plan, despite the fact that the Karner blue butterfly's habitat nearly perfectly overlaps with the location of sandstone suitable for industrial sand mining. In addition to the obvious impacts to the Karner blue butterflies, the DNR should consider the many other potentially impacted endangered and threatened species in the region, including bald eagles. The DNR should also examine whether industrial sand mines may impact the northern long-eared bat, which the U.S. Fish and Wildlife recently listed as threatened.[6] Tree clearing, among other activities, by industrial sand mines may impact this species and the industry will need to ensure that its operations do not endanger this threatened species.

The DNR must include an analysis of secondary and cumulative environmental effects in the strategic analysis. To provide robust information, the strategic analysis must also examine both

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[4] Ata Akcil & Soner Koldas, Acid Mine Drainage (AMD): Causes, Treatment and Case Studies, Journal of Cleaner Production 14, 1139, 1139 (2006).

[5] Minn. Environmental Quality Board, *Report on Silica Sand* 28 (Mar. 20, 2013), *available at* http://www.eqb.state.mn.us/documents/23.%20March%20Final%20Silica%20Sand%20report.pdf; Mining Watch Canada, EMCBC Mining and the Environment Primer: Acid Mine Drainage, *available at* http://www.miningwatch.ca/emcbc-mining-and-environment-primer-acid-mine-drainage; Wis. Geological & Natural History Survey, *Bedrock Stratigraphic Units in Wisconsin* 2 (2011), *available at* http://wcwrpc.org/Frac_Sand/Geology/Bedrock_Stratigraphic_Units_in_WI_1-12-12.pdf; Allen V. Heyl, Jr., Erwin J. Lyons, & Allen F. Agnew, *Exploratory Drilling in the Prairie du Chien Group of the Wisconsin Zinc-Lead District by the U.S. Geological Survey in 1949-1950*, at 5-6 (Nov. 1951), *available at* http://pubs.usgs.gov/circ/1951/0131/report.pdf. ("Sphalerite, pyrite, and marcasite were found in the Franconia sandstone…The sulfides in these shaly sandstone beds occur between the quartz sand grains."). The Franconian formation includes Tunnel City Group. Jennifer D. Eoff, *Sequence Stratigraphy of the Upper Cambrian Tunnel City Group, Upper Mississippi Valley*, 302 Sedimentary Geology 87, 88 (2014). *See also* Lee Clayton and John W. Attig, Wis. Geological and Natural History Survey, Information Circular 67, *Geology of Sauk County* 20 (1990), *available at* http://www.koubadrilling.com/well-drilling/docs/sauk-county-geological-report.pdf.

[6] U.S. Fish and Wildlife Service, Northern Long-Eared Bat (Myotis septentrionalis), *available at* http://www.fws.gov/midwest/endangered/mammals/nlba/.

short-term and long-term effects for the full range of impacts addressed in the strategic analysis. As the DNR has pointed out, the industrial sand industry will continue in Wisconsin for many years. This strategic analysis is critical to provide sound planning to protect the environment and public health as this industry grows.

3. Socioeconomic topics – affected environment and primary, secondary and cumulative effects (as appropriate)

In order to conduct a full strategic analysis, the DNR must identify the specific existing land uses that may or may not conflict with industrial sand mining. The economic, social, cultural and public health impacts related to industrial sand mining will vary from community to community, as well as varying in different regions of the state. In order to ensure this strategic analysis is applicable to the specific communities, industries, and land uses that will be directly (or indirectly) affected by industrial sand mining, we request that the "Socioeconomic topics" section include the following. (1) A catalog of *specific, existing land uses* in the regions of Wisconsin in which industrial sand mining has proliferated and not just a description of the general categories of land uses. This should include a detailed explanation of the prevalence of each land use in the region, and identify land uses that provide a social or economic benefit to the community. (2) A catalog of *specific existing businesses and industries* and how those specific businesses and industries will be impacted by industrial sand mining. Also, in addition to the primary, secondary and cumulative effects, we request that this strategic analysis specifically include both short-term and long-term effects as a part of the evaluation of the primary, secondary and cumulative effects.

3.5 Land use and zoning – In regard to the specific effects of industrial sand mining on land use and zoning, the DNR's assessment should include a sound evaluation of allegations of local government decision-making corruption, lack of transparency during the decision-making process, and failure to follow open meetings laws.

3.9 Human health and safety – In regard to the specific effects of industrial sand mining on human health and safety, we request that the assessment include evaluation of worker safety issues from accidents and exposure to crystalline silica dust.[7] It is also important to note that there is a lot of overlap between environmental impacts and human health impacts. For example, concerns about air emissions of fine particulate matter including silica dust are at their core public health concerns. Further, water quality concerns about potential acid mine drainage that may be causing unsafe levels of metals in private drinking water wells are both environmental and public health concerns.

3.10 Visual and auditory – Neighbors of industrial sand mines report significant and serious visual and auditory impacts from this industry. We request that specific attention be given to

[7] Centers for Disease Control & Prevention, U.S. Dep't of Health and Human Services, *Health Effects of Occupational Exposure to Respirable Crystalline Silica*, NIOSH Hazard Review (Nov. 2002), *available at* http://www.cdc.gov/niosh/docs/2002-129/; *Silicosis*, Occupational Safety & Health Admin., *available at* https://www.osha.gov/Publications/silicosis.html.

visual and auditory effects from transportation (*i.e.*, trucks and trains) in addition to the direct impact of noise and light from mining and processing facilities.

4. Regulatory framework

4.1 State of Wisconsin – Wisconsin's particulate matter regulations in NR 415 have not been updated since the inclusion of ambient air standards for PM2.5 and PM10 to replace the previous particulate matter air standard. Further, the DNR has not yet incorporated the more stringent ambient air standards of PM2.5 and NOx in its ambient air quality standards in NR 404. For these and other reasons, we believe the air permitting program is out dated and not appropriate for industrial sand mines. We request the DNR make a determination regarding the adequacy of the air permitting program to address this industry. Specifically, ambient air monitoring requirements should be reassessed for this industry because PM2.5 emissions are of particular concern.[8]

Wisconsin's storm water permitting program also may be inadequate as it is being applied to industrial sand mines. The results of recent storm water pond sampling by the industry and DNR indicated high levels of metals at many sites and high pH fluctuations. Further, numerous residents and journalists reported serious storm water runoff events stemming from poor practices and noncompliance with permits and regulations.[9] The DNR has also publicly acknowledged that its general storm water permit for industrial sand mines does not work well, and the DNR is currently in the process of revising that permit. We understand that the DNR is currently reviewing its storm water general permit for industrial sand mining. The DNR's review of that permit should be informed by information gathered in the strategic analysis process. It is particularly important to look at current laws, regulations and permits to determine whether changes are needed and what would fix the problems.

4.2 Local – Under the current system of regulation for industrial sand mining, local counties, cities, villages and towns in Wisconsin are currently left with little control over where and how sand mining occurs. This is an important concern because local governments are most affected by the negative impacts of industrial sand mining and may be in the best position to address the quality of life impacts associated with industrial sand mining. Thus, we request further evaluation of the appropriate level of local control and regulation of the industrial sand industry, with particular focus on establishing a better balance between state and local regulations. In this evaluation the DNR should address the related issue of land annexation as a tactic to circumvent local land use ordinances. A number of bills related to industrial sand mining have been

[8] Case No. DNR-13-043, *In the Matter of an Air Pollution Control Construction Permit Issued to FTS International Services, LLC*, Permit Number 12-POY-079.

[9] In response to Midwest Environmental Advocates' request, the DNR provided results of sampling from storm water ponds at fourteen frac sand facilities in Wisconsin. A summary of that data, along with a reference table with Wisconsin's surface and groundwater quality standards and EPA's national recommended water quality criteria, is available on Midwest Environmental Advocates' website; Josephine Marcotty, *Wis. Sand-Mine Spills Cause Call for Penalties Against Minn. Firms*, Star Trib. (June 12, 2012), *available at* http://www.startribune.com/local/158518655.html.

introduced by the legislature in the last few years, with several focusing on local control over this issue.[10] These bills, along with the reasons for public support or opposition to them, may provide valuable informative to the DNR about the need for more local control. Coupled with local control is the ability of local governments to address reclamation after industrial sand mining operations move on. In conjunction with its evaluation of the appropriate level of control, we request that the DNR consider whether local governments can address reclamation under the current system of regulation when local governments are left with the heavy burden of ensuring that their land will be restored after mining operations whether or not the mining company is able to pay for reclamation.

4.4 Tribal – Several tribal nations are particularly affected by industrial sand mines and processing facilities. Given the location of the Ho-Chunk nation, they are particularly at risk from impacts and are already experiencing those impacts. The DNR should consult with the Ho-Chunk nation and other impacted tribes throughout the strategic analysis process to ensure that their interests are adequately addressed.

4.5 Neighboring states – In regard to neighboring states, we request that the DNR give serious consideration to following the lead of states such as Minnesota, which have taken a more cautious approach in the industrial sand mining boom. Minnesota has conducted thorough evaluations of the industrial sand mining industry and has implemented more regulations specific to the industrial sand mining industry. In particular, in an effort to inform Wisconsin state legislators regarding the purpose and the value of the laws enacted in Minnesota, the DNR should assess the following already addressed by Minnesota: environmental reviews for all silica sand projects; extensive water studies by the DNR of any industrial sand mine located near a trout stream; a silica sand mining trout stream setback permit for excavation or mining operations in driftless areas; the development of rules specific to the silica sand industry for the control of PM2.5 and PM10 emissions; and cooperation with local governments to develop model standards and criteria for mining, processing, and transporting silica sand, which take into account unique landscape characteristics of different part of the state, that can be used by local governments when developing local ordinances.

5. Alternative approaches

The DNR's outline for the strategic analysis does not include any information regarding alternative approaches. In the scoping process, the DNR must not only identify issues to be included in the analysis, but also must determine "potential alternative approaches, potentially affected natural resources, and likely effects of the alternatives on those resources."[11] The DNR must examine alternatives to current methods of industrial sand mining and processing and to the current regulatory process.

[10] Senate Bill 349, 2013-2014 Wisconsin Legislature, https://docs.legis.wisconsin.gov/2013/proposals/sb349; Senate Bill 632, 2013-2014 Wisconsin Legislature, https://docs.legis.wisconsin.gov/2013/proposals/sb632; Assembly Bill 816, 2013-2014 Wisconsin Legislature, https://docs.legis.wisconsin.gov/2013/proposals/ab816.
[11] Wis. Admin. Code § NR 150.10(2)(a).

For example, it has been widely reported that the storm water retention and the permit for storm water discharges are not effective to prevent sediment, storm water and waste water discharges.[12] The DNR should examine alternative methods of storm water retention and treatment and alternative regulatory measures. Alternative regulatory measures could include an improved industrial storm water general permit or individual permits to better address individual facility designs and potential discharges. Thus, we ask that the DNR add a discussion of alternative treatment and sampling methods to 1.6.6 Process water and stormwater management. Further, we ask the DNR to examine alternative water discharge regulatory approaches under 4.1 State of Wisconsin in the Regulatory Framework section.

