CITY HALL
207 Lafayette Street
P.O. Box 378
Winona, MN 55987-0378
FAX: 507/457-8212

March 21, 2013

Planning Commissioners
Winona, Minnesota 55987

Dear Commissioner:

The next meeting of the Planning Commission will be held on **Monday, March 25, 2013, at 4:30 p.m. in the Council Chambers** of the Winona City Hall.

1. **Call to Order**
2. **Minutes – February 11, 2013**
3. **Transportation Impact Analyses for Silica Sand Facilities & Mines**
4. **Air Quality Monitoring for Silica Sand Operations**
5. **Other Business**
6. **Adjournment**

Sincerely,

Carlos Espinosa
Assistant City Planner

PLANNING COMMISSION MINUTES

DATE:	February 11, 2013
TIME:	4:30 p.m.
PRESENT:	Commissioners Hahn, English, Ballard, Gromek, Boettcher, and Porter
ABSENT:	Commissioners Buelow, Davis, and Olson
STAFF PRESENT:	City Planner, Mark Moeller

The meeting was called to order at 4:30 p.m. by Chairman Porter.

Approval of Minutes – January 28, 2013

The minutes from the Commission's meeting of January 28, 2013, were reviewed and upon motion by Commissioner Boettcher and second by Commissioner Ballard were unanimously approved as submitted, with the amendment that Carlos Espinosa was not present.

Public Hearing – Zoning of Annexed Properties – Pleasant Valley Terrace Subdivision #1 Area

Chairman Porter introduced this item and concluded by calling on Mr. Moeller, City Planner, to present a summary of the issue. Mr. Moeller noted that during its meeting of August 13th of last year, the Commission initiated the zoning process of 20 parcels which have been annexed into the City since enactment of the City/Wilson Township Orderly Annexation Agreement in 2005. Since newly annexed lands come into the City with an unzoned status, the purpose of the Commission's action was to consider R-1 Zoning for 18 of these parcels, R-S Zoning for 2 parcels and Agricultural Zoning for 1. Given that action, staff has broken the total down into 3 separate "applications". The first of these, related to the zoning of 8 parcels located within the Pinecrest neighborhood, was completed in November of 2012. The application before the Commission this afternoon pertains to the zoning of 10 parcels located within the Pleasant Valley Terrace Subdivision #1 and two parcels located southerly of the subdivision along County Road 17. As recommended in the attached staff analysis, lots within the Pleasant Valley Terrace #1 Subdivision are proposed to be zoned R-1 (One Family Residence). The 2 parcels located along County Road 17 are proposed to be zoned R-S (Residential Suburban). As reflected in the staff analysis, proposed classifications would lock in use which presently exists, while the purpose and intent of the City's 2007 Comprehensive Plan would be achieved. Here, it was noted that the Comprehensive Plan has slated the area for low density residential use. By definition, both districts meet this class of use.

Mr. Moeller noted that in conformance with public hearing protocol, this hearing had been preceded by media and property owner notice.

At this point, Chairman Porter opened the public hearing by calling for anyone who wished to speak to the issue to present first their name and address. There being no one in attendance to speak for or against the proposal, the public hearing was closed.

Following brief discussion, it was moved by Commissioner Gromek and seconded by Commissioner Boettcher to recommend approval of the proposal as outlined in the staff report, to Council. When the question was called, the vote of the Commission was unanimous to approve the motion.

Mr. Moeller noted that the next step in this process would be a Council hearing which is expected to occur within early March.

Public Hearing – Proposed Code Amendments – Bed & Breakfast/Tourist Homes
Chairman Porter introduced this item and called on Mr. Moeller to provide a summary of it.

Mr. Moeller noted that given discussion occurring during Commission meetings of January 14th & January 28th, the purpose of this hearing was to consider proposed amendments to City Code Sections 43.54.1, 43.55, 43.57, 43.58, and 43.65, pertaining to Bed and Breakfast/Tourist Homes within the City. He noted that in part, initial discussion of this item stemmed from a citizen request seeking to establish a tourist home on property located within an R-R (Rural Residential) Zoning District, and which presently does not permit such use.

Mr. Moeller noted that, although approval of the proposal would serve to modify a number of standards pertaining to the regulation of Bed and Breakfast/Tourist Homes within the City, the more significant of these changes would include:

1. The application of the Bed and Breakfast/Tourist Home use concept would be extended to low density (R-S & R-R) residential zoning districts as well as the agricultural zoning district. Uses are presently permitted within R-1, R-1.5, R-2, and R-3 zoning districts. Given this change, the permissible number of guest rooms within the R-S and R-R District would be 3 while a maximum of 5 would be permitted within an agricultural zone. The proposal would also serve to downscale the number of guest rooms within R-1 and R-1.5 districts from 4 to 3 (consistent with R-S and R-R Districts). Within Medium Density (R-2) Districts, the number would be reduced from an undefined maximum to 5. Although no maximum applies to Multiple Family (R-3) Districts the number of guest rooms could not exceed lot area divided by 1,500 square feet as found under Code Section 43.54.1 (Bed & Breakfast/Tourist Home Performance Standards).
2. Bed & Breakfast/Tourist Homes would be treated as "conditional uses" in all but the R-3 Zoning Districts. Given this, Board of Adjustment hearings and approvals would be required for any such use proposed within any Agricultural or Residential Zoning District but the R-3 District. Since Board of Adjustment hearings are preceded by notice to the immediate neighborhood, this process would provide maximum transparency to most use proposals.
3. Presently, Bed & Breakfast/Tourist Home uses are permitted only upon properties that have "demonstrated community historical significance". Since

this language is proposed to be removed from the ordinance, new uses would not be subject to any form of locational requirement. If the use meets performance standards of Section 43.54.1 and required Board of Adjustment approvals, it would be permitted at any location.

4. Currently, Bed & Breakfast/Tourist Homes need to provide two off street parking spaces for the host or host family. Additional spaces for guest rooms are not mandated. Amendments would require the provision of guest room off street parking spaces at a ratio of one space per guest room, in addition to the two spaces for the host family. This standard would be consistent with that required of hotels & motels.

