



**CITY HALL**

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February 10, 2012

Planning Commissioners  
Winona, Minnesota 55987

Dear Commissioner:

The next meeting of the Planning Commission will be held on **Monday, February 13, 2012, at 4:30 p.m. in the Wenonah Room** of the Winona City Hall.

1. Call to Order
2. Minutes – January 23, 2012
3. Public Hearing – Sand Processing and Transportation Facilities CUP Agreement
4. Public Hearing – Amendments to Sensitive Land Development/Other Code Sections
5. Other Business
6. Adjournment

Sincerely,

A handwritten signature in black ink, appearing to read "Mark Moeller".

Mark Moeller  
City Planner

# PLANNING COMMISSION

**AGENDA ITEM: 3. Public Hearing - Sand Processing and Transportation Facilities  
CUP Amendment**

**PREPARED BY: Carlos Espinosa**

**DATE: February 13, 2012**

## Background

The topic of frac sand operations in southeastern Minnesota has recently become very prominent. Much of the discussion in the Winona area has focused on mining proposals in Winona County. However, as the Planning Commission is aware, there are several frac sand operations currently functioning in the City. Staff has presented to the City Council on the topic and also provided a report to Council on how the operations have been handled up to this point. The report given to Council is attached to this agenda item (Attachment F).

The "Next Steps" section of the report references that one option "is for Council to draft specific language pertaining to sand washing and processing for inclusion in the M-2 zoning district." The report also states that sand processing and transportation could be regulated as a permitted use in the M-2 General Manufacturing district subject to specific provisions. However, a Conditional Use Permit (CUP) is a more appropriate tool to use with these land uses for four main reasons:

- 1) The expanding scope of sand operations in the region
- 2) The potential off-site impacts of operations in the City (e.g. noise from truck traffic, dust, etc.)
- 3) The ability to address specific concerns before a project is approved
- 4) The ability to include additional conditions in accordance with City Code to promote the City's health, safety, and general welfare

The attached draft ordinance (Attachment A) outlines proposed code amendments that would make sand processing and transportation facilities subject to a CUP in M-2 zoning districts. The sections of the ordinance are described in the next section. The M-2 zone would be the only zoning district where new sand operations are permitted as primary uses (they may be accessory uses to a mining operation in the A-G Agricultural district with a CUP). Staff's intent with the proposed amendments is to better address specific concerns about frac sand processing and transportation operations before a project begins rather than retroactively.

If the CUP approach is approved by Council, existing frac sand operations could continue (without a CUP), but would become nonconforming uses. As a result, any expansion of operations would require a Conditional Use Permit. The definition of expansion includes:

- 1) Addition of new equipment
- 2) Increase in land area of use
- 3) Expansion onto a new site

### Ordinance Description

Currently, there are 38 listed conditional uses in the M-2 zoning district (Attachment B). A CUP review by the Board of Adjustment is required for each. The process for M-2 district CUP review is outlined in Section 43.30 of the City Code (Attachment C). The process examines proposed conditional uses in accordance with the performance standards listed in Section 43.33 (Attachment D). Basically, if a proposed use meets the performance standards, a CUP can be granted. If the proposed use may cause emission of "dangerous or objectionable" elements, a report by a specialist may be required from the applicant.

#### **General Conditions**

The proposed amendments require the following uses to obtain a CUP in an M-2 zoning district:

- 39) *Sand processing facilities, including sand washing and drying facilities.*
- 40) *Transportation facilities used to ship sand, except for dredged material (e.g. river sand) from the Mississippi River.*

These uses would be reviewed in accordance with the following performance standards listed in City Code Section 43.33 (see Attachment D for more detail):

- 1) Fire and explosion hazard
- 2) Radioactivity or electric disturbance
- 3) Noise (*In accordance with and measured at locations stated in Chapter 39 (see Attachment E)*)
- 4) Vibration
- 5) Smoke
- 6) Odors
- 7) Fly Ash, dust fumes, vapors, gases, and other forms of air pollution
- 8) Glare
- 9) Liquid or solid waste
- 10) *Additional requirements – The City of Winona reserves the right to impose additional conditions to, within and upon issuance of a Conditional Use Permit as it deems necessary or appropriate to protect the health, safety, morals, and general welfare of the public.*

It's important to note that the amendments add number 10) above to the performance standards – it does not currently exist. Also, the proposed amendments add the following sentence to existing wording in number 7) above: *All activities shall comply with applicable state law, rules and local ordinances for Particulate Matter generation, and any stockpiles (including sand and dirt) which produce windblown dust shall be covered.*

### **Specific CUP Conditions**

In addition to compliance with the general conditions, sand processing and transportation facilities would be required to comply with the following specific conditions. If an applicant cannot fully comply with a condition, a variance may be requested:

- 1) Hard Surfacing – *Asphalt or concrete surfacing shall be required in any truck or equipment maneuvering area.*

This condition is included because the amount of on-site truck traffic has the potential to create dust that travels to adjacent properties. This issue has been observed at some existing frac sand operations.