Another related alternative that the DNR should examine is requiring industry monitoring for air and water pollution. Currently, the DNR requires limited air and water monitoring. Under the Regulatory framework section and the 4.1 State of Wisconsin subsection, the DNR should identify alternative requirements for air monitoring and water sampling, and whether those alternatives would better ensure that environmental standards are met. The DNR should also examine whether additional monitoring would address the significant public concern and uncertainty about this industry.

One of the primary reasons a strategic analysis of industrial sand mining is needed is to identify alternative regulatory strategies and to evaluate the capacity of existing regulations to address the impacts of the industrial sand mining industry. However, the regulatory framework section does not mention alternative approaches and it is not included anywhere else in the draft topics outline.

In order to ensure proper review of the adequacy of the current regulations and policies governing industrial sand mining and their ability to protect public health and the environment, we request that an additional subtopic that focuses on alternative regulatory strategies be added to the list of subtopics under the “Regulatory framework” section. In conjunction with an alternative strategies section, we request clarification that the scope of the “Regulatory framework” section will be more than just a general outline of the regulatory responsibilities of the relevant entities. Analysis of the regulatory framework should evaluate the efficacy of current regulations, identify alternative regulations and policies being used in neighboring states and at the federal level, and the DNR’s willingness to adopt such practices in Wisconsin.

Thank you for your consideration of our comments. Attached is the DNR’s scoping outline including additions to the outline proposed in these comments. If you have any questions, please let me know.

[12] For example, in May of 2014, a sand mine near New Auburn, Wisconsin discharged an unknown quantity of stormwater from its stormwater pond into nearby wetlands and a dry run 100 yards from Beaver Creek. A concerned citizen sent pictures to Midwest Environmental Advocates showing that a normally dry run was clearly flooded by water that had a high concentration of sediment. The DNR investigated the discharge and determined that it was legally allowed by the permit. Events like this illustrate the need for the DNR to reevaluate whether its storm water policies and permitting procedures are adequately protecting the environment.

Sincerely,

/s/

Sarah Williams
Staff Attorney
Midwest Environmental Advocates

EXAMPLE OF OUTLINE WITH APPROPRIATE TOPICS AND SCOPE:

1. Industrial sand mining
    - 1.1. Historic sand mining in Wisconsin
    - 1.2. Current market
        - *1.2.1. Industrial sand market*
        - *1.2.2. Hydraulic fracturing market*
    - 1.3. Explanation of hydraulic fracturing
    - 1.4. Location of hydraulic fracturing
    - 1.5. Current operations and trends
    - 1.6. Aspects of industrial sand mining
        - 1.6.1. Overburden removal
        - 1.6.2. Excavation
        - 1.6.3. Blasting
        - 1.6.4. Crushing
        - 1.6.5. Processing (including use of chemicals)
        - 1.6.6. Process water and storm water management
            - *1.6.6.1. Alternative treatments and sampling methods*
        - 1.6.7. Spill prevention and response
        - 1.6.8. Storage facilities
        - 1.6.9. Waste Management
        - 1.6.10. Transportation and load-out facilities
        - 1.6.11. Reclamation
            - *1.6.11.1. Mining companies*
            - *1.6.11.2. Local governments*
    - *1.7.The sought after resource: sandstone bedrock containing silicon dioxide*

2. Environmental topics - affected environment and primary, secondary and cumulative effects (as appropriate)
    - 2.1 Air quality
        - *2.1.1. Short-term/long-term effects of PM2.5 emissions*
        - *2.1.2. Short-term/long-term effects of PM10emissions*
        - *2.1.3. Short-term/long-term effects of crystalline silica emissions*
        - *2.1.3 Short-term/long term effects of nitrogen oxide emissions*
    - 2.2. Water
        - 2.2.1. Surface water features and locations
        - 2.2.2. Surface water quality
        - 2.2.3. Groundwater quality
        - 2.2.4. Groundwater quantity
        - 2.2.5. Wetlands
        - 2.2.6. Fish and aquatic species
    - 2.3. Land
        - 2.3.1. Forests
        - 2.3.2. Grasslands

2.3.3. Wildlife

3. Socioeconomic topics – affected environment and primary, secondary and cumulative effects (as appropriate)

- 3.1. Local and state economy
- 3.2. Property values
- 3.3. Population
- 3.4. Transportation
- 3.5. Land use and zoning
- 3.6. Agricultural lands
- 3.7. Public parks and recreational lands
- 3.8. Archaeological, cultural, tribal and historic resources
- 3.9. Human health and safety
- 3.10. Visual and auditory

4. Regulatory framework

- 4.1. State of Wisconsin
  - *4.1.1. Alternative requirements for air monitoring and water sampling*
  - *4.1.2. Alternative water discharge regulatory approaches*
- 4.2. Local
- 4.3. Federal
- 4.4. Tribal
- 4.5. Neighboring states
- *4.6. Alternative regulatory strategies*

April 20, 2015

Via Email: DNROEEAComments@wisconsin.gov

Chris Willger
Wisconsin Department of Natural Resources
1300 W. Clairemont
Eau Claire, WI 54701

RE: Wisconsin DNR Industrial Sand Mining Strategic Analysis Comment Letter

Mr. Willger:
Unimin Corporation supports the State of Wisconsin's update of the strategic analysis on industrial mining and appreciates the opportunity to comment. Founded in 1970 and now a leading producer of industrial sand in North America, Unimin operates over 20 silica sand facilities located in 12 states, two of which are located in Wisconsin. Given Unimin's substantial experience we believe we can be helpful to the Department. We look forward to cooperatively working with the Department in its deliberations toward the completion of this study.

Unimin requests that the Department include in its review credible information/data during this analysis. Through our many years of operation, Unimin has played an active and innovative role as issues have been raised with our industry. Ambient air quality is one topic that has been a subject of public concern. Because of this, Unimin has undertaken ambient air monitoring programs at several of its facilities. Attached with the letter, as an example, is a presentation of the results of PM 4 Crystalline Silica ambient air monitoring study at our Utica Illinois facility. Our ambient air monitoring programs are ongoing and we would be happy to share that data with the Department as it becomes available.

Unimin is aware of several very competent studies on this topic that we hope the Department will utilize in this analysis. One such study is the voluntary ambient PM4 crystalline sampling program conducted by Dr. John Richards of Air Control Techniques on behalf of several silica sand facility operators in Wisconsin. The ongoing study is the largest set of ambient PM4 Crystalline Silica concentration data ever collected and contains numerous quality assurance measures, including those requested by the Wisconsin Department of Natural Resources.

Unimin understands that ambient air quality is but one of the many topics on our industry that the Department will be analyzing in its analysis, and because of the number of facilities we operate and length of time we've been in the industry, we feel we have much to contribute to the discussion. We

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www.unimin.com

ask that you keep us apprised of your efforts as this study continues as Unimin commits to being an active participant and source of unbiased information, as the Agency proceeds.

Sincerely,

Chris Axness
Regional General Manager

Enclosure

Minnesota Regional Office, 121 St. Andrews Ct. • Mankato, MN 56001 • Ph:507-386-2111 • Fx:507-386-2110 •
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Ambient Air Monitoring Program

Utica Facility

January 29, 2015

Wisconsin Department of Natural Resources - 170

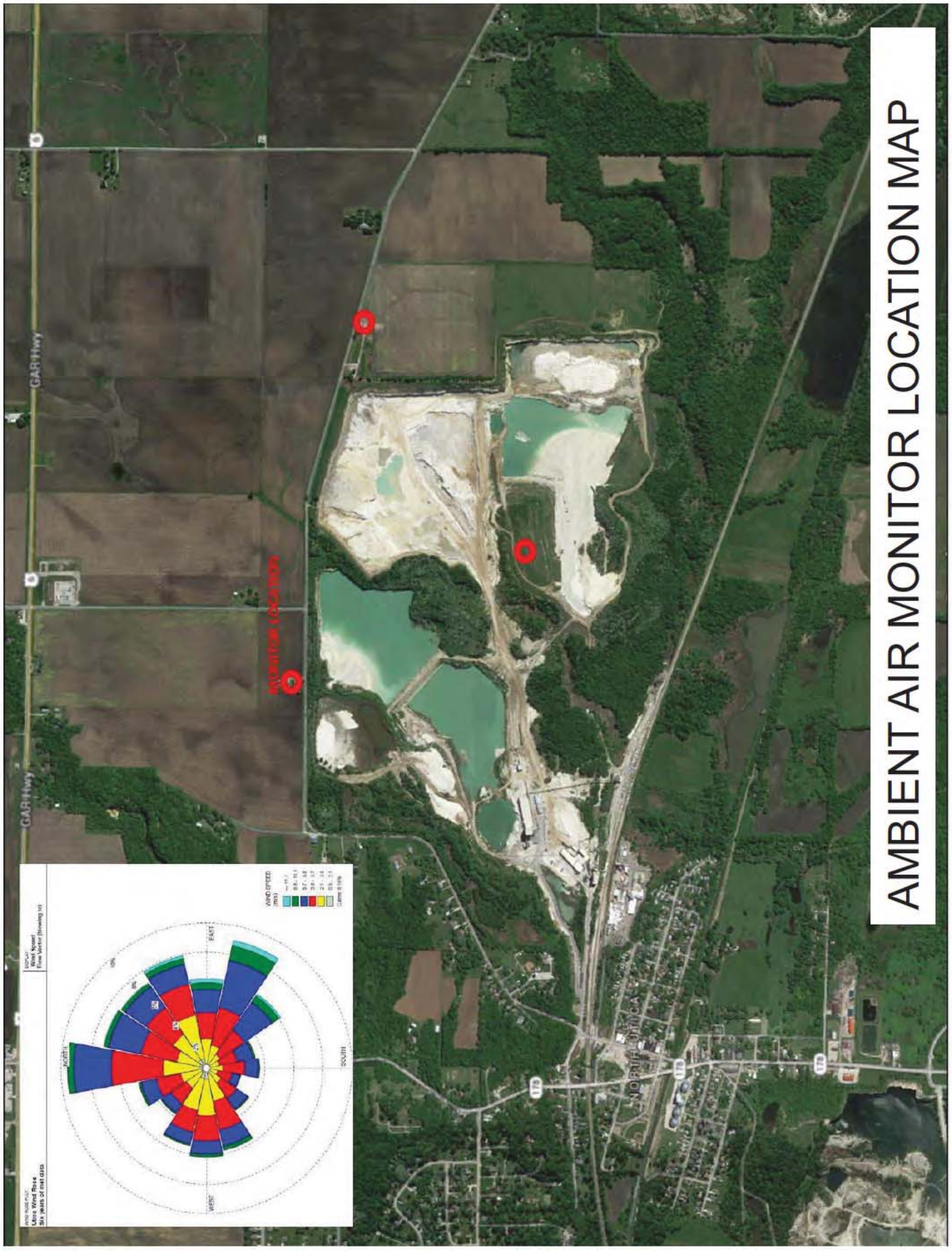
Industrial Sand Mining Public Scoping Comments - 2015

Background

- In 2013 Unimin voluntarily began development and construction of an air monitoring network around the Utica operation
- Village of Utica requested any available air monitoring data when it granted our request for a height variance in July 2014
- Responding to concerns from public and regulatory agencies about RCS impacts from industrial sand mines
- Actual monitoring began March 2014
- Data provided is from air samples taken between **March 6** and **November 25, 2014**