At this point, Chairman Porter opened the public hearing and called for anyone who wished to speak to present first their name and address. There being no one present to speak for or against the proposal, the public hearing was a closed.

During subsequent deliberation, discussion ensued relative to the provision of cooking within guest units. It was noted that the definition could extend to something as simple as a microwave located within a guest room. Although no reference to cooking within guest rooms is made in the draft proposal, the consensus of those present was that cooking within guest rooms should be permitted if properly certified and licensed for that purpose.

Mr. Moeller noted that the concept of a Bed & Breakfast use is generally consistent with a rooming unit within an owner occupied home. Although formal kitchens are typically not a part of such uses, it was conceivable that rooms could incorporate microwaves for a limited cooking function. Absent that, the basis of a Bed & Breakfast facility is that a breakfast meal is served and other meals are typically found outside of the home.

Unlike the Bed & Breakfast concept, Mr. Moeller noted that a tourist home could consist of a modified apartment which is rented on short term basis to transient guests. Such units may include kitchens and may or may not include a breakfast with stays.

Following significant discussion of this item, Commissioner Ballard suggested that the ordinance be modified to allow no guest room cooking within Bed & Breakfast Homes and to allow cooking within guest rooms of Tourist Homes. This concept was subsequently submitted as a motion by Commissioner Ballard and seconded by Commissioner Boettcher. When the question was called, the vote of the Commission was unanimous.

Adjournment

There being no further business to come before the Commission, the meeting was adjourned.

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Mark Moeller
City Planner

PLANNING COMMISSION

AGENDA ITEM: 3. Transportation Impact Analyses for Silica Sand Facilities & Mines

PREPARED BY: Carlos Espinosa

DATE: March 25, 2013

Summary

During the review of transportation impact analyses and road use agreements, the City Council directed staff to draft code amendments to require that all frac sand facilities complete a Transportation Impact Analysis (TIA). Attached are draft code amendments that would enact this requirement. The amendments would also require any future mines (whether they excavate frac sand or not) to complete a TIA.

The draft amendments also include also refer to "frac" sand as "silica sand" and give the following definition:

> *Silica Sand: A naturally existing high quartz level sand for several industrial uses. Silica sand does not include common rock, stone, aggregate, gravel, or sand with a low quartz level.*

This is the same definition for "frac" sand that is in House File 1367 currently being discussed at the state legislature.

Next Steps

Council requested that the Planning Commission return amendments that would require all frac sand facilities to complete TIAs. As such, the proposed amendments should be discussed before holding a public hearing and forwarding the amendments to Council.

Attachments:

A) Draft Ordinance Amendments
B) Exisiting TIA Ordinance

AN ORDINANCE TO AMEND
THE CODE OF THE CITY OF
WINONA, MINNESOTA
1979

The City of Winona does ordain:

Section 1. That Section 43.01 of Chapter 43 of the City Code of Winona, Minnesota, 1979, which Section sets forth "Definitions" of the Zoning Chapter, be amended as follows:

43.01 DEFINITIONS. For the purposes of this chapter, the following words and phrases shall have the meanings respectively ascribed to them by this section:

Silica Sand: naturally existing high quartz level sand for several industrial uses. Silica sand does not include common rock, stone, aggregate, gravel, or sand with a low quartz level.

Section 2. That Section 43.63 (b)(39) of Article XIV of the City Code of Winona, Minnesota, 1979, which is entitled "M-2 General Manufacturing District" be amended as follows and re-lettered accordingly:

(39) Silica ~~S~~sand processing facilities, including silica sand washing and drying facilities. In addition to the general performance standards set forth in Section 43.33, silica sand processing facilities shall also comply with the following specific conditions:

(9) Transportation Impact Analysis. Notwithstanding the provisions of Section 43.89 (a), all silica sand facilities shall complete a Transportation Impact Analysis in accordance with Article IX "Transportation Impact Analyses and Road Use Agreements."

Section 3. That Section 43.63 (b)(40) of Article XIV of the City Code of Winona, Minnesota, 1979, which is entitled "M-2 General Manufacturing District" be amended as follows:

(40) Transportation facilities used to ship silica sand, except for dredged material (e.g. river sand) from the Mississippi River. In addition to the

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general performance standards set forth in Section 43.33, transportation facilities used to ship silica sand shall also comply with the specific conditions set forth under 43.63 (b) (39) above.

Section 4. That Article XII of the City Code of Winona, Minnesota, 1979, which Article addresses "Extraction Pits" be amended as follows:

43.48 EXTRACTION PITS.

(a) General Requirements. Unless otherwise provided, the Board of Adjustment shall grant a conditional use permit for all such uses in accordance with Section 22.21, Section 43.30, the underlying zoning district, and the following conditions:

(19) Transportation Impact Analysis. ~~Owner/applicant shall be responsible for the preparation of a traffic study in accordance with Article XVIII "Transportation Impact Analyses and Road Use Agreements" for operations generating 200 or more heavy commercial vehicle (over 33,000 lbs.) trips per day at maximum operating capacity. This threshold shall not prevent the City Engineer from requiring analyses for projects where heavy commercial vehicles from the operation would contribute more than 20% of the traffic on any road used to reach a truck route for which residential property makes up more than 50% of the street frontage.~~ Notwithstanding the provisions of Section 43.89 (a), all extraction operations/mines shall complete a Transportation Impact Analysis in accordance with Article IX "Transportation Impact Analyses and Road Use Agreements."

Section 5. That this ordinance shall take effect upon its publication.

Dated this _____ day of _____, 2013.