- 2) Truck Route Designation – *All trucks entering and leaving such facilities shall enter and exit Winona on designated truck routes. Such routes shall avoid residentially zoned property to the greatest extent possible.*

This condition is included so that trucks avoid residential areas and for the City of Winona to have designated routes on record.

- 3) Stockpile Covering – *Stockpiles undisturbed for more than one week shall be covered.*

This condition is included to help prevent the potential for windblown dust from undisturbed stockpiles.

- 4) Stockpile Watering – *Uncovered stockpiles shall be watered regularly to prevent surface areas from drying out and becoming susceptible to wind erosion.*

This condition is included to help prevent the potential for windblown dust from uncovered stockpiles and the potential for particulate matter generation (see report to Council for a discussion on particulate matter).

- 5) Hours of Operation – *Hours of operation shall be limited to 7 a.m. – 10 p.m.*

This condition is included to limit the impact of sand operations on residential areas. The hours are based on decibel limits for "day" and "night" in residential zones according to the noise ordinance (see below or Attachment E). Staff's intent with this condition is to eliminate the potential for noise issues from truck traffic and

vehicles/machinery (especially those with back-up alarms) after 10 p.m. As such, the Commission may want to discuss allowing equipment (e.g. dryers, screeners, etc.) and machinery without back up alarms to operate after 10 p.m. provided noise ordinance requirements are met.

- 6) Landscaping and Screening – Sufficient landscaping and screening, as approved by the City of Winona, shall be provided to mitigate visual impacts of operations on adjacent properties.

This condition is included to help improve the aesthetics of projects as appropriate.

- 7) Contact Information – Facility operators shall provide current contact information to the City of Winona to facilitate prompt response to concerns.
- 8) Permits and Reports on File – Any applicable state or federal permits shall be placed on file at the City of Winona. Any reports generated to fulfill permit requirements shall be submitted to the City of Winona.

Conditions 7) and 8) are included to facilitate prompt response to complaints or concerns.

**Noise Pollution Ordinance (Chapter 39):**

Additional zones - The A-G, RMHP, R-S, R-R, and R-1.5 zoning districts shall be added to the noise ordinance.

These zones have been unintentionally left out of the noise ordinance. The proposed amendments add these zones as follows:

Zoning District	Day (7 a.m. - 10 p.m.)		Night (10 p.m. - 7 a.m.)	
	L <sub>50</sub>	L <sub>10</sub>	L <sub>50</sub>	L <sub>10</sub>
RMHP, R-S, R-R, R-1.5	60	65	50	55
R-1, R-2, R-3, C-1	60	65	50	55
B-1, B-2, B-3	65	70	65	70
B-2.5, M-1, M-2, <u>A-G</u>	75	80	75	80

**Performance Standards:**

1. Dust – All activities shall comply with applicable state law, rules and local ordinances for Particulate Matter generation and any stockpiles (including sand and dirt) which produce windblown dust shall be covered.
2. Noise – In accordance with and measured at locations stated in Chapter 39.

These proposed amendments address potential air quality and noise issues associated with frac sand operations.

### Next Steps

Staff requests the Planning Commission review the proposed amendments as part of a public hearing. At the end of discussion, a formal recommendation may be made. Staff will bring such recommendation to the City Council as part of a public hearing.

#### Attachments:

- A) Draft Ordinance
- B) M-2 Zoning District
- C) Performance Standards Review Procedure
- D) Performance Standards
- E) Noise Ordinance
- F) Staff Frac Sand Report to Council – not that the document does not contain the air quality report. The full report (21 pages) is posted on the City's website: [www.cityofwinona-mn.com](http://www.cityofwinona-mn.com) under "Blasting and Frac Sand Information" in the News and Announcements section.

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

The City of Winona does ordain:

Section 1. That paragraph (b) of Section 43.63 of the City Code of Winona, Minnesota, 1979, which paragraph sets forth Conditional Uses in an M-2 Zoning District, be amended as follows:

"43.63 (b) Conditional Uses. The following manufacturing uses shall be permitted in the M-2 district only if specifically authorized by the board in accordance with the provisions of Section 43.30; provided, that such uses can control the generation of any dangerous or offensive elements in their operation, so as to comply with the performance standards in Section 43.33 and subject to review in accordance with the performance standards procedure in Section 43.30 in all instances.