Background

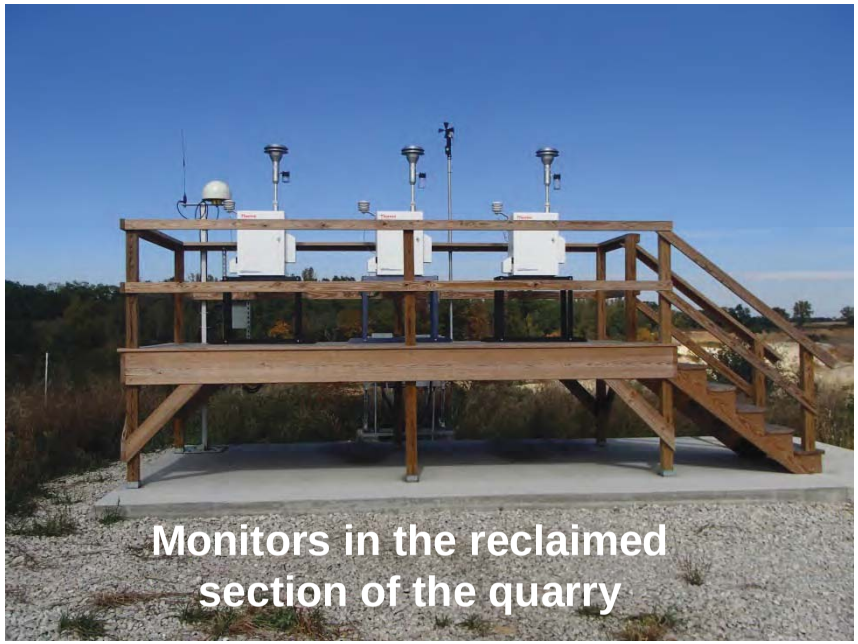
- **No** federally accepted monitoring protocol for RCS
- RCS monitoring plan is an adaptation of 40 CFR Part 50 - Appendix L – *Reference Methods for Determination of Fine Particulate Matter as PM2.5 in the Atmosphere*, modified to collect PM4, as developed by John Richards, Ph.D, P.E. & Air Control Techniques, P.C.)
- Using 1 in 6 day sample schedule based on EPA monitoring calendar
- Similar to multitude of programs overseen by Dr. Richards in Wisconsin and Minnesota


AMBIENT AIR MONITOR LOCATION MAP
MONITOR LOCATION
GAR Hwy
GAR Hwy
NORTH
EAST
SOUTH
WEST
WIND SPEED

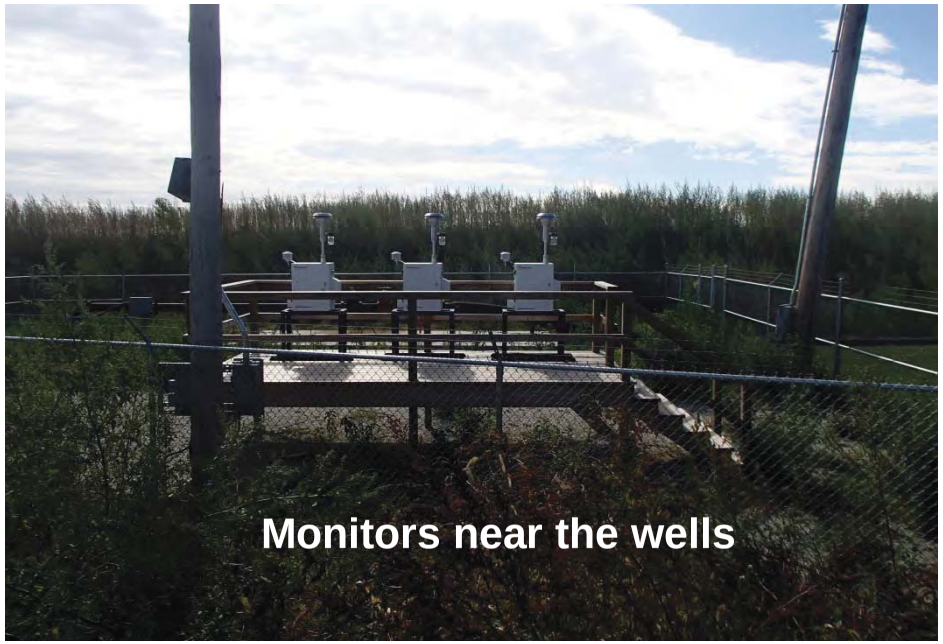
RCS Ambient Air Monitoring – Utica, IL

To date, results based on

- **45 sample days from March 6 – Nov. 25**
- **Produced 130 samples**
- **>3100 hrs. of sampling**



Monitors in the reclaimed section of the quarry



Monitors near the wells

RCS Ambient Air Monitoring – Utica, IL

Monitors on the Anderson property, north of 2803rd road

RCS Ambient Air Monitoring – Utica, IL

- Avg. concentration across all samples and sites = 0.4 µg/m³
- That is +/- 13 percent of the California and Minnesota Chronic Reference Level (proposed levels) of 3 µg/m³
- Analytical Detection Limit (ADL) is **0.005 mg** of CS dust in the dust collector, below which CS cannot be detected
- A sample at the ADL produces theoretical concentration of 0.3 µg/m³ over a standard sample period
- 88 of 130 (more than 67 percent) samples analyzed returned lab results below the ADL

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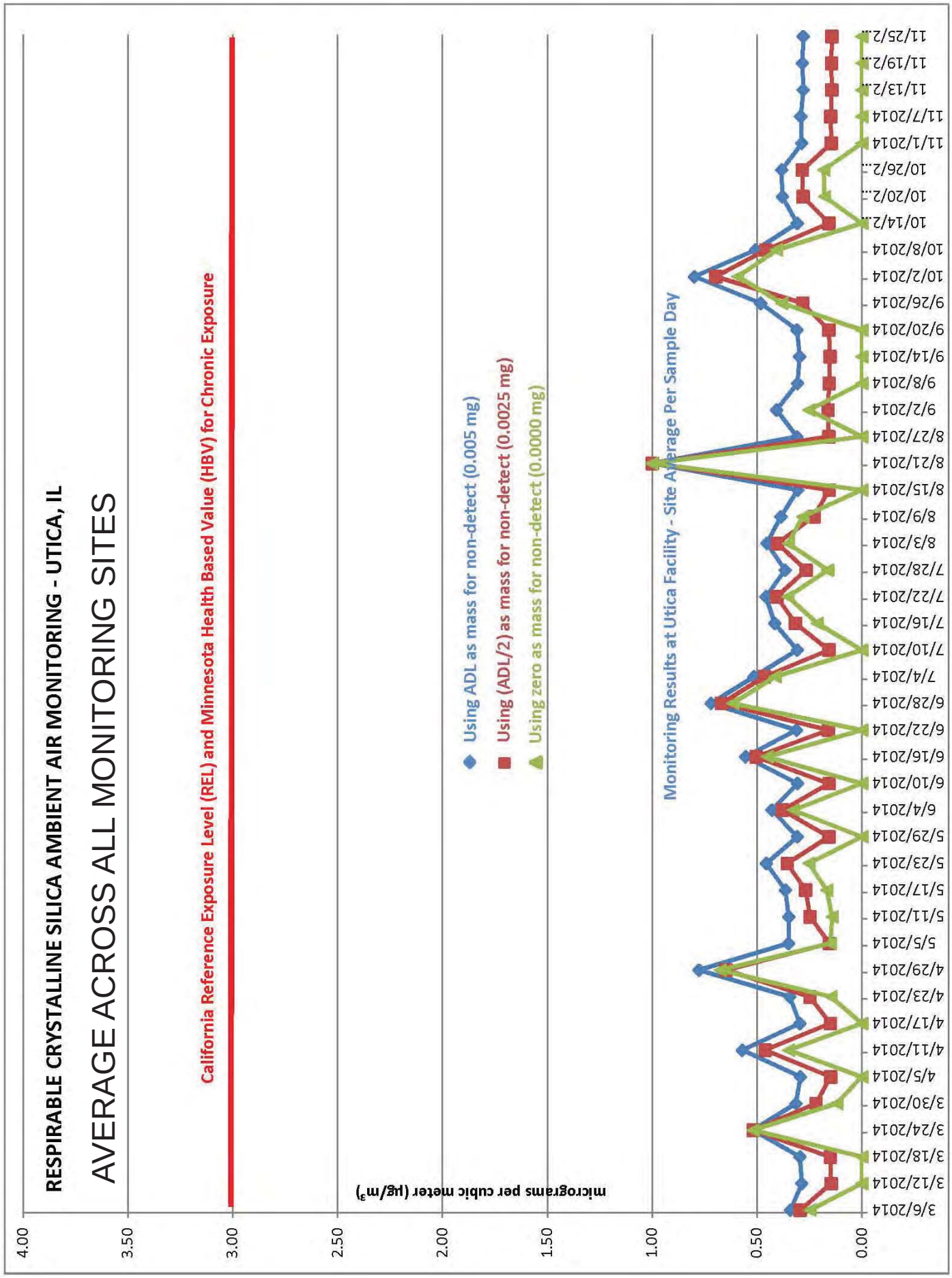
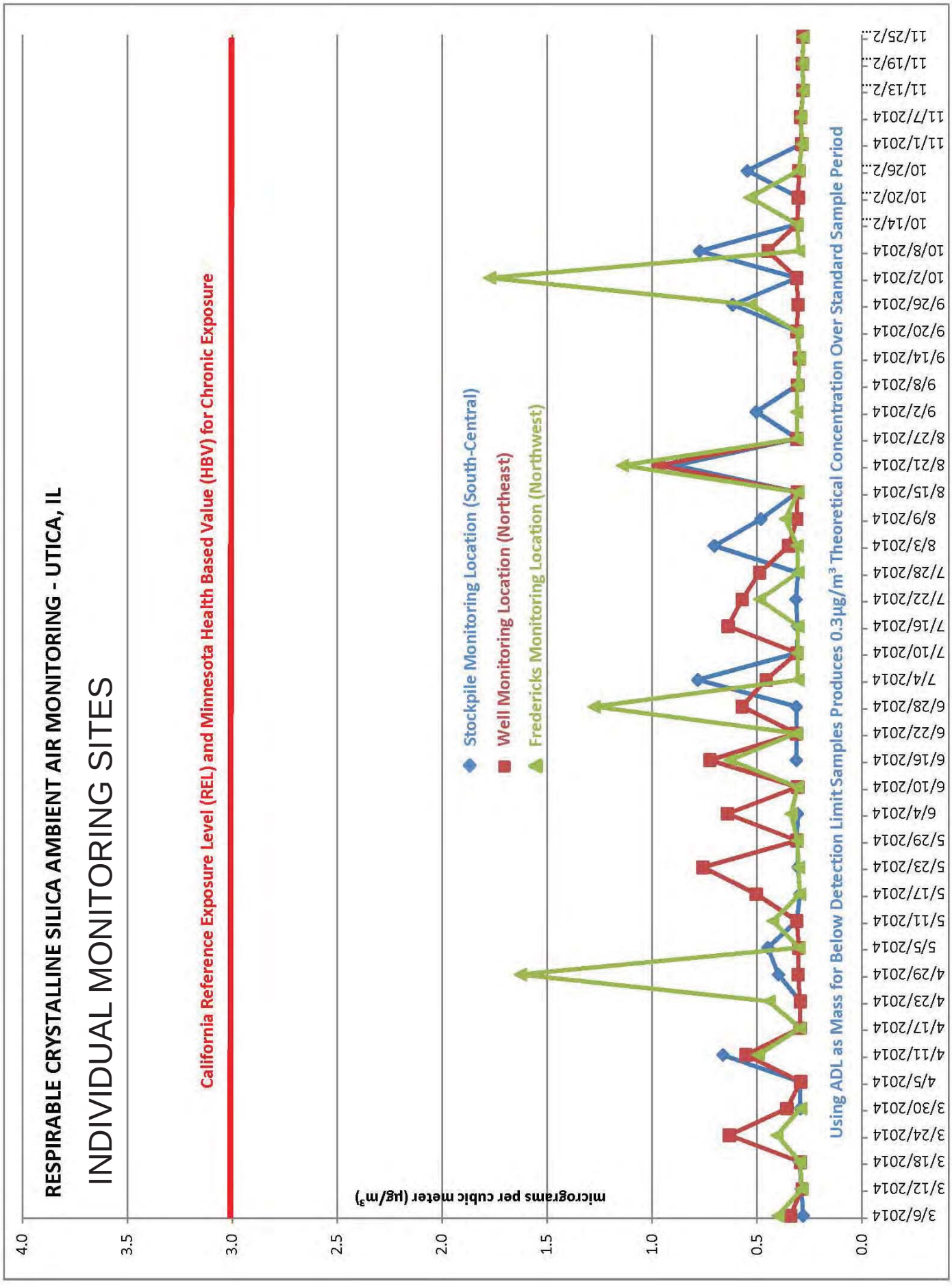