_____
Mayor

Attested By:

_____
City Clerk

ARTICLE IX. TRANSPORTATION IMPACT ANALYSES AND ROAD USE AGREEMENTS

43.88 PURPOSE.

(a) Purpose and Intent: The intent of this article is to provide the information necessary to allow decision-makers to assess the transportation implications of traffic associated with a proposed development in relation to safety, the existing and proposed capacity and condition of the street system, congestion, and the quality of life of neighboring residents. This article establishes requirements for the analysis and evaluation of transportation impacts associated with proposed developments. Traffic studies should identify what improvements, if any, are needed to:

(1) Ensure safe ingress to and egress from a site;
(2) Maintain adequate street capacity on public streets serving the development;
(3) Ensure safe and reasonable traffic operating conditions on streets and at intersections;
(4) Avoid creation of or mitigate existing hazardous traffic conditions;
(5) Minimize the impact of non-residential traffic on residential uses in the vicinity; and
(6) Protect the public investment in the existing street system.

43.89 GENERAL PROVISIONS

(a) When Required: A Transportation Impact Analysis and Road Use Agreement shall be required for any development subject to a site plan or CUP after 1/1/2013 which will generate 200 or more heavy commercial vehicle trips per day at maximum daily operating capacity. An analysis shall be required for projects where heavy commercial vehicles from the operation would contribute more than 20% of the traffic on any local street.

(b) Jurisdiction: The City Engineer shall have the final authority for determining the need and adequacy of Transportation Impact Analyses and Road Use Agreements. The City Engineer may waive the requirement for a Transportation Impact Analysis and/or Road Use Agreement.

(c) Applicability: A Transportation Impact Analysis shall apply to roads used for transporting materials in heavy commercial vehicles, extending from the site access to a truck route unless waived by the City Engineer.

(d) Application: No development application subject to a Transportation Impact Analysis or Road Use Agreement shall be considered complete unless accompanied by an appropriate traffic study except if a waiver has been granted.

(e) Findings: A Transportation Impact Analysis shall find the following:

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(1) The traffic generated by the proposed use can be safely accommodated on proposed haul routes and will not need to be upgraded or improved in order to handle the additional traffic generated by the use; or

(2) A Road Use Agreement is recommended specifying responsibility for improving and maintaining roads including remediation of damaged roads and specification of designated haul routes.

43.90 TRANSPORTATION IMPACT ANALYSES

(a) Contents: A Transportation Impact Analysis shall contain the following information at a minimum:

(1) An analysis of existing traffic on road segments and intersections from site access to a truck route.

(2) Traffic forecasts for road segments and intersections from site access to a truck route. Such forecasts shall be based on the maximum trips per day.

(3) An analysis of the impact of the proposed development on residential streets in the vicinity of the site to identify any potential adverse effects of the proposed development and mitigation measures to address any impacts. Examples of possible effects include, but are not limited to, non-residential traffic impacts on residential neighborhoods, schools, pedestrian and bicyclist safety hazards (especially at points where haul routes intersect with facilities having high levels of pedestrian or bicycle traffic), traffic noise, or turning movement conflicts with other driveways or local access roads.

(4) An analysis of level of service for intersections from site access to a truck route.

(5) An analysis of intersection sight distances.

(6) An analysis of the road's structural ability to handle trucks extending from site access to a truck route. Such analysis shall include an analysis of existing and projected cumulative equivalent single axle loads (ESALs) using the Minnesota Local Road Research Board (LRRB) Pavement Impacts of Large Traffic Generators methodology. A structural analysis shall also be completed for any bridge or culvert along a public road used for a haul or access route if identified as at risk for structural failure due to increased ESAL loadings from the proposed use.

(7) A finding that traffic impacts can either be handled by the roads studied or:

i. A list of infrastructure improvements needed to bring the route up to commonly accepted engineering design standards and access management criteria, and/or

ii. A list of roadbed, ride surface, or drainage improvements that are needed to increase the structural stability of roads and any substructure, superstructure or deck improvements needed to increase the structural stability of bridges and culverts.

43.91 ROAD USE AGREEMENTS

(a) A Road Use Agreement shall be prepared for developments subject to a Transportation Impact Analysis at the discretion of the City Engineer. Such agreement shall be developed in response to the findings of a Transportation Impact Analysis. The agreement may address, but is not limited to, any of the following road infrastructure matters:

(1) Responsibility for upgrading

a. Pavement sections, bridges, and culverts structural condition

b. Intersection signals and signage

c. Geometric design, including entrances, intersections, railroad and pedestrian/bicycle facility crossings, geometric design of bridges and culverts, and typical road cross-sections;

(2) Responsibility for exceptional maintenance attributable to the use, estimated based on Minnesota Local Road Research Board (LRRB) Pavement Impacts of Large Traffic Generators methodology;

(3) Responsibility for clean-up of spillage and public road dust control along haul routes;

(4) Establishment of financial accounts to address costs associated with upgrading and exceptional maintenance costs;

(5) Delineation of a haul route between site access and a truck route;

(6) Schedules of operation and hauling, including construction operations;

(7) Methods to verify and report type, number, and weight of truck loads;

(8) Emergency conditions creating a need for immediate road repairs or road closing;

(9) Required insurance; and

(10) Remedies and enforcement measures.

ORD. 3924 2/19/2013

PLANNING COMMISSION

AGENDA ITEM: 4. Air Quality Monitoring for Silica Sand Operations

PREPARED BY: Carlos Espinosa

DATE: March 25, 2013

Note: There is a significant amount of technical language in this agenda item. In general, $PM_{2.5}$ and PM_4 refer to *size* of individual particles in the ambient (outdoor) air, and 3ug/m^3 refers to the *amount* of particles in the ambient air. Staff will give a presentation at the meeting to help explain these terms and others.

Summary

During the frac sand moratorium over the past year, one of the issues studied by the Planning Commission was air quality. At its meeting on July 9, 2012, the Commission recommended that requirements for moisture testing be added to City Code to address concerns about ambient silica dust from frac sand. The idea behind the moisture testing recommendation was that if the sand is kept wet, dust will not be produced.

The City Council adopted the moisture testing requirement in February 2013 as part of the package of ordinance amendments approved at the end of the sand moratorium.

On March 4th, the City Council requested staff to further study air quality monitoring with the Planning Commission.