- (1) Acetylene manufacturing in excess of 15 pounds pressure per square inch.
- (2) Acid manufacture, except as provided in this section.
- (3) Asbestos manufacture.
- (4) Automobile assembly.
- (5) Bleaching, cleaning and dyeing plant.
- (6) Boiler shops, structural steel fabricating shops, railway car or locomotive shops, including repair metal working shops employing reciprocating hammers or presses over 20 tons rated capacity.
- (7) Distilling of liquors.
- (8) Brick, pottery, tile and terra cotta manufacturing.
- (9) Bulk station.
- (10) Candle or sperm oil manufacturing.
- (11) Cooperage works.
- (12) Dextrine, starch or glucose manufacturing.
- (13) Disinfectant, insecticide or poison manufacturing.
- (14) Enameling, lacquering or Japanizing, varnishing.
- (15) Emery cloth or sandpaper manufacturing.
- (16) Felt manufacturing.
- (17) Flour or grain mill.
- (18) Forge or foundry works.
- (19) Grain drying or poultry feed manufacturing, from refuse, mash or grain.
- (20) Hair or hair products manufacturing.
- (21) Lime or lime products manufacturing.
- (22) Linoleum, oil cloth or oiled goods manufacturing.
- (23) Match manufacturing.
- (24) Meat packing, stockyards or slaughterhouses must comply with the requirements of distance from other districts, as set out in this section.
- (25) Paper and pulp manufacturing.
- (26) Perfume manufacturing.

- (27) Pickle, sauerkraut or sausage manufacturing.
- (28) Plaster manufacturing.
- (29) Poultry slaughterhouse, including packing and storage for wholesale.
- (30) Printing ink manufacturing.
- (31) Radium extraction.
- (32) Sandblasting or cutting.
- (33) Sawmill, the manufacture of excelsior, wood fiber sawdust products.
- (34) Sewage disposal plant.
- (35) Shoddy manufacturing.
- (36) Shoe blacking or polish or stove polish manufacturing.
- (37) Steam power plant, except where accessory to a permitted principal use.
- (38) Slag piles.
- (39) Sand processing facilities, including sand washing and drying facilities. In addition to the general performance standards set forth in Section 43.33, sand processing facilities shall also comply with the following specific conditions:
  - a. Hard Surfacing. Asphalt or concrete surfacing shall be required in any truck or equipment maneuvering area.
  - b. Truck Route Designation. All trucks entering and leaving such facilities shall enter and exit Winona on designated truck routes. Such routes shall avoid residentially zoned property to the greatest extent possible.
  - c. Stockpile Covering. Stockpiles undisturbed for more than one week shall be covered.
  - d. Stockpile Watering. Uncovered stockpiles shall be watered regularly to prevent surface areas from drying out and becoming susceptible to wind erosion.
  - e. Hours of Operation. Hours of operation shall be limited to 7 a.m. – 10 p.m.
  - f. Landscaping and Screening. Sufficient landscaping and screening, as approved by the City of Winona, shall be provided to mitigate visual impacts of operation on adjacent properties.
  - g. Contact Information. Facility operators shall provide current contact information to the City of Winona to facilitate response to concerns.
  - h. Permits and Reports on File. Any applicable state or federal permits shall be placed on file with the City of Winona. Any reports generated to fulfill permit requirements shall be submitted to the City of Winona.
- (40) Transportation facilities used to ship sand, except for dredged material (e.g. river sand) from the Mississippi River. In addition to the general performance standards set forth in Section 43.33, transportation facilities used to ship sand shall also comply with the specific conditions set forth under 43.63 (b) (39) above.

The provisions of this section shall also apply to any other use which, in the opinion of the zoning inspector or board, is of a similar character with respect to the emission of dangerous or offensive elements to the uses listed above."

Section 2. That Section 39.03 of said Code, which section is entitled "Source Requirements" and pertains to Noise Pollution, be amended as follows:

"39.03 SOURCE REQUIREMENTS. (a) The source sound level requirements of this section shall apply at the property or zoning lines of the sound receiving unit. Measurements may be made at any location in zoning districts for evaluation purposes and to aid in the enforcement of other sections of this chapter.

(b) The source sound levels as stated below in subsection (c) shall be the highest source levels permitted in each zoning district.