RESPIRABLE CRYSTALLINE SILICA AMBIENT AIR MONITORING - UTICA, IL
AVERAGE ACROSS ALL MONITORING SITES
California Reference Exposure Level (REL) and Minnesota Health Based Value (HBV) for Chronic Exposure
Using ADL as mass for non-detect (0.005 mg)
Using (ADL/2) as mass for non-detect (0.0025 mg)
Using zero as mass for non-detect (0.0000 mg)
Monitoring Results at Utica Facility - Site Average Per Sample Day
micrograms per cubic meter (µg/m³)
4.00
3.50
3.00
2.50
2.00
1.50
1.00
0.50
0.00
3/6/2014
3/12/2014
3/18/2014
3/24/2014
3/30/2014
4/5/2014
4/11/2014
4/17/2014
4/23/2014
4/29/2014
5/5/2014
5/11/2014
5/17/2014
5/23/2014
5/29/2014
6/4/2014
6/10/2014
6/16/2014
6/22/2014
6/28/2014
7/4/2014
7/10/2014
7/16/2014
7/22/2014
7/28/2014
8/3/2014
8/9/2014
8/15/2014
8/21/2014
8/27/2014
9/2/2014
9/8/2014
9/14/2014
9/20/2014
9/26/2014
10/2/2014
10/8/2014
10/14/2...
10/20/2...
10/26/2...
11/1/2014
11/7/2014
11/13/2...
11/19/2...
11/25/2...


RESPIRABLE CRYSTALLINE SILICA AMBIENT AIR MONITORING - UTICA, IL
INDIVIDUAL MONITORING SITES
California Reference Exposure Level (REL) and Minnesota Health Based Value (HBV) for Chronic Exposure
Stockpile Monitoring Location (South-Central)
Well Monitoring Location (Northeast)
Fredericks Monitoring Location (Northwest)
Using ADL as Mass for Below Detection Limit Samples Produces 0.3µg/m³ Theoretical Concentration Over Standard Sample Period
micrograms per cubic meter (µg/m³)
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
3/6/2014
3/12/2014
3/18/2014
3/24/2014
3/30/2014
4/5/2014
4/11/2014
4/17/2014
4/23/2014
4/29/2014
5/5/2014
5/11/2014
5/17/2014
5/23/2014
5/29/2014
6/4/2014
6/10/2014
6/16/2014
6/22/2014
6/28/2014
7/4/2014
7/10/2014
7/16/2014
7/22/2014
7/28/2014
8/3/2014
8/9/2014
8/15/2014
8/21/2014
8/27/2014
9/2/2014
9/8/2014
9/14/2014
9/20/2014
9/26/2014
10/2/2014
10/8/2014
10/14/2...
10/20/2...
10/26/2...
11/1/2014
11/7/2014
11/13/2...
11/19/2...
11/25/2...

RCS Ambient Air Monitoring – Utica, IL

For Sample Results Below ADL (Non-detect):

Mass Used For Site Average Calculation Site Average	Numeric Value	Resultant Site Average Since Start of Monitoring	Percentage of Health Based Value (3 µg/m³)
ADL	0.0049 mg	**0.4 µg/m³**	13%
ADL/2	0.0025 mg	**0.3 µg/m³**	10%
Zero	0.0000 mg	**0.2 µg/m³**	7%

Using ADL as resultant sample mass produces most conservative facility average

RCS Ambient Air Monitoring – Utica, IL

Notes:

- Results include local and regional background concentration in addition to process and quarry contributions from the facility
- To date, combined results so low that additional work to separate site impacts from background is unwarranted

Additional Ambient Air Monitoring (PM2.5 & PM10) – Utica, IL

- In September 2014 Unimin voluntarily expanded the scope of monitoring program to include PM2.5 & PM10 sampling at each monitoring site for comparison to the National Ambient Air Quality Standards (NAAQS) for PM2.5 & PM10
- Initial PM2.5 & PM10 available early 2015 after thorough QA/QC procedure

UNIMIN

Thank you

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An Introduction to the Economic Impacts of Industrial Silica Sand (Frac Sand) Mining

By Isaac Orr and Mark Krumenacher

Introduction

Industrial silica sand has been mined throughout the United States for more than a century. Until recently, this sand was primarily used for glassmaking, cores for molding metal castings at foundries, metal production, feedstock for household and industrial cleaners, construction supplies such as concrete, and a small portion of the sand was used for hydraulic fracturing, a technique used in oil and natural gas production.[1]

However, as production from conventional oil and natural gas fields declined, oil and natural gas producers developed a combination of horizontal drilling and hydraulic fracturing, commonly known collectively as hydraulic fracturing, or "fracking," to increase oil and natural gas recovery in rock formations such as shale and tight sandstones that had previously been too expensive to develop. This process consists of injecting water, sand, and chemical additives into these rock formations to break apart the rock, allowing the oil and natural gas to flow freely up to the surface.

The proliferation of hydraulic fracturing for oil and natural gas production has greatly increased the demand for industrial silica sand. This sand, commonly referred to as "frac sand" because of its use in the hydraulic fracturing process, has become a significant driver of economic growth, resulting in substantial increases in employment in the industrial sand industry. In Wisconsin, the nation's leading supplier of industrial sand, data from the U.S. Bureau of Labor Statistics (BLS) indicate industrial sand mining employed 189 people in the state in 2002.[2] The Wisconsin Economic Development Corporation estimates this number will grow to nearly 3,000 when existing and proposed mines become fully operational, representing a 15-fold increase in employment in the industry.[3]

Several reports have attempted to assess the economic benefits and costs of industrial sand mining in the Upper Midwest, each with their own strengths and shortcomings. Benefits of silica sand mining are often discussed in terms of creating high-paying opportunities for employment, increasing regional economic activity, generating tax revenues for state and local governments, and as a means of increasing economic diversity in rural communities that rely heavily on agriculture for income.

The costs of silica sand mining are often described in terms of opportunity costs to other industries, particularly tourism and agriculture. Additionally, silica sand mining has been

[1] National Industrial Sand Association, "What is Industrial Sand?" 2011, http://www.sand.org/what-is-industrial-sand.

[2] Kate Prengaman, "Frac Sand Boom Creates Thousands of Jobs," *The Appleton Post Crescent*, August 20, 2012, http://archive.postcrescent.com/article/20120820/APC0101/308200091/Frac-sand-boom-creates-thousands-jobs.

[3] *Ibid.*

compared to mining economies in other regions of country, including mining-dependent areas in the Iron Range of northern Minnesota, as indicating mining can result in "boom or bust" economic cycles and may not be a sound foundation for long-term economic prosperity.

This *Policy Study* will analyze the potential benefits and costs of industrial silica sand mining with a primary focus on the state of Wisconsin, because the state is the largest producer of industrial silica sand in the nation and accounts for approximately two-thirds of U.S. frac sand production.

Additionally, Wisconsin has strong agricultural and tourism sectors, and therefore the state provides valuable insight into claims industrial sand mining could negatively impact these two industries, resulting in negative-overall impacts in the rural counties in which mining occurs.

Economic Benefits of Industrial Silica Sand Mining

The rapid expansion of industrial silica sand production in response to demand for frac sand has been an engine for economic growth across the Upper Midwest, particularly in Wisconsin, which has experienced significant job growth in the industrial sand mining industry. These are high-paying jobs, exceeding the average per-capita income in the counties and communities in which they occur by 30 to 82 percent. In addition to creating thousands of direct jobs, the high earnings associated with frac sand mining jobs generate indirect and induced jobs in rural communities throughout the state.

As discussed earlier in this report, U.S. Bureau of Labor Statistics data show industrial sand mining employed 189 people in Wisconsin in 2002. Although specific employment and payroll data can be unavailable for rural areas to protect the confidentiality of local firms that may dominate a local economic sector, [4,] the Wisconsin Economic Development Corporation (WEDC) estimates the average frac sand processing facility creates 50-80 jobs and the average mine creates 10 jobs.[5] According to Wisconsin DNR data from May 1, 2014, there are currently 121 active and inactive sand mines (63 active mines, 58 inactive), 74 active and inactive sand processing facilities (45 active, 29 inactive), and 27 rail loading facilities in the state.[6]

Using WEDC estimates, 630 people are currently employed mining industrial silica sand in Wisconsin, and between 2,250 and 3,600 people are employed at industrial sand processing facilities throughout Wisconsin, putting estimates for current employment between 2,880 and 4,230 people. This total represents a 15- to 22-fold growth in industrial sand employment in a twelve-year period. Additionally, these numbers are conservative, as they do not include the

[4] Thomas Power, Ph.D., and Donovan Power, M.S., "The Economic Benefits and Costs of Frac-Sand Mining in West Central Wisconsin," prepared for the Wisconsin Farmers Union, the Wisconsin Towns Association, and the Institute for Agriculture and Trade Policy, May 2013, http://www.iatp.org/files/2013_05_30_FracSandMining_f.pdf.

[5]Wisconsin Department of Natural Resources, "Silica Sand Mining in Wisconsin," January 2012, http://dnr.wi.gov/topic/Mines/documents/SilicaSandMiningFinal.pdf.