Considerations

When examining air quality monitoring, it's important to review results from monitoring that has occurred at existing silica sand operations. Perhaps the best data comes from three facilities in Wisconsin (one processing facility and two mines). At these operations, EOG Resources has hired Dr. John Richards to monitor crystalline silica in the ambient air at the PM_4 particle size level. Dr. Richards' methods for monitoring crystalline silica have been previously used to monitor for the California crystalline silica standard (3ug/m^3). Dr. Richards' methods for monitoring PM_4 are also being studied by the Minnesota Department of Health for recommendation to the MPCA (Minnesota Pollution Control Agency). It is likely that Dr. Richards' monitoring methods and the California standard of 3ug/m^3 will be recommended by the Minnesota Department of Health to the MPCA sometime in 2013. After that, it's the responsibility of the MPCA to determine how to implement the standard in Minnesota. As such, this Wisconsin study is particularly informative. Preliminary results show that the three sites examined are not producing ambient crystalline silica dust at levels that are potentially hazardous to the public (see Attachment A).

Another example comes from monitoring that was completed in January of this year. The monitoring took place adjacent to the City of Winona's Central Garage at 1104 W. 3rd Street. The monitoring was meant to provide a snapshot of background air quality in Winona. It was conducted by students from the University of Wisconsin Eau Claire under the supervision of Dr. Crispin Pierce – a professor of public health at the same university. The results show that when the samples were taken (for one hour on January 14th), the air quality at the Central Garage was below federal standards for $PM_{2.5}$ in a 24 hour period, but above federal $PM_{2.5}$ standards for an annual period (see Attachment B). As stated in the results letter from Dr. Pierce, "Our measurements should be interpreted cautiously, as they provide a "snapshot" of air quality that is affected by wind, precipitation and activities in the area. An improved assessment of air quality would entail longer-term $PM_{2.5}$ measurements of $PM_{2.5}$ concentrations."

In addition to results from air quality monitoring, it's also important to consider that the state is currently studying statewide standards for crystalline silica. Bills addressing silica sand are currently working their way through the state legislature. The bills differ in approach, but all include provisions for technical assistance to local governments from state agencies such as the MPCA. At the same time (as mentioned above), state agencies themselves are studying how to address silica sand issues (such as air quality). This is important because, as stated at previous Planning Commission meetings, the resources and expertise for air quality monitoring lie with air quality consultants and the MPCA. As such, it may be prudent to wait for the state to implement appropriate air quality regulations – especially given recent monitoring results from Wisconsin.

Potential Code Amendments

One option discussed at Council was requiring all frac sand facilities conduct air quality monitoring. To do this, an amendment to the City's performance standards for dust would have to be made. Draft language for the amendment is underlined below:

(e) *Performance Standards, Regulations. The following provisions, standards and specifications shall apply:*

(7) *Fly ash, dust, fumes, vapors, gases, and other forms of air pollution…Moisture testing of sand or other materials with the potential to produce Particulate Matter emissions may be required to ensure that moisture levels are above 2.5%. A substitute for moisture testing is air quality monitoring completed in correspondence with the MPCA. ~~and according to applicable state regulations.~~ Provided however, that all facilities handling uncovered or unenclosed silica sand shall employ a qualified professional to conduct PM4 ambient air quality monitoring for crystalline silica for a minimum of one year. Monitoring shall occur at the fence line of a facility. The monitoring design shall have a means for determining baseline air quality, and results of such monitoring shall be*

made publicly available on a real-time basis. Such monitoring shall use 3 ug/m^3 as a chronic reference exposure limit for ambient crystalline silica.

As written, monitoring would only be required at facilities with uncovered or unenclosed sand. Facilities that entirely enclose sand would not be required to conduct monitoring. Monitoring would be the financial responsibility of the operator. The operator would employ an air quality consultant to conduct monitoring for a minimum of one year. The MPCA would provide technical assistance by reviewing the monitoring plans and helping to interpret monitoring results. If the results of monitoring show a facility to be in potential violation of the limit for ambient crystalline silica, the operator would be required to make changes to minimize dust creation and monitoring could be required for another year to demonstrate compliance.

Next Steps

Council requested that the Planning Commission study air quality monitoring and return a recommendation to the Council. After discussion, a few options available to the Commission are the following:

1) Recommend language requiring air quality monitoring be formalized for inclusion in City Code.
2) Refer the subject to the Citizens Environmental Quality Commission for further study before bringing it back to the Commission.
3) Recommend that further action on air quality monitoring be deferred until the state has implemented appropriate air quality regulations.

Attachments:

A) Preliminary Air Quality Monitoring Results from Wisconsin
B) Air Quality Monitoring Results from Winona