(c) Source requirements: Ord. No. 3788 4/6/09

Zoning District	Day (7 a.m. - 10 p.m.)		Night (10 p.m. - 7 a.m.)	
	L <sub>50</sub>	L <sub>10</sub>	L <sub>50</sub>	L <sub>10</sub>
RMHP, R-S, R-R, R-1.5	60	65	50	55
R-1, R-2, R-3, C-1	60	65	50	55
B-1, B-2, B-3	65	70	65	70
B-2.5, M-1, M-2, A-G	75	80	75	80

(d) Sound levels resulting from travel of motor vehicles on state and county highways are exempt from these noise source requirements but not other sections of this chapter relating to motor vehicles operated in other areas. It is the intent of the city to reduce highway noise in the various land areas surrounding highways to or below the source requirements of this section when and wherever possible.

(e) All sound levels originating in any development or property which contains one or more buildings and which is without property lines for each building shall not exceed the source requirements for the applicable zoning district measured at the area of human activity, or if this is ill-defined, at any point on a line, all of whose points are equidistant from any two buildings."

Section 3. That paragraph (e) of Section 43.33 of said Code, which section sets forth Performance Standards for land and building use in the City, be amended as follows:

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

- (1) Fire and explosion hazard. All activities involving and all storage of inflammable and explosive materials shall be provided at any point with adequate safety devices against the hazard of fire and explosion and adequate firefighting and fire

suppression equipment and devices standards in the industry. Burning of waste materials in open fire shall be prohibited at any point. The relevant provisions of state and local laws and regulations shall also apply.

- (2) Radioactivity or electric disturbance. No activities shall be permitted which emit dangerous radioactivity at any point or electrical disturbance adversely affecting the operation at any point of any equipment other than that of the creator of such disturbance.
- (3) Noise. In accordance with and measured at locations stated in Chapter 39.
- (4) Vibration. No vibration shall be permitted which is discernible without instruments at the points of measurement specified in subsection (d) above.
- (5) Smoke. No emission shall be permitted at any point, from any chimney or otherwise, of visible gray smoke of a shade equal to or darker than No. 2 of the Power's Micro-Ringlemann Chart, published by McGraw-Hill Publishing Company, Inc., and copyright 1954 (being a direct facsimile reduction of the standard Ringlemann Chart as issued by the United States Bureau of Mines), except that visible gray smoke of a shade equal to No. 2 on said Chart may be emitted for 4 minutes in any 30 minutes. These provisions applicable to visible gray smoke shall also apply to visible smoke of different color but with an apparently equivalent capacity.
- (6) Odors. No emission shall be permitted of odorous gases or other odorous matter in such quantities as to be offensive at the points of measurement specified in subsection (d) above. Any process which may involve the creation or emission of any odors shall be provided with a secondary safeguard system, so that control will be maintained if the primary safeguard system should fail. There is hereby established as a guide in determining such quantities of offensive odors Table III, "Odor Thresholds," in Chapter 5 "Air Pollution Abatement Manual," copyright 1951 by Manufacturing Chemists' Assn., Inc., Washington, D.C.
- (7) Fly ash, dust, fumes, vapors, gases, and other forms of air pollution. No emission shall be permitted which can cause any damage to health, to animals, vegetation or other forms of property, or which can cause any excessive soiling, at any point;

and in no event any emission, from any chimney or otherwise, of any solid or liquid particles in concentrations exceeding 3/10 grains per cubic foot of the conveying gas at any point. For measurement of the amount of particles in gases resulting from combustion, standard corrections shall be applied to a stack temperature of 500 degrees Fahrenheit and 50 percent excess air. All activities shall comply with applicable state law, rules and local ordinances for Particulate Matter generation, and any stockpiles (including sand and dirt) which produce windblown dust shall be covered.

- (8) Glare. No direct or sky-reflected glare, whether from floodlights or from high-temperature processes, such as combustion, welding or otherwise, so as to be visible at the points of measurement specified in subsection (d) above. This restriction shall not apply to signs otherwise permitted by the provisions of this chapter.
- (9) Liquid or solid wastes. No discharge at any point into any public sewer, private sewage disposal system or stream or into the ground, except in accord with standards approved by the department of health of the state or standards equivalent to those approved by such department for similar uses of any materials of such nature or temperature as can contaminate any water supply or otherwise cause the emission of dangerous or offensive elements.
- (10) Additional Requirements. The City of Winona reserves the right to impose additional conditions to, within and upon the issuance of a Conditional Use Permit as it deems necessary or appropriate to protect the health, safety, morals and general welfare of the public."

Section 4. That this ordinance shall take effect upon its publication.

Dated this \_\_\_\_\_ day of \_\_\_\_\_, 2012.

\_\_\_\_\_  
Mayor

Attested By:

\_\_\_\_\_  
City Clerk

43.63 M-2 GENERAL MANUFACTURING DISTRICT. (a) Permitted Uses. Any use permitted and as regulated in the M-1 district shall be permitted in the M-2 district, except as hereinafter modified.