[6] Wisconsin Department of Natural Resources, "Locations of Industrial Sand Mines and Processing Plants in Wisconsin," January 16, 2015, accessed February 28, 2015, http://dnr.wi.gov/topic/Mines/ISMMap.html.

number of people employed at the 27 rail-loading facilities located throughout the state or the indirect jobs created.

If all the permitted mine sites and processing facilities were fully operational, the industry would support an estimated 1,200 mining jobs and 3,700 to 5,900 jobs at processing facilities, for a total of 4,900 to 7,100 jobs directly supported by the sand mining industry. Again, these numbers do not account for jobs created by rail-loading facilities, nor for indirect jobs, so the total employment numbers are possibly larger.

WEDC estimates only consider direct employment; they do not take into account earnings or the multiplier effect, the number of indirect jobs and induced jobs created by industrial silica sand mining. Indirect jobs are created and supported by companies hiring workers to provide goods or services to industrial sand companies, such as firms that manufacture conveyor belts, sand processors, and heavy machinery. Additionally, WEDC figures to not account for induced jobs, which are created and supported by people employed in direct and indirect jobs spending their paychecks in the general economy at restaurants, grocery stores, movie theaters, auto dealerships, etc. These additional jobs, indirect and induced, are known as the multiplier effect.

Multipliers can be difficult to assess statistically, and they are sometimes misunderstood or misused through factors such as double counting or confusing multipliers with other economic measures such as turnover and value added. However, using IMPLAN (an economic modeling software for conducting economic impact analyses) to generate the multipliers resolves many of these concerns.[7]

To examine further the total economic impact of silica sand mining operations in Wisconsin, including earnings; direct, indirect, and induced employment; and the projected generation of state and local tax revenue during the construction and operations phases, we examine two economic impact analyses, one from Wood County, Wisconsin and the other prepared on behalf of AllEnergy Sands for a proposed mine located in Trempealeau County, Wisconsin.

Wood County, Wisconsin Economic Impact Analysis

In response to significant interest in silica sand mining for hydraulic fracturing in Wood County, Wisconsin, county policymakers sought to understand the economic impact of the development and expansion of frac sand mining by commissioning Economic Modeling Specialists Incorporated (EMSI) to conduct an economic impact study in 2011 examining the likely impact on job creation, earnings, and tax revenue generation for state and local governments, including the City of Marshfield, Wood County, Mid-State Technical College, and the Marshfield School District.

[7] Steven Deller, "Contribution of Agriculture to the Wisconsin Economy: Updated for 2012," *University of Wisconsin-Madison 2014 AAE Staff Paper Series,* 2014, http://wp.aae.wisc.edu/wfp/wp-content/uploads/sites/5/2014/09/Impact-of-Agriculture-2012-FINAL.pdf.

The study detailed the impact on employment, earnings, and tax revenue generation over three phases: Construction, expansion and operations, and full operation. For the sake of brevity, our report will detail only the construction and full-operation phases.

Construction of sand mining and processing facilities requires extensive capital investment. During the first 18 months of construction, processing-plant and rail construction (used for shipping processed sand) were projected to account for an initial investment of $86 million, with plant construction estimated to account for $65.2 million of this expenditure, and $20.8 million were projected to be spent on upgrading existing and the construction of new rail lines.[8] These initial investments in construction will generate significant multipliers.

EMSI converted spending figures for plant construction into earnings for industrial sand employees, to better capture the creation of new income in Wood County.[9] The conversion was made because although spending figures are always higher, earnings figures present a more accurate depiction of local economic impacts. Direct earnings for plant construction were found to be $30.2 million, and multiplier impacts on a variety of industries were projected to generate an additional $7.5 million in earnings, for a total effect of $37.8 million, as indicated in Fig. 1. In total, the initial construction phase, including plant and rail construction, were expected to generate a total of $49.95 million in additional earnings within the county.

Earnings Impacts of $65.2 Million Spending on Plant Construction

NAICS Code	Industry description	Initial Effects	Multiplier Effects	Total Effects
212322	Frac-Sands Processing	$0	$0	$0
212322	Frac-Sands Mining	$0	$0	$0
482112	Frac-Sands Ore Haulage	$0	$0	$0
21	All other Mining	$0	$45,754	$45,754
11	Agriculture, Forestry, Fishing and Hunting	$0	$46,908	$46,908
22, 23	Utilities, Construction	$30,273,845	$659,760	$30,933,605
31–33	Manufacturing	$0	$1,072,492	$1,072,492
42, 44, 45	Trade	$0	$1,366,327	$1,366,327
48, 49	Transportation and Warehousing	$0	$336,029	$336,029
51, 52, 53	Finance, Insurance, Information, Real Estate	$0	$708,988	$708,988
54, 55, 56	Professional, Management, Administrative Services	$0	$990,697	$990,697
61, 62, 71	Education, Health Care, Arts, Misc. Services	$0	$1,226,670	$1,226,670
72, 81	Accommodation, Food, Misc. Services	$0	$588,082	$588,082
90	Government	$0	$538,954	$538,954
	TOTAL	*$30,273,845*	*$7,580,661*	*$37,854,506*

Figure 1. The $65.2 million spent on plant construction was converted to earnings to provide a more accurate assessment of the real economic impacts to be expected from plant construction in Wood County, which exceed $37 million.

[8] Dr. Hank Robison and Timothy Nadreau *et al.,* "The Economic Impact of Frac Sand Mining, A Look at Jobs and Earnings in Wood County, Wisconsin," Economic Modeling Specialists Incorporated, September 30, 2011, http://wisconsinsand.org/assets/downloads/Econ-Impact-in-Wood-County.pdf.
[9] Ibid.

Projections estimate Wood County would receive significant numbers of direct, indirect, and induced employment from the initial construction phase. During the first year, 6,126 full-year jobs were estimated to be created across a variety of industries (see fig. 2). The projected jobs would carry over into year two, but because the construction period is 128 months, the jobs number from year one was halved, accounting for 308 construction jobs. Although these jobs would not be permanent, they would essentially be "shovel-ready" projects that would have a significant impact on the state and local economy throughout the construction period.

Plant Construction

NAICS Code	Industry description	Year 1	Year 2
212322	Frac-Sands Processing	0	0
212322	Frac-Sands Mining	0	0
482112	Frac-Sands Ore Haulage	0	0
21	All other Mining	0	0
11	Agriculture, Forestry, Fishing and Hunting	1	1
22,23	Utilities, Construction	480	240
31-33	Manufacturing	14	7
42, 44,45	Trade	28	14
48,49	Transportation and Warehousing	6	3
51, 52, 53	Finance, Insurance, Information, Real Estate	11	5
54, 55, 56	Professional, Management, Administrative Services	19	10
61, 62, 71	Education, Health Care, Arts, Misc. Services	32	16
72,81	Accommodation, Food, Misc. Services	18	9
90	Government	8	4
	TOTAL	*616*	*308*

Figure 2. Construction spending will generate a wide variety of employment opportunities across a diverse spectrum of industries.

After the processing plants and mines reach the full operations phase, projections find the direct earnings from jobs in the frac sand industry would be $44.85 million, with an estimated earnings multiplier of 1.3, meaning for every $1,000 in labor earnings in the frac sand mining industry, another $310 would be generated within the county economy.[10] Total earnings impacts were expected to be $58.74 million when direct, indirect, and induced earnings are taken into consideration.

The economic analysis shows silica sand mining, processing, and hauling were projected to be a substantial source of job growth. Direct employment in frac-sand-related industries, which include jobs at processing plants, mines, and hauling frac sand, were expected to employ 598 people with average annual earnings at approximately $75,000 per worker, including employee benefits. These earnings are significantly higher than the average per-capita income of Wood

[10] Thomas Power, Ph.D., and Donovan Power, M.S., *supra* note 4.

County residents, exceeding the average earnings of $41,307 by nearly 82 percent.[11] Because of the high pay associated with these jobs, the employment multiplier was 1.55, meaning for every two jobs in the frac-sand production industry, one additional job was created in the general economy of the county.[12]

In total, job creation during the full-operations phase is expected to employ 929 people in direct, indirect, and induced jobs, and unlike the construction phase, these jobs are permanent in nature (see fig. 3). Additionally, these multiplier jobs pay an average of $42,000 per year, significantly higher than the average yearly earnings of $25,548 paid in Wood County by jobs supported by the tourism industry, for example (see fig. 11).[13]

Phase 3 Operations Job Impacts by Year

NAICS CODE	Industry Description	Year 8	Year 9	Year 10
212322	Frac-Sands Processing	374	374	374
212322	Frac-Sands Mining	112	112	112
482112	Frac-Sands Ore Haulage	112	112	112
21	All other Mining	0	0	0
11	Agriculture, Forestry, Fishing and Hunting	4	4	4
22,23	Utilities, Construction	15	15	15
31-33	Manufacturing	11	11	11
42,44,45	Trade	71	71	71
48,49	Transportation & Warehousing	4	4	4
51,52,53	Finance, Insurance, Information, Real Estate	37	37	37
54,55,56	Professional, Management, Administrative Services	37	37	37
61,62,71	Education, Health Care, Arts, Misc. Services	75	75	75
72,81	Accommodation, Food, Misc. Services	64	64	64
90	Government	11	11	11
	TOTAL	*929*	*929*	*929*

Figure 3. After all construction operations are complete in year eight, a total of 598 direct jobs will be created by frac sand mining, hauling, and processing in Wood County. In total, sand-mining activities will support 929 jobs.

Tax revenues for the construction phase are expected to total $1.46 million in the first year, growing to $2.58 million per year after all sand processing facilities are in the full-operation phase (see fig. 4). It will be up to local policymakers to determine the best use of the new projected revenues generated from silica sand operations: Additional projects and programs within local government units, offsetting expenses for infrastructure upkeep, recreational programs such as summer sports leagues, after-school programs, property tax relief, or other options of their choosing.

[11] Wisconsin Department of Workforce Development, "Wood County Summary," accessed March 9, 2015, http://worknet.wisconsin.gov/worknet/jsprofile_results.aspx?menuselection=gp&area=141.
[12] Thomas Power, Ph.D., and Donovan Power, M.S., *supra* note 4.
[13] Wisconsin Department of Tourism, "County Total Economic Impact," Data from 2012-2013, accessed March 8, 2015, http://industry.travelwisconsin.com/research/economic-impact.

New Tax Revenues from Frac Sand Development

CHANGE IN TAX REVENUES	1	2	3	4	5	6	7	8		Year n*
City of Marshfield	$426,277	$398,719	$548,285	$618,348	$688,411	$758,474	$772,759	$752,012		$752,012
Wood County	$220,751	$206,479	$283,933	$320,216	$356,499	$392,781	$400,179	$389,435		$389,435
Mid-State Technical College	$77,072	$72,090	$99,132	$111,799	$124,467	$137,135	$139,718	$135,966	...	$135,966
Marshfield School District	$434,365	$406,284	$558,687	$630,080	$701,472	$772,865	$787,421	$766,280		$766,280
Other	$306,862	$287,024	$394,691	$445,128	$495,564	$546,000	$556,283	$541,348		$541,348
TOTAL	*$1,465,327*	*$1,370,596*	*$1,884,728*	*$2,125,571*	*$2,366,413*	*$2,607,255*	*$2,656,358*	*$2,585,041*		*$2,585,041*

Figure 4. Frac sand mining will generate more than $2.5 million per year for government units in Wood County, with the vast majority of revenue directed to the City of Marshfield and the Marshfield School District.