EOG Resources, Inc.
Ambient PM4 Crystalline Silica

John Richards, Ph.D., P.E.
Air Control Techniques, P.C

November 5, 2012

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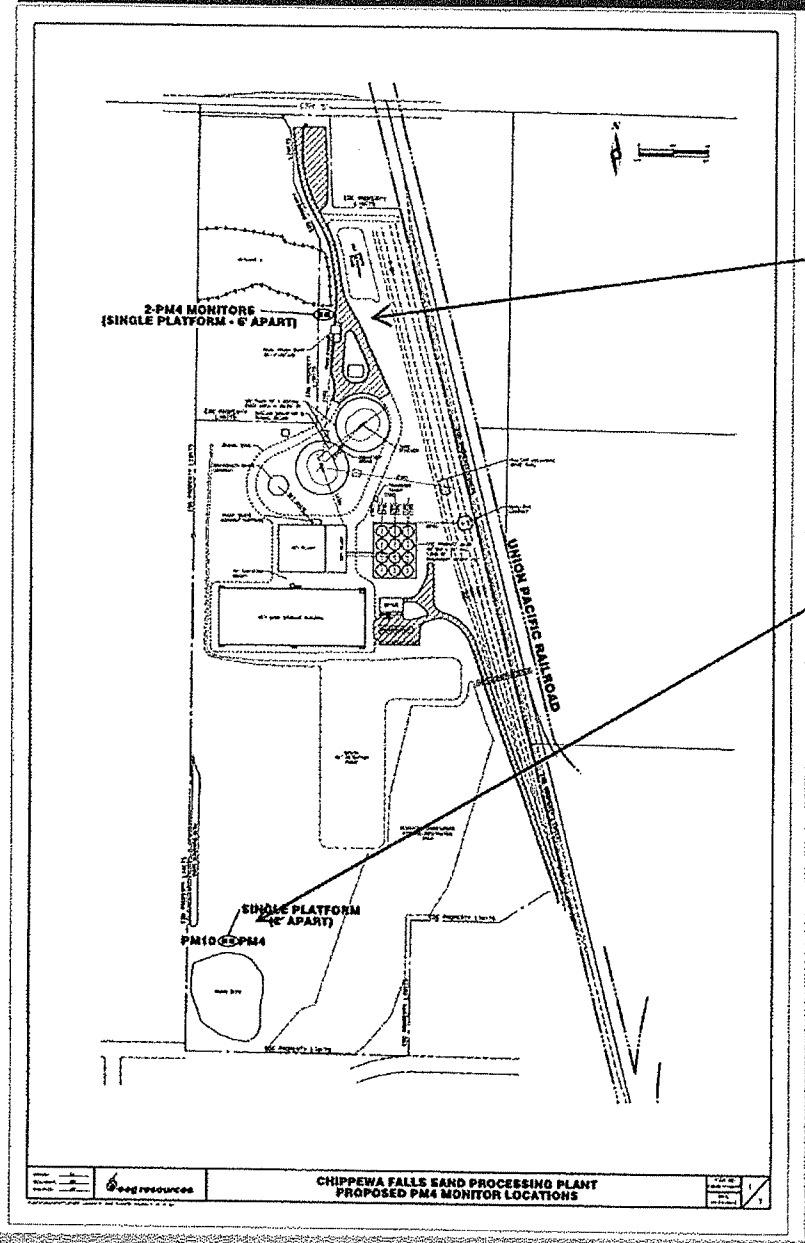
- One ambient PM4 crystalline silica sampler is located in position 1.
- Two ambient PM4 crystalline silica samplers are located in position 2.
- When winds move from position 1 to position 2 across the plant, the data from the set of samplers measure the impact of the plant being studied.
- When winds are not in the normal upwind to downwind direction, the data from samplers in both positions measure the background concentrations due to a combination of other sources.