Any manufacturing use which is not prohibited altogether by this division or is not listed in subsection (d) of this section as subject to review in conformance with the performance standards procedure set forth in Section 43.30 may be permitted without such review; provided, however, that any such permitted use shall be subject to the requirement of initial and continued compliance with the performance standards in Section 43.33; and provided further, that any proposed use may be required to be reviewed in conformance with the performance standards in Section 43.30 at any time before or after issuance of a zoning certificate or building permit if, in the opinion of the zoning or building inspector or the board, it is considered possible that such use may violate or may already be in violation of the performance standards prescribed in Section 43.33.

The following uses shall also be permitted without board review or performance standards procedure, but shall be subject to the certain specifications prescribed below in each instance.

- (1) Junk/Scrap Yards. If located not less than 200 feet from any R district; provided, that the use shall not involve the handling or storage of putrescible solid waste materials, and any outside storage areas are enclosed on all sides with a solid wall or uniform tight board fence, not less than 8 feet high and that such operation shall not be visible from the nearest street or highway.
  - (2) Transfer Stations as defined in Section 35.01. Provided that, any part of such use shall be located not less than 300 feet from any R or B district; that any outside storage areas are enclosed on all sides with a solid wall or uniform tight board fence, not less than 8 feet high, and that such operation shall not be visible from the nearest street or highway.
  - (3) Crematory. If located not less than 200 feet from any R district.
  - (4) Railroad yard and freight station. If located not less than 200 feet from any R district.
  - (5) Large Breweries, provided that no portion of any structure which is used for the production of malt liquors (excluding warehousing and storage) shall be located closer than 200 feet from any R District.
  - (6) Other uses. Any other use that is determined by the board to be of the same general character as the above permitted uses; provided, that it can comply with the performance standards in Section 43.33.
- (b) Conditional Uses. The following manufacturing uses shall be permitted in the M-2 district only if specifically authorized by the board in accordance with the provisions of Section 43.30; provided, that such uses can control the generation of any dangerous or offensive elements in their operation, so as to comply with the performance standards in Section 43.33 and subject to review in accordance with the performance standards procedure in Section 43.30 in all instances.
- (1) Acetylene manufacturing in excess of 15 pounds pressure per square inch.
  - (2) Acid manufacture, except as provided in this section.
  - (3) Asbestos manufacture.
  - (4) Automobile assembly.
  - (5) Bleaching, cleaning and dyeing plant.

- (6) Boiler shops, structural steel fabricating shops, railway car or locomotive shops, including repair metal working shops employing reciprocating hammers or presses over 20 tons rated capacity.
- (7) Distilling of liquors.
- (8) Brick, pottery, tile and terra cotta manufacturing.
- (9) Bulk station.
- (10) Candle or sperm oil manufacturing.
- (11) Cooperage works.
- (12) Dextrine, starch or glucose manufacturing.
- (13) Disinfectant, insecticide or poison manufacturing.
- (14) Enameling, lacquering or Japanizing, varnishing.
- (15) Emery cloth or sandpaper manufacturing.
- (16) Felt manufacturing.
- (17) Flour or grain mill.
- (18) Forge or foundry works.
- (19) Grain drying or poultry feed manufacturing, from refuse, mash or grain.
- (20) Hair or hair products manufacturing.
- (21) Lime or lime products manufacturing.
- (22) Linoleum, oil cloth or oiled goods manufacturing.
- (23) Match manufacturing.
- (24) Meat packing, stockyards or slaughterhouses must comply with the requirements of distance from other districts, as set out in this section.
- (25) Paper and pulp manufacturing.
- (26) Perfume manufacturing.
- (27) Pickle, sauerkraut or sausage manufacturing.
- (28) Plaster manufacturing.
- (29) Poultry slaughterhouse, including packing and storage for wholesale.
- (30) Printing ink manufacturing.
- (31) Radium extraction.
- (32) Sandblasting or cutting.
- (33) Sawmill, the manufacture of excelsior, wood fiber sawdust products.
- (34) Sewage disposal plant.
- (35) Shoddy manufacturing.
- (36) Shoe blacking or polish or stove polish manufacturing.
- (37) Steam power plant, except where accessory to a permitted principal use.
- (38) Slag piles.

The provisions of this section shall also apply to any other use which, in the opinion of the zoning inspector or board, is of a similar character with respect to the emission of dangerous or offensive elements to the uses listed above.