A brief follow-up report to this analysis, by Environmental Modeling Specialists Incorporated (the company that conducted the economic analysis), was published in January of 2015 with the benefit of three years of hindsight to compare the projected impacts of the economic analysis with real-world observations. In this report, Jason Angell, Marshfield Director of Planning and Economic Development, confirmed the analysis provided an accurate range of results and the county economy is tracking with the report's suggestions—unemployment is down, and the county's population has grown.[14]

It must be noted only three of the four industrial silica sand processing plants modeled in the report were constructed, and as a result 170 people were employed at sand processing plants in September 2014, approximately 21.6 percent lower than the 217 jobs projected in the analysis. This could also impact the number of people employed in sand mining and hauling to a similar degree, though this is merely speculative and not supported by real-world data.

AllEnergy Sand Economic Impact Analysis

As seen in the Wood County study, industrial silica sand operations have a significant effect on employment, both through the creation of direct jobs and through the multiplier. In addition, these jobs greatly exceed the per-capita income of other Wood County residents. Similar results were obtained in a March 2014 economic impact analysis prepared by Dr. Logan Kelly, a professor of economics at the University of Wisconsin-River Falls, using the IMPLAN economic modeling software to examine the county and statewide impact of the construction of a proposed industrial silica sand mine in Trempealeau County, Wisconsin to be operated by AllEnergy Sand.[15]

[14] Amanda Ryan, A Spot-On Assessment: The Impact of Frac Sand Mining in Wisconsin," January 15, 2015, http://www.economicmodeling.com/2015/01/27/a-spot-on-assessment-emsi-measures-impact-of-frac-sand-mining-in-wisconsin/.

[15] Dr. Logan Kelly, "ALL Energy Fracture Mine Economic Study," Center for Economic Research, University of Wisconsin-River Falls, March 2014, https://www.heartland.org/sites/default/files/all_energy_fracture_sand_mine_economic_study_2014.pdf.

The analysis found normal mine operations would generate 71 permanent jobs within the county through direct, indirect, and induced employment, with average annual earnings from direct jobs of $48,711, 30 percent above the Trempealeau County average per-capita income. Additionally, 131 permanent jobs would be created throughout the state, with average earnings in direct employment of $76,559 per worker, exceeding the statewide average per-capita income of $42,121 by 81 percent, nearly double the statewide average.

Construction is expected to take five months to complete, at an estimated total cost of $47.6 million. Throughout the construction of the mine, 65 people will be employed directly in Trempealeau County (see fig. 5), with average earnings of approximately $39,224. In addition, fourteen indirect jobs and ten induced jobs will be created in the county, with average earnings of $39,609 and $33,209, respectively. Statewide, the construction of the mine will lead to 160 direct jobs, with average earnings of $61,100; 63 indirect jobs, with average earnings of $54,290; and 84 induced jobs, with average earnings of $42,545

Summary of Economic Impact of Construction Phase

Statewide

Impact Type	Employment	Labor Income	Output
Direct	160	9,775,694.31	23,825,398.95
Indirect	63	3,420,317.69	9,519,789.99
Induced	84	3,573,794.76	10,586,232.41
Total Effect	**307**	**16,769,806.76**	**43,931,421.35**

County

Impact Type	Employment	Labor Income	Output
Direct	65	2,549,570.60	8,249,999.64
Indirect	14	554,527.82	1,883,582.08
Induced	10	332,093.69	1,213,119.83
Total Effect	**88**	**3,436,192.11**	**11,346,701.54**

Figure 5. During the five-month construction period, a total of 225 direct, 77 indirect, and 94 induced jobs will be created at the state and county levels, with multiplier effects of 1.91 and 1,35, respectively.

During the first full year of mine operations, this facility is projected create 42 direct jobs in Trempealeau County with a total labor income of approximately $2 million, resulting in average annual incomes of $48,771 per worker (see fig. 7). This figure exceeds the county-wide average per-capita income of $37,494 by 30 percent, a substantial margin.[16] Additionally, these jobs are estimated to have an employment multiplier of 1.69 at the county level, resulting in the creation

[16] Wisconsin Department of Workforce Development, "Trempealeau County Summary," accessed March 8th, 2015, http://worknet.wisconsin.gov/worknet/jsprofile_results.aspx?menuselection=gp&area=121.

of 19 indirect and 10 induced jobs with average annual incomes of $52,015 and $32,361, respectively, bringing the total number jobs supported by the AllEnergy facility to 71 (see fig. 6).

Summary of Economic Impact of Normal Operations

Statewide

Impact Type	Employment	Labor Income	Output
Direct	44	3,368,602.37	29,999,999.99
Indirect	47	2,737,033.59	9,048,696.89
Induced	39	1,656,853.92	4,908,138.67
Total Effect	**131**	**7,762,489.89**	**43,956,835.56**

County

Impact Type	Employment	Labor Income	Output
Direct	42	2,048,382.84	28,171,618.94
Indirect	19	988,292.98	4,030,540.18
Induced	10	323,613.17	1,180,789.35
Total Effect	**71**	**3,360,288.99**	**33,382,948.48**

Figure 6 The AllEnergy frac sand facility is projected to support a total of 131 jobs throughout the state and 71 jobs throughout Trempealeau County, with employee incomes of approximately $7.76 million and $3.36 million, respectively.

Statewide, the full operation of the mine will create 44 direct jobs, with labor compensation of $3,386,382, resulting in average annual earnings of $76,559 per worker, exceeding the statewide average per-capita income of $42,121 by 81 percent, nearly double the statewide average. In addition these jobs are estimated to have a multiplier of 2.97, resulting in the creation of 47 indirect jobs and 39 induced jobs throughout the state, with annual average earnings of $51,787 and $42,483, respectively. This statewide multiplier is slightly higher than the statewide multiplier of 2.2 documented in other reports, but it is generally consistent with the findings of other economic analyses conducted on this subject.[17]

[17] Thomas Power, Ph.D., and Donovan Power, M.S., *supra* note 4.

Impact of Normal Operations by Sector

Statewide

Description	Employment	Labor Income	Output
Mining and quarrying sand, gravel, clay, and ceramic and refractory minerals	45.5	3,482,787.96	30,328,778.76
Architectural, engineering, and related services	6.5	391,037.06	696,497.58
Food services and drinking places	6.0	114,153.41	323,095.70
Securities, commodity contracts, investments, and related activities	4.7	229,859.36	704,929.20
Support activities for other mining	4.4	64,643.97	1,192,966.36
Management of companies and enterprises	3.5	382,274.13	732,579.59
Transport by truck	3.3	195,808.85	485,321.56
Monetary authorities and depository credit intermediation activities	2.8	196,450.16	884,062.01
Wholesale trade businesses	2.6	196,796.83	502,137.95
Private hospitals	2.5	165,023.82	340,989.30

County

Description	Employment	Labor Income	Output
Mining and quarrying sand, gravel, clay, and ceramic and refractory minerals	38.4	1,973,885.24	24,999,791.92
Architectural, engineering, and related services	2.4	101,315.15	212,462.35
Food services and drinking places	2.0	26,721.98	94,931.77
Transport by truck	1.9	91,899.19	255,389.28
Monetary authorities and depository credit intermediation activities	1.1	60,431.85	334,288.70
Securities, commodity contracts, investments, and related activities	1.1	15,916.06	125,892.57
Civic, social, professional, and similar organizations	0.9	15,621.15	28,032.56
Management of companies and enterprises	0.9	46,159.92	132,322.83
Services to buildings and dwellings	0.8	12,364.49	36,879.72
Private hospitals	0.7	43,554.65	94,801.88

Figure 7.[18] *Many conversations about direct employment in the industrial silica sand mining industry tend to focus on jobs in the active mining, transporting, and processing of sand. However, professional services such as architectural and engineering jobs are required to ensure mining operations are constructed and operated in an environmentally responsible manner.*

Reclaiming the mine, which will be an ongoing process, will begin one year after normal operations commence, and will directly add seven jobs statewide and four jobs within the county, with average earnings of $55,018 and $46,791, respectively. Additionally, six jobs will be created statewide through the multiplier, and two jobs will be created at the county level, with

[18] Dr. Logan Kelly, "ALL Energy Fracture Mine Economic Study," Center for Economic Research University of Wisconsin-River Falls, March 2014, https://www.heartland.org/sites/default/files/all_energy_fracture_sand_mine_economic_study_2014.pdf.

total employment at the state and county level for direct, indirect, and induced jobs constituting thirteen and six, respectively.

Finally, normal operations of the mine will generate approximately $1.3 million in annual tax revenue and reclamation will generate another $61,000 after the first full year of operation. It must be noted these figures are estimates of total tax revenue, which includes social insurance and other federal taxes, so not all of this revenue will be realized by state and local governments.

In conclusion, industrial sand mining has been a source of significant employment growth in the state of Wisconsin, and estimates indicate the industry will directly employ 4,910 to 7,130 people if all permitted mines and processing facilities become operational. Additionally, the high wages paid by these jobs (30-82 percent higher than the per capita income in Trempealeau and Wood counties, respectively) will create a significant number of direct and indirect jobs. Sand mining will also be source of significant tax revenue for state and local governments.

Economic Diversification

A report commissioned in part by the Wisconsin Farmers Union (WFU) suggests the high wages paid by jobs in mining and transportation are likely to compete successfully for local workers that have the necessary skills for these jobs. That could make it more difficult and costly for other local businesses to hire equally qualified workers, which could raise costs, making it more difficult for them to earn a profit, potentially undermining the diversity and vitality of the local economy.[19] It is true industrial sand jobs will likely draw qualified employees from other businesses, but the WFU analysis fails to acknowledge the vast majority of sand producing counties already lack economic diversity.

Wisconsin relies heavily on agriculture as a source of employment, with this sector accounting for 11.9 percent of all jobs in the state.[20] Rural communities in western Wisconsin are even more dependent on on agriculture as a source of employment than the statewide average, as six sand-producing counties (Barron, Buffalo, Clark, Jackson, Pepin, and Trempealeau) derive more than 20 percent of their total employment from this sector, and Clark County relies on agriculture for 46 percent of the total jobs in the county (see fig. 8). Of the 20 sand-producing counties, only three (Eau Claire, Outagamie, and Wood), have agricultural employment rates below the state average.

[19] Thomas Power, Ph.D., and Donovan Power, M.S., *supra* note 4.

[20] Steven Deller, "Contribution of Agriculture to the Wisconsin Economy: Updated for 2012," *University of Wisconsin-Madison 2014 AAE Staff Paper Series,* 2014, http://wp.aae.wisc.edu/wfp/wp-content/uploads/sites/5/2014/09/Impact-of-Agriculture-2012-FINAL.pdf.