Upwind-Downwind Sampling

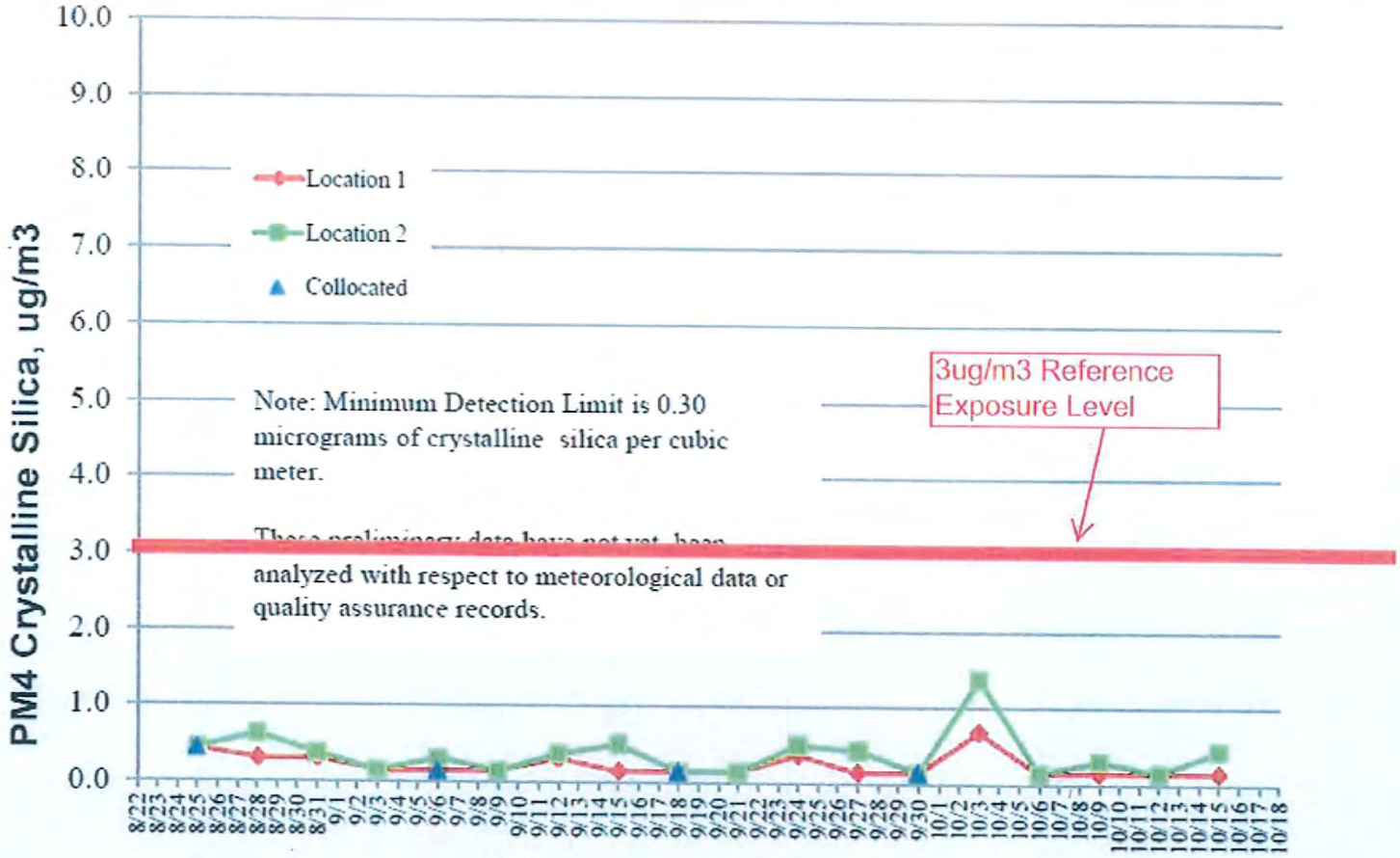


Chippewa Falls Plant

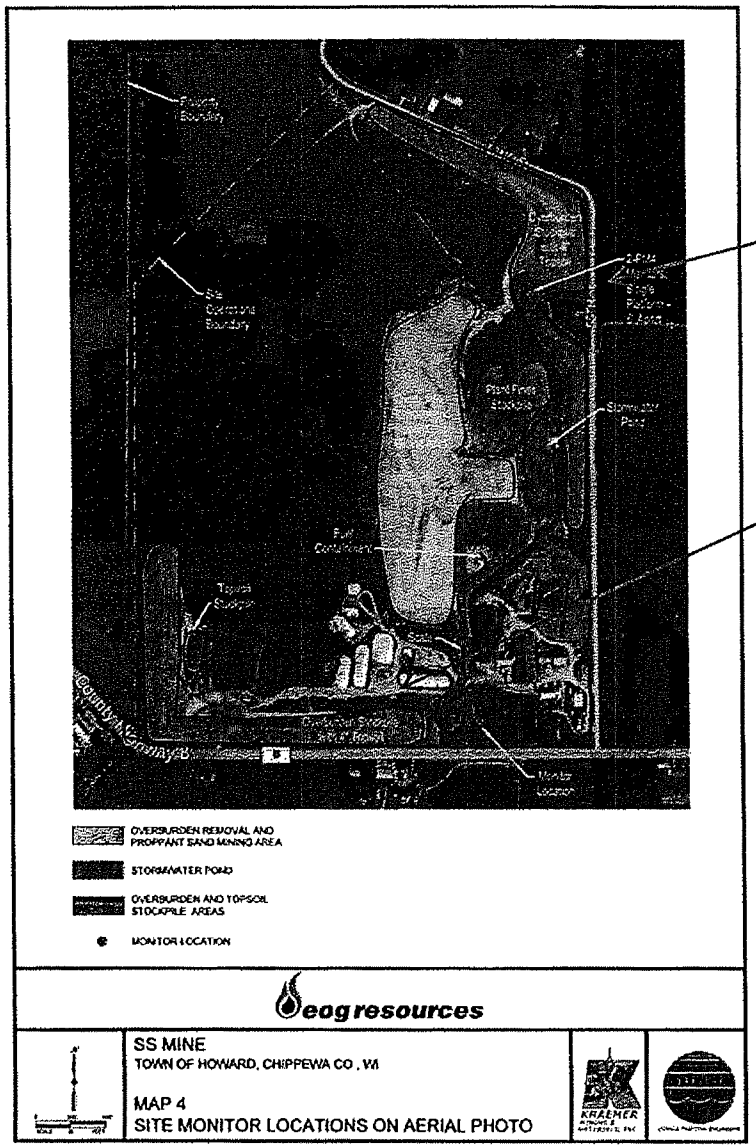
Downwind location is near the northern boundary of the facility.

Upwind location is identical to the existing PM10 sampler location at the southwest corner of the facility property.

Winds are from the south to the north approximately 25% of the year.