- (c) Location of Certain Uses. Any of the following uses, in addition to the performance standards in Section 43.33 and performance standards procedure in Section 43.30, shall be located not less than 600 feet from any R district and not less than 200 feet from any M-1 or B district.
- (1) Manufacturing uses involving primary production of the following products from raw materials:
    - a. Asphalt, cement, charcoal and fuel briquettes.
    - b. Aniline dyes, ammonia, carbide, caustic soda, cellulose, chlorine, carbon black and bone black, creosote, hydrogen and oxygen, industrial alcohol, nitrates of an explosive nature, potash, plastic materials and synthetic resins, pyroxylin, rayon yarn, and hydrochloric, nitric, phosphoric, picric and sulfuric acids.

- c. Coal, coke, and tar products, including gas manufacturing; explosives, fertilizers, gelatin, animal glue and size.
  - d. Turpentine.
  - e. Rubber and soaps, including fat rendering.
- (2) The following processes: nitrating of cotton or other materials; magnesium foundry; reduction, refining, smelting and alloying of metal or metal ores; refining petroleum products, such as gasoline, kerosene, naphtha, lubricating oil; distillation of wood or bones; storage, curing or tanning of raw, green or salted hides or skins.
  - (3) Stockyards, etc. Stockyards and slaughterhouses, except for poultry.
  - (4) Explosives. Storage of explosives or fireworks, except where incidental and accessory to a use which is not subject to a distance requirement.
  - (5) Other uses. Any other use which is determined by the board to be of the same general character as the uses in this subsection (c).
- (d) Accessory Uses. Accessory uses and structures permitted and as regulated in the M-1 district, except as hereinafter modified, and such other uses and structures customarily accessory and incidental to any M-2 use shall be permitted in the M-2 district.

In addition, exterior signs which pertain to a permitted use on the premises and billboards and outdoor advertising signs and structures shall be permitted in the M-2 district, subject to the provisions in Section 43.43.

- (e) Required Conditions.
- (1) Enclosure not required. Any use may be conducted in the M-2 district within or without a building or enclosure, subject only to performance standard distance requirements where applicable, except as otherwise provided.
  - (2) Enclosure of junk yards. All junk yards shall be enclosed by a solid board fence or wall not less than 8 feet high.
- (f) Prohibited Uses. The following uses are prohibited in the M-2 district:
- (1) Dwellings, etc. Dwellings and residences of any kind, including motels, trailers, parks, also schools, hospitals, clinics and other institutions for human care, except where incidental to a permitted principal use; provided, however, that any such uses legally existing in the M-2 district at the time of adoption of this chapter or any amendment thereto, shall not be classified as a nonconforming use and subject to the provisions of Section 43.32.
  - (2) Business and services. Business uses and service establishments including restaurants, except when incidental and accessory to a permitted principal use and except service stations and such business, commercial and other uses as are first permitted in the B-3 district.
- (g) Height Regulations. Height regulations in the M-2 district shall be the same as in the M-1 district.

(h) Lot Area, Frontage and Yard Requirements. The following minimum requirements shall be observed in the M-2 district, except as modified by the provisions of Section 43.53(a) through (e):

<u>Lot Areas</u>	<u>Frontage Depth</u>	<u>Front Yard</u>	<u>Side Story</u>	<u>Yard One</u>	<u>Width Both</u>	<u>Rear Yard Depth</u>
Nonresidential Structures	None	25 ft.	None except when adjoining R district - then not less than 50 ft. each side yard.			1-story 40 ft. 2-story 50 ft. 3-story 60 ft. Five feet more each additional story.
Dwellings or residential parts of nonresidential buildings			Not permitted in M-2 district (Existing dwellings: Same as R-3)			

(08-15-59)

Ord. No. 2767 07/01/85  
Ord. No. 3759 01/07/08

## DIVISION 2. BOARD OF ADJUSTMENT

43.30 PERFORMANCE STANDARDS PROCEDURE. The board of adjustment shall have the power to authorize, upon application in specific cases, filed as hereinafter provided, issuance of a zoning certificate for uses that are subject to performance standards procedure under Section 43.63 as provided in the following:

- (a) Application. An application for a zoning certificate for a use subject to performance standards shall be submitted in duplicate on a form prescribed by the board of adjustment. The applicant shall also submit in duplicate a plan of the proposed construction or development, including a description of the proposed machinery, processes, products and specifications for the mechanisms and techniques to be used in restricting the emission of dangerous and objectionable elements as set forth in Section 43.33, in accordance with rules prescribed by the board specifying the type of information required in such plans and specifications. The fee for such application shall include the cost of the special reports that may be required to process it, as set forth in Subsection (b) of this section.
- (b) Report by Specialists. If, in its opinion, the proposed use may cause the emission of dangerous or objectionable elements, the board may refer the application to one or more specialists qualified to advise as to whether a proposed use will conform to the applicable performance standards specified in Section 43.33 for investigation and report. Such consultant shall report as promptly as possible after his receipt of such application. A copy of such report shall be promptly furnished to the applicant.
- (c) Review by Board. Within 30 days after the board of adjustment has received such application or such report, if a report was required, or within such further period as agreed to by the applicant, the board shall decide whether the proposed use will conform to the applicable performance standards, and on such basis shall authorize or refuse to authorize issuance of a zoning certificate or require a modification of the proposed plan of construction or specifications, proposed equipment or operation. Any zoning certificate so authorized and issued shall be conditioned upon, among other things:
  - (1) The applicant's completed buildings and installations conforming in operation to the applicable performance standards.
  - (2) The applicant paying the fees for services of the expert consultant deemed reasonable and necessary by the board to advise the board as to whether or not the applicant's completed buildings and installation in operation will meet the applicable performance standards.
- (d) Continued Enforcement. The zoning administrator shall investigate any purported violation of performance standards and, if there is reasonable grounds for the same, shall notify the board of the occurrence or existence of a probable violation thereof. The board shall investigate the alleged violation, and for such investigation, shall employ qualified experts. If, after public hearing on due notice, the board finds that a violation occurred or exists, a copy of such findings shall be forwarded to the city council. The services of any qualified experts employed by the board to advise in establishing a violation shall be paid by the violator if such violation is established, otherwise by the city.

Only those uses specified in the M-2 district as subject to performance standards and use accessory thereto, are subject to performance standards procedure specified in this section in obtaining a zoning certificate, unless the zoning administrator has reasonable grounds to believe that another

proposed use is likely to violate performance standards, in which event the applicant shall comply with performance standards procedure in obtaining a zoning certificate. (08-17-59)

Ord. No. 2327 03/1/76

## ARTICLE IV. PERFORMANCE STANDARDS

## 43.33 PERFORMANCE STANDARDS.

- (a) Compliance with Regulations. No land or building in any district shall be used or occupied in any manner so as to create any dangerous, injurious, noxious, or otherwise objectionable fire, explosive or other hazard, noise or vibration, smoke, dust, odor or other form of air pollution, heat, cold, dampness, electrical or other substance, condition or element in such a manner or in such amount as to adversely affect the surrounding area or adjoining premises (referred to herein as "dangerous or objectionable elements"); provided, that any use permitted or not expressly prohibited by this chapter may be undertaken and maintained if it conforms to the regulations of this section limiting dangerous and objectionable elements at the point of the determination of their existence. (08-17-59)
- (b) Enforcement Provisions Applicable to Other Uses. Even though compliance with performance standards procedure in obtaining a zoning certificate is not required for a particular use, initial and continued compliance with performance standards is required of every use and provisions for enforcement of continued compliance with performance standards shall be invoked by the zoning administrator or board as the case may be, against any use, if there are reasonable grounds to believe that performance standards are being violated by such use. (08-17-59)
- (c) Nonconforming Uses. Certain uses established before the original effective date of the regulations of this chapter and nonconforming as to performance standards shall be given a reasonable time in which to conform therewith, as provided in Section 43.32(e). (08-17-59)
- (d) Locations where Determinations are to be Made for Enforcement of Performance Standards. The determination of the existence of any dangerous and objectionable elements shall be made at the location of the use creating the same and at any points where the existence of such elements may be more apparent (herein referred to as "at any point"); provided, however, that the measurements necessary for enforcement of performance standards set forth in this section shall be taken at different points in different districts in relation to the establishment or use creating the element being measured (herein referred to as "point of measurement") as follows:
- (1) In any R District and B-1 and B-2 Districts. Twenty-five feet from the establishment or use or at the lot line of the use, if closer to the establishment or use.
  - (2) In B-2.5, B-3 and M Districts. At the boundary of the district or at any point within an adjacent R district.
- (e) Performance Standards, Regulations. The following provisions, standards and specifications shall apply:
- (1) Fire and explosion hazard. All activities involving and all storage of inflammable and explosive materials shall be provided at any point with adequate safety devices against the hazard of fire and explosion and adequate firefighting and fire suppression equipment and devices standards in the industry. Burning of waste materials in open fire shall

be prohibited at any point. The relevant provisions of state and local laws and regulations shall also apply.

- (2) Radioactivity or electric disturbance. No activities shall be permitted which emit dangerous radioactivity at any point or electrical disturbance adversely affecting the operation at any point of any equipment other than that of the creator of such disturbance.
- (3) Noise. Repealed 04/16/79.
- (4) Vibration. No vibration shall be permitted which is discernible without instruments at the points of measurement specified in subsection (d) above.
- (5) Smoke. No emission shall be permitted at any point, from any chimney or otherwise, of visible gray smoke of a shade equal to or darker than No. 2 of the Power's Micro-Ringlemann Chart, published by McGraw-Hill Publishing Company, Inc., and copyright 1954 (being a direct facsimile reduction of the standard Ringlemann Chart as issued by the United States Bureau of Mines), except that visible gray smoke of a shade equal to No. 2 on said Chart may be emitted for 4 minutes in any 30 minutes. These provisions applicable to visible gray smoke shall also apply to visible smoke of different color but with an apparently equivalent capacity.
- (6) Odors. No emission shall be permitted of odorous gases or other odorous matter in such quantities as to be offensive at the points of measurement specified in subsection (d) above. Any process which may involve the creation or emission of any odors shall be provided with a secondary safeguard system, so that control will be maintained if the primary safeguard system should fail. There is hereby established as a guide in determining such quantities of offensive odors Table III, "Odor Thresholds," in Chapter 5 "Air Pollution Abatement Manual," copyright 1951 by Manufacturing Chemists' Assn., Inc., Washington, D.C.
- (1) Fly ash, dust, fumes, vapors, gases, and other forms of air pollution. No emission shall be permitted which can cause any damage to health, to animals, vegetation or other forms of property, or which can cause any excessive soiling, at any point; and in no event any emission, from any chimney or otherwise, of any solid or liquid particles in concentrations exceeding 3/10 grains per cubic foot of the conveying gas at any point. For measurement of the amount of particles in gases resulting from combustion, standard corrections shall be applied to a stack temperature of 500 degrees Fahrenheit and 50 percent excess air.
- (2) Glare. No direct or sky-reflected glare, whether from floodlights or from high-temperature processes, such as combustion, welding or otherwise, so as to be visible at the points of measurement specified in subsection (d) above. This restriction shall not apply to signs otherwise permitted by the provisions of this chapter.
- (3) Liquid or solid wastes. No discharge at any point into any public sewer, private sewage disposal system or stream or into the ground, except in accord with standards approved by the department of health of the state

or standards equivalent to those approved by such department for similar uses of any materials of such nature or temperature as can contaminate any water supply or otherwise cause the emission of dangerous or offensive elements. (08-17-59)

Ord. No. 2327 03/01/76 Ord. No. 3788 04/06/09

## NOISE POLLUTION

39.01 **DECLARATION OF POLICY.** It is the public policy of the city to eliminate existing noise pollution; to limit, as much as is economically, socially, and technically feasible, further increases of sound levels; to protect human health and welfare, animal life and property, and the enjoyment of life and property in all residential, recreational, business, public and industrial areas in the city. It is necessary for the city to provide means for the control, prevention, prohibition and abatement of noise and noise pollution.

39.02 **DEFINITIONS.** The following definitions shall apply in the interpretation and enforcement of this chapter:

**Air Circulation Device:** A mechanism designed and used for the controlled flow of air used in ventilation, cooling, or conditioning, including, but not limited to, central and window air conditioning units.

**Ambient Sound:** The all-encompassing sound associated with a given environment, being usually a composite of sounds from many sources near and far.

**City Official:** Any representative of the city designated by the city manager.

**Cut-Out or By-Pass or similar device:** A mechanism which varies the exhaust system gas flow so as to discharge the exhaust gas and acoustic energy to the atmosphere without passing through the entire length of the exhaust system including all exhaust system sound attenuation components.

**dBA:** A unit of sound level. dBA is the weighted sound pressure level by the use of the "A" metering characteristic and weighting as specified in the American National Standards Institute (A.N.S.I.) Specification for Sound Level Meters, S1. 4-1971. For the purpose of this chapter dBA is used as a measure of human response to sound.

**Decibel:** A unit of sound pressure level, abbreviated dB.

**Exhaust System:** A combination of components which provides for enclosed flow of exhaust gas from engine parts to the atmosphere.

**Highway:** Any street, road, alley or public way in the city.

**Holiday:** Any day fixed by the United States or by Minnesota State law for suspension of business in whole or in part.

**Lake Park:** See definition in Section 55.11 of this Code.

**L<sub>10</sub>:** The sound level, expressed in dBA, which is exceeded 10 percent of the time for a one hour survey, as measured by test procedures approved by the director of the Minnesota Pollution Control Agency.

**L<sub>50</sub>:** The sound level, expressed in dBA, which is exceeded 50 percent of the time for a one hour survey, as measured by test procedures approved by the director of the Minnesota Pollution Control Agency.

**Motor Vehicle:** Any self-propelled vehicle not operated exclusively upon railroad tracks and any vehicle propelled or drawn