County	Total Jobs	Agriculture Jobs	Agriculture Percent of All Jobs
Barron County	28,781	8,231	29
Buffalo County	8,435	3,046	36
Burnett County	6,820	848	12.4
Chippewa County	31,660	4,388	14
Clark County	16,905	7,696	46
Columbia County	29,006	4,528	16
Crawford County	10,460	1,488	14
Dunn County	21,245	3,881	18
Eau Claire County	70,107	4,481	6
Green Lake County	9,769	1,463	15
Jackson County	11,513	2,543	22
Monroe County	24,727	4,281	17
Outagamie County	124,258	11,593	9.3
Pepin County	3,266	1,035	31.7
Pierce County	14,369	2,378	16
Polk County	20,122	3,693	18.4
Portage County	43,167	5,551	12.9
Trempealeau County	16,829	4,778	28
Waupaca County	25,734	4,427	17
Wood County	50,781	4,616	9.1
Total	601,613	92,558	15.38

Figure 8. Data compiled from the University of Wisconsin-Extension County Impact Reports demonstrate silica sand producing counties rely heavily on agriculture as a source of employment. Several frac sand counties depend on agriculture for more than 20 percent of the total jobs in the county. Clark County relies on agriculture for 46 percent of the total jobs in the county, suggesting this area lacks economic diversity.[21]

These numbers confirm agriculture is and will continue to be an important part of the Wisconsin economy. They also indicate western Wisconsin, including many sand-producing counties, already lacks economic diversity. Agriculture is a volatile industry, as commodity prices can fluctuate drastically from year to year based on several inherently unpredictable factors such as weather conditions, insects, crop disease, and market forces and crop yields around the world.

When commodity prices are low, farmers and others employed in the agricultural sector have less money to spend on other goods, which affects retail and other establishments in rural communities. Industrial sand mining presents an opportunity for economic diversification in some of the counties most dependent on agriculture, because many of the best sand deposits are located in areas that are the most reliant on agricultural jobs (see fig. 9).

[21] University of Wisconsin Extension, "County Impact Reports," accessed March 11, 2015, http://www.uwex.edu/ces/ag/wisag/.

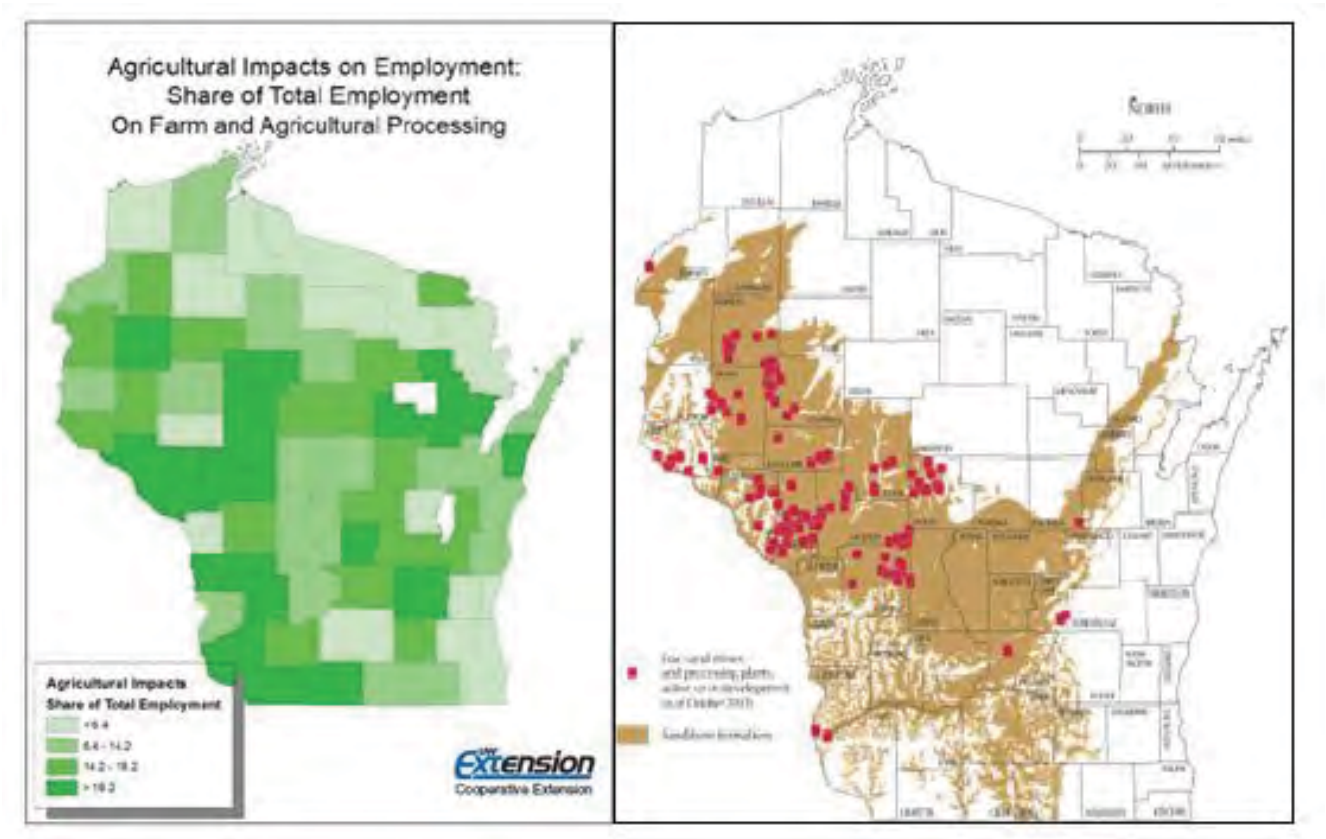
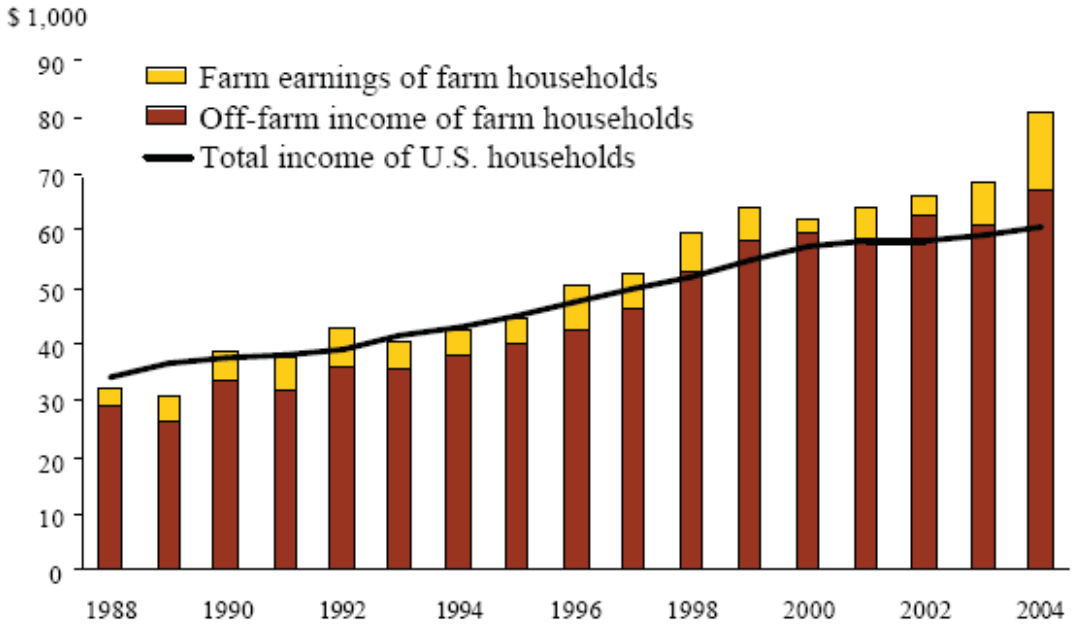


Figure 9. Many counties with significant levels of frac sand development are also the most heavily reliant on agriculture as a source of employment. Red squares indicate sand mining operations, and counties colored dark green in the illustration derive more than 19.2 percent of their total employment from the agricultural sector, suggesting frac sand mining will have a diversifying effect on these counties. (Note: If anyone wants this figure to look more professional, I can provide the images to Kevin).

Jobs in industrial sand mining may become increasingly important in rural communities because a growing number of farm households increasingly rely on income from nonfarm sources. In recent years, 85 to 95 percent of farm household income has come from off-farm sources such as employment earnings, other business activities, and unearned income (see fig. 10).[22]

[22] United States Department of Agriculture, "Family Farm Income," Farm Bill Forum Comment Summary and Background, accessed March 11, 2015, http://www.usda.gov/documents/FARM_FAMILY_INCOME.doc.



Source: Farm Costs and Returns Survey (1988-95) and Agricultural Resource Management Survey (1996-2004), Economic Research Service

Figure 10. On-farm earnings are subject to considerable fluctuation based on a variety of factors, but in general farmers increasingly depend on nonfarm income for financial wellbeing.

This trend is especially pronounced among family farms, as U.S. Department of Agriculture (USDA) data show for the 82 percent of U.S. farming operations that have annual sales of $100,000 or less, off- farm income typically accounts for all but a negligible amount of farm household income.[23] As a result, for the majority of U.S. farm households the availability of off-farm income is a more significant factor for financial wellbeing than are returns on farm production.

The increasing importance of nonfarm employment could make jobs at industrial sand facilities an attractive option for off-farm employment for farm operators with experience with heavy machinery. The lack of economic diversity in many rural communities provides few opportunities outside the agricultural sector or with earnings comparable to those for industrial silica sand mining jobs.

Economic Costs of Industrial Silica Sand Mining

The potential economic costs of industrial sand mining are often described in terms of opportunity costs to other sectors of the economy, particularly tourism and agriculture, and concerns industrial silica sand mining could jeopardize western Wisconsin's existing economic vitality.[24] Other potential economic costs of industrial sand mining have been most thoroughly

[23] *Ibid.*

[24] Kate Prengaman, "Report: 'Little Impact' on Wisconsin From Frac Sand Mining Jobs," Wisconsinwatch.org, May 16, 2013, http://wisconsinwatch.org/2013/05/little-impact-from-frac-sand-jobs/.

discussed in a study by Thomas and Donovan Power of Power Consulting, Inc. for the Wisconsin Farmers Union, the Wisconsin Town's Association, and the Institute for Agriculture and Trade Policy, titled "The Economic Benefits and Costs of Frac-Sand Mining in West Central Wisconsin."

The Power Consulting Inc. study draws comparisons to previous mining experiences in Wisconsin and mining-dependent areas of the country, such as the Iron Range of northern Minnesota and coal-producing communities in Appalachia, in an attempt to provide historical context Power Consulting, Inc. claimed is relevant in determining whether industrial sand mining will be a foundation for which long-term economic prosperity is built.[25]

Additionally, Power Consulting Inc. addresses economic leakages as they pertain to mining communities in rural areas, with the report suggesting many of the earnings from high-paying industrial sand jobs will be spent outside the communities in which mining is occurring.

Our analysis of the potential economic costs of sand mining examines the impact of sand mining on tourism in sand-producing counties and evaluates the potential economic costs discussed in the Power and Power report.