Chippewa Falls Preliminary Data

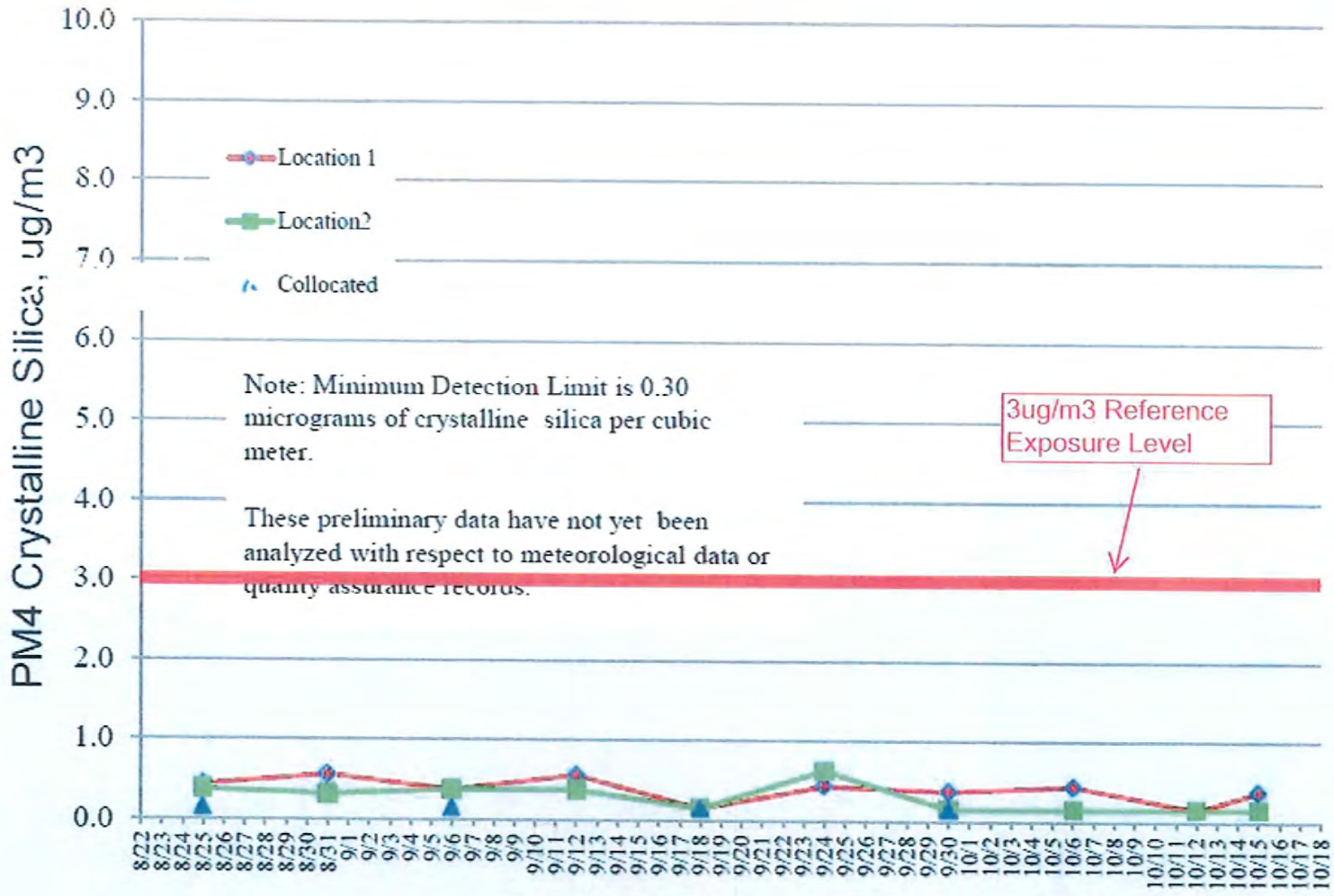


SS Mine
Town of Howard

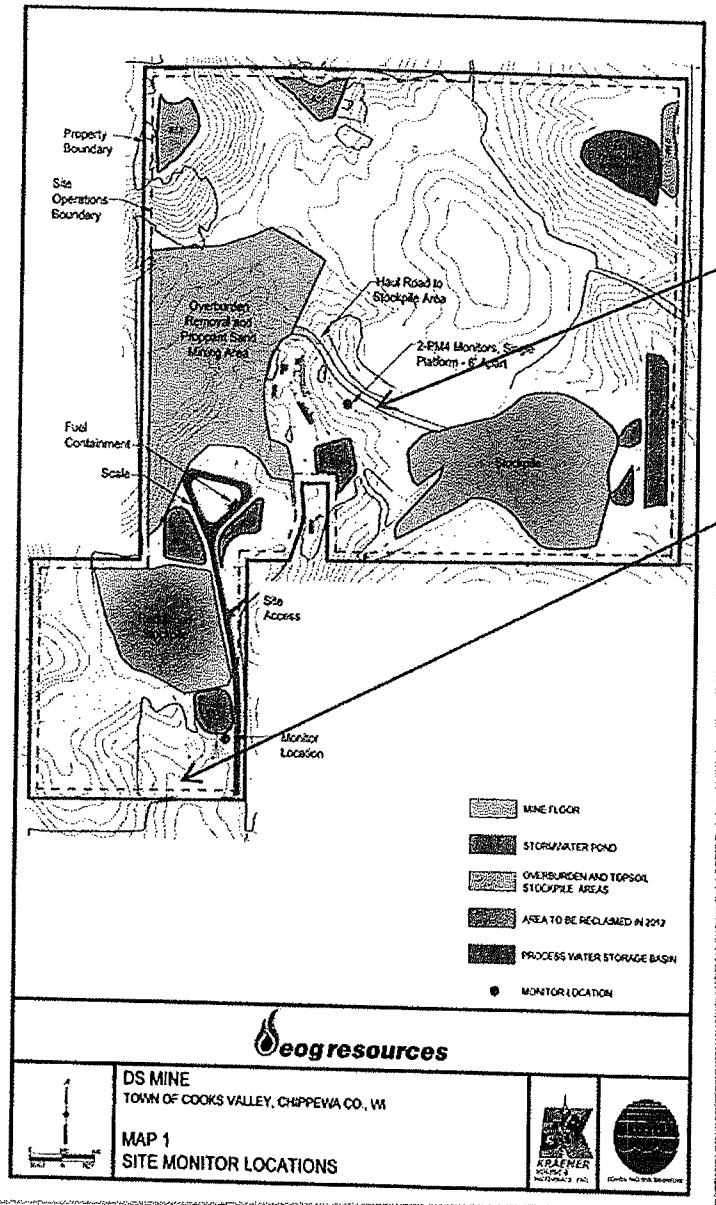
Downwind sampler location is on the northeast side of the facility property.

Upwind sampler location is in the south-center area near the plant office.

Winds are from the west, southwest, or south 50% of the time.



SS Mine Preliminary Data

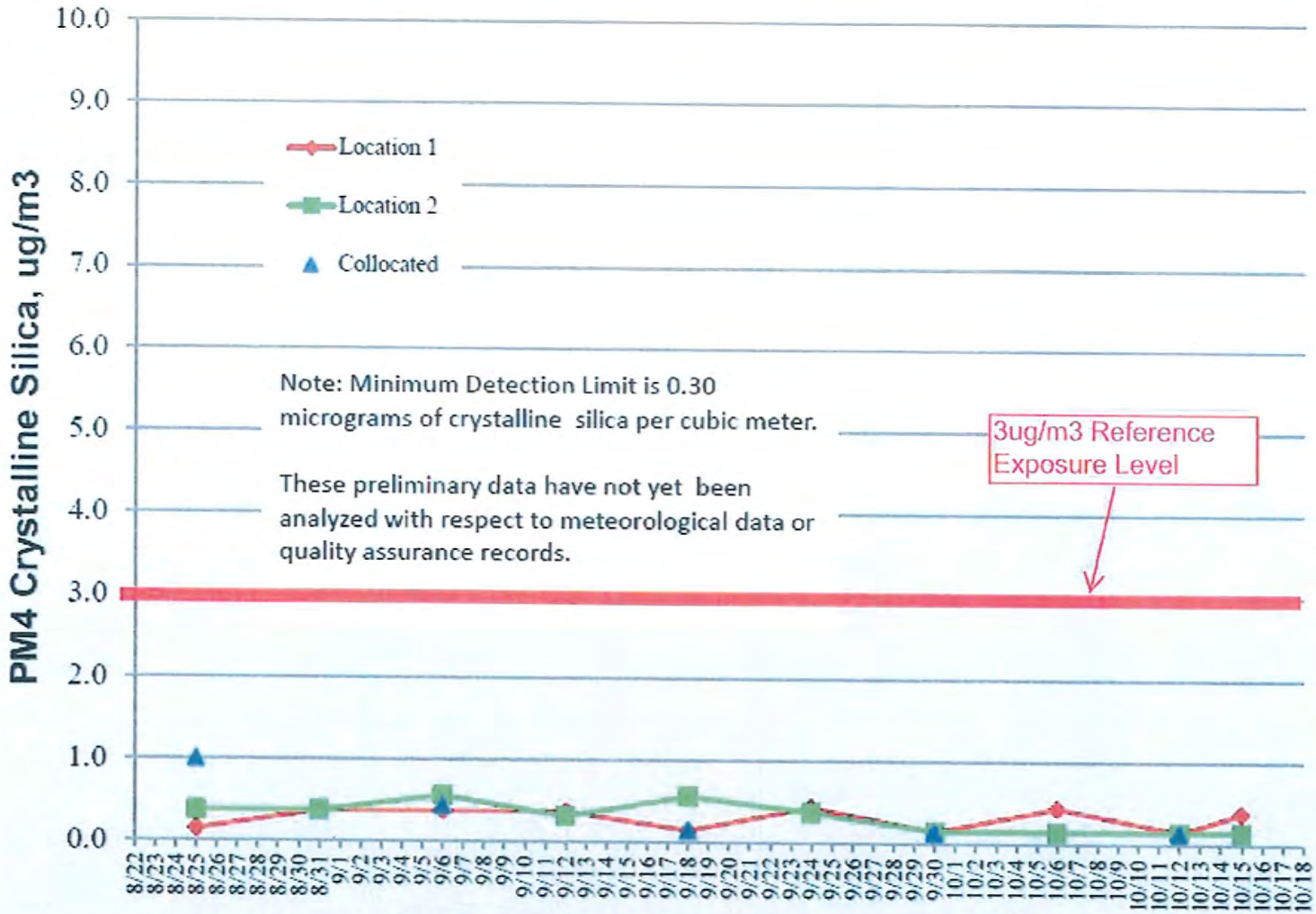


DS Mine
Cooks Valley

Downwind location is east of the active quarrying and processing areas.

Upwind location is in a grassy field on the south side of the facility property.

Winds are from the west, southwest, or south approximately 50% of the time.



DS Mine Preliminary Data

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

Jill Johnson, R.S./R.E.H.S.
Environmental Services Director
Project Management
Winona County – Administration
225 West 2nd Street
Winona, MN 55987
(507) 457-6405
jjohnson@co.winona.mn.us

1 March 2013

Dear Ms. Johnson:

Thank you for the opportunity to conduct air particulate sampling in the City of Winona as part of our faculty-student research at the University of Wisconsin-Eau Claire.

On January 14, 2013 students Jeron Jacobson, Zach Kroening, and Kim Shermo used our TSI DustTrak 8520 aerosol monitor to assess air quality in two locations in Winona: 1) County Highway 6 just east of County Highway 123; and 2) The Winona City Garage yard. At each location, we collected samples of 1-2 min in duration to measure PM_{10}, also known as "coarse particulates" of diameter 10 micrometers and smaller, and $PM_{2.5}$, also known as "fine particulates" of diameter 2.5 micrometers and smaller. The $PM_{2.5}$ particle size range is most clearly associated with health effects including cardiovascular disease, lung disease and lung cancer.

Here are the results of our sampling:

Site #1 Results:

PM 2.5:

- Average minimum: 13 micrograms/m3
- Average maximum (without truck interference): 22 micrograms/m3
- Average maximum (with truck interference): 40 micrograms/m3
- **Site average (with truck interference): 19 micrograms/m3**

PM 10:

- Average minimum: 14 micrograms/m3
- Average maximum: 23 micrograms/m3
- **Site average: 17 micrograms/m3**

The wind direction was mostly westerly (3 samples were south-westerly) at an average of 1.8 m/s. The collection times were between 10:54 am-12:04 pm. Our sample durations ranged from 56 seconds to 2 minutes and 19 seconds. We collected a total of 8 samples for each particle size in locations approximately 30 feet apart.

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Site #2 Results:
PM 2.5:
- Average minimum: 17 micrograms/m3
- Average maximum: 20 micrograms/m3
- **Site average: 19 micrograms/m3**

PM 10:
- Average minimum: 19 micrograms/m3
- Average maximum: 28 micrograms/m3
- **Site average: 23 micrograms/m3**

The wind direction was westerly at an average speed of 1.24 m/s. The collection times were between 2:00 pm-3:15 pm. Our sample durations ranged from 42 seconds to 2 minutes and 25 seconds. We collected a total of 8 samples for each particle size in locations approximately 30 feet apart.

Interpretation of local air particulate concentrations should be considered in the context of regional conditions measured by state agencies. On January 14, 2013, the Wisconsin Department of Natural Resources measured $PM_{2.5}$ at 38 micrograms/m3 in Eau Claire County and 29 micrograms/m3 in LaCrosse County between 11–noon (during sampling at Site #1) and at 42 micrograms/m3 and 30 micrograms/m3 between 2–3 pm (during sampling at Site #2, http://dnrmaps.wi.gov/imf/imf.jsp?site=wisards). Using the values from LaCrosse County (closer to Winona), the measured $PM_{2.5}$ concentrations in Winona were 10–11 micrograms/m3 lower than those measured by the WDNR in LaCrosse County.

The national US EPA standards for $PM_{2.5}$ concentrations are 35 micrograms/m3 over a 24-hour period and 12 micrograms/m3 over an annual period.

Our measurements should be interpreted cautiously, as they provide a "snapshot" of air quality that is affected by wind, precipitation and activities in the area. An improved assessment of air quality would entail longer-term measurements of $PM_{2.5}$ concentrations. We recommend requiring long-term $PM_{2.5}$ monitoring of sand mining, transportation and processing facilities and comparison to EPA standards to protect public health.

Sincerely,

Public Health Professions • Nursing, Room 277
Environmental Public Health
(715) 836-2628 • fax: (715) 836-5925 • www.uwec.edu/ph/