Impact on Tourism

Perhaps the most commonly perceived economic cost of industrial silica sand mining in Wisconsin is the potential to make mining communities less attractive to tourists. Tourism is a major source of employment in Wisconsin. Data from the Wisconsin Department of Tourism indicate the tourism sector supported 185,495 direct, indirect, and induced jobs in 2013, accounting for 7.8 percent of all employment in the state.[26] Tourism was also responsible for generating $1.3 billion in state and local tax revenues.

Groups opposed to mining often portray mining as incompatible with tourism.[27] Among the primary concerns are traffic congestion and noise from increasing numbers of trucks hauling sand, the potential loss of scenic beauty from hills and farm fields being converted to mining, and the potential impact of sand mining on local air and water quality will make mining communities less desirable places for tourism and recreation.

Although factors such as truck traffic, noise, and land use changes could conceivably alter tourism patterns or affect tourism revenue, thus far these concerns have been based on speculation and anecdotal evidence and have yet to be supported by tourism data or other empirical evidence. To evaluate whether industrial silica sand mining has in fact resulted in an actual loss of tourism dollars within silica sand mining communities, we obtained tourism data

[25] Thomas Power, Ph.D., and Donovan Power, M.S., *supra* note 4.
[26] Wisconsin Department of Tourism, "The Power of Tourism," 2014, http://industry.travelwisconsin.com/uploads/medialibrary/e4/e42c3872-f898-46f9-9c35-6aab8fef44c3-power-of-tourism-fact-sheet-2014.pdf/

[27] Kate Prengaman, "Conference Draws 50 Frac Sand Protestors," Wisconsingwatch.org, October, 2, 2012, http://wisconsinwatch.org/2012/10/conference-draws-50-frac-sand-protesters/.

from the Wisconsin Department of Tourism for the years 2010 through 2013, to analyze trends in Wisconsin's twenty silica sand producing counties.

Despite fears sand mining will result in dramatic losses in the tourism-related economy, analysis of Wisconsin Department of Tourism data shows otherwise, as a majority of sand-producing counties experienced growth in all tourism growth metrics between 2010 and 2013 (see fig. 11).

Direct visitor spending increased in 95 percent of the state's silica-sand producing counties (19 of 20 counties) between 2010 and 2013, with 80 percent (16 of 20 counties) registering double-digit growth as a percentage of total visitor spending. Burnett County, the only county that experienced a decline in total visitor spending, had a 1.9 percent decline with spending falling from $21.9 million in 2010 to $21.45 million in 2013. This data suggests industrial sand mining and related activities have not been a deterrent to travelers visiting sand-producing counties and generating income for tourism-related industries.

Total employment increased in a majority of frac sand producing counties, as 60 percent of these counties experienced increases in the number of jobs supported by tourism-related employment (see fig. 11). It is important to note tourism employment numbers from the Wisconsin Department of Tourism include direct, indirect, and induced jobs, and as such when comparing tourism employment with the number of jobs produced by industrial sand operations, the jobs created through the multiplier (indirect and induced) must be used in order to provide an "apples-to-apples" comparison.

For example, sand mining in Wood County is projected to create 598 direct jobs, and another 331 indirect and induced jobs, for a total increase of 929 jobs. Tourism in Wood County supported 2,080 jobs in Wood County. When comparing the number of jobs generated directly by silica sand mining operations to the total number of jobs supported by tourism (598 jobs compared to 2,080), the total impact of sand mining appears modest, accounting for 28.75 percent as many jobs as tourism. But incorporating the indirect and induced jobs generated by silica sand production for an apples-to-apples comparison shows the industrial sand industry supports nearly half (44.6 percent) as many jobs as the tourism industry.

Total labor income increased in 85 percent of sand-producing counties between 2011 and 2013. Figures from 2011 are used in this metric because total labor income was not a category used by the Wisconsin Department of Tourism in 2010, and as such 2011 was the earliest year this statistic was available. Although only 60 percent of counties experienced gains in the number of jobs supported by the tourism industry, nearly all sand-producing counties experienced gains in the level of income earned by the people holding these jobs. That demonstrates people working in tourism-related industries earned more money during the period of industrial sand expansion (see fig. 11).

Because of the high wages paid by the industrial sand industry, its contribution to the total labor earnings for the communities in which industrial sand production occurs is, as a percentage of total earnings, larger than its effect on employment. For example, in Trempealeau County, the AllEnergy facility would support total earnings of approximately $3.6 million for 71 employees in direct, indirect, and induced jobs (see fig. 6). In 2013, tourism supported a total of 371 jobs

with total labor compensation of $7.25 million in the county. As a result, although the AllEnergy facility would support approximately 19 percent as many jobs as the tourism industry, the total earnings generated by these jobs account for approximately 48 percent as much as the earnings generated by tourism-supported jobs.

State and local tax revenues generated from tourism-supported industries increased in 90 percent of industrial sand producing counties, with very modest declines experienced in Jackson County and a decline of approximately $50,000 in revenue for Burnett County, which has been a consistent outlier in all categories of this analysis. Monroe County experienced the largest increase in tourism-related revenue, as state and local taxes increased by more than 14 percent, from $8.1 million in 2010, to $9.5 million in 2013 (see fig. 11).

Per capita income for tourism-supported jobs increased in 95 percent of sand-producing counties, with Crawford County the only one experiencing a decline. The per capita income statistic begins in 2011 because that is the first year the total labor income statistic was available. These results should not necessarily be surprising, as direct visitor spending increased in 95 percent of counties and total employment increased in 60 percent of the counties examined, suggesting businesses earned more money and hired fewer workers, but paid their workers higher wages, during this period.

Incomes earned by employees in tourism-related jobs in silica sand producing counties were generally significantly lower than state and county averages, with annual incomes ranging from approximately $16,500 in Jackson County (the county with the lowest annual per-capita tourism income) to approximately $25,5000 in Wood County (the county with the highest annual per-capita tourism income).

Tourism Impacts

Wisconsin and Silica Sand Producing Counties - Alphabetical

	Direct Visitor Spending			Total Employment-Direct, Indirect, Induced			Total Labor Income*			State and Local Taxes			Per Capita Income*			Tourism Jobs		
	Millions		%	Total		%	Millions		%	Millions		%	Dollars		%	Jobs		%
County	2010	2013	Change	2010	2013	Change	2011	2013	Change	2010	2013	Change	2011	2013	Change	County*	Tourism 2013	% of Total Jobs
Wisconsin	$9,197.3	$10,845.58	15.20%	180,608	185,495	2.6%	4,292.2	$4,657.63	7.84%	$1,202.1	$1,349.53	10.93%	$23,765.54	$25,109.22	5.65%	2,752,732	**185,495**	6.74%
Barron County	$76.9	$87.76	12.38%	1,377	1,356	-1.5%	$26.6	$28.58	6.85%	$9.2	$10.04	8.35%	$19,343.01	$21,072.51	8.94%	28,781	**1,356**	4.71%
Buffalo County	$8.5	$10.38	18.23%	173	185	6.3%	$3.3	$3.56	6.91%	$1.1	$1.25	14.53%	$19,179.61	$19,297.48	0.61%	8,435	**185**	2.19%
Burnett County	$21.9	$21.45	-1.90%	422	368	-14.7%	$6.6	$6.31	-4.30%	$2.9	$2.85	-2.26%	$15,568.11	$17,116.64	9.95%	6,820	**368**	5.40%
Chippewa County	$66.2	$77.61	14.70%	1,296	1,326	2.3%	$26.2	$28.74	8.86%	$8.2	$8.88	7.86%	$20,217.79	$21,667.56	7.17%	31,660	**1,326**	4.19%
Clark County	$22.1	$26.39	16.36%	354	354	-0.1%	$6.1	$6.31	2.95%	$2.5	$2.80	10.98%	$17,296.99	$17,836.04	3.12%	16,905	**354**	2.09%
Columbia County	$88.3	$110.58	20.18%	1,585	1,725	8.1%	$29.8	$33.94	12.09%	$11.9	$13.43	11.45%	$18,821.38	$19,678.04	4.55%	29,006	**1,725**	5.95%
Crawford County	$33.0	$39.16	15.65%	681	714	4.6%	$11.7	$11.42	-2.34%	$4.9	$5.40	8.70%	$17,160.71	$16,004.42	-6.74%	10,460	**714**	6.82%
Dunn County	$36.5	$42.66	14.34%	809	836	3.2%	$14.9	$16.37	9.15%	$5.0	$5.62	10.92%	$18,382.81	$19,585.27	6.54%	21,245	**836**	3.93%
Eau Claire County	$166.8	$195.80	14.81%	3,879	3,963	2.1%	$81.2	$87.64	7.32%	$23.2	$25.50	8.95%	$20,938.39	$22,112.50	5.61%	70,107	**3,963**	5.65%
Green Lake County	$28.9	$34.74	16.84%	687	753	8.8%	$12.0	$14.41	16.61%	$4.6	$5.28	13.56%	$17,500.73	$19,130.02	9.31%	9,769	**753**	7.71%
Jackson County*	$30.7	$32.27	4.73%	556	532	-4.5%	$8.9	$8.78	-1.05%	$4.2	$4.18	-0.29%	$15,951.99	$16,496.62	3.41%	11,513	**532**	4.62%
Monroe County	$58.7	$75.36	22.13%	1,055	1,200	12.0%	$19.7	$24.09	18.07%	$8.1	$9.50	14.81%	$18,704.63	$20,082.22	7.36%	24,727	**1,200**	4.85%
Outagamie County	$260.1	$300.11	13.32%	6,217	6,255	0.6%	$137.3	$148.84	7.78%	$36.5	$39.69	8.14%	$22,080.56	$23,796.60	7.77%	124,258	**6,255**	5.03%
Pepin County	$4.5	$5.43	16.40%	97	100	3.4%	$1.7	$1.82	5.91%	$0.6	$0.66	11.45%	$17,755.83	$18,237.09	2.71%	3,266	**100**	3.06%
Pierce County	$21.8	$24.72	11.94%	406	409	0.6%	$7.6	$7.81	2.53%	$2.7	$2.94	7.65%	$18,730.88	$19,103.33	1.99%	14,369	**409**	2.85%
Polk County	$70.1	$76.42	8.22%	1,070	1,045	-2.4%	$19.7	$19.90	1.16%	$7.5	$8.22	8.77%	$18,380.44	$19,040.66	3.59%	20,122	**1,045**	5.19%
Portage County	$92.5	$104.31	11.31%	2,074	2,039	-1.7%	$40.5	$40.89	0.83%	$13.2	$14.06	6.26%	$19,551.21	$20,050.49	2.55%	43,167	**2,039**	4.72%
Trempealeau County	$20.8	$22.26	6.77%	389	365	-6.5%	$7.0	$7.25	3.51%	$2.5	$2.61	3.21%	$17,981.79	$19,853.45	10.41%	16,829	**365**	2.17%
Waupaca County	$71.2	$81.75	12.87%	1,274	1,268	-0.5%	$21.4	$23.17	7.57%	$9.2	$9.94	7.71%	$16,810.33	$18,271.77	8.69%	25,734	**1,268**	4.93%
Wood County	$75.2	$81.57	7.81%	2,158	2,080	-3.7%	$50.3	$53.15	5.33%	$10.2	$10.63	3.58%	$23,320.85	$25,548.08	9.55%	50,781	**2,080**	4.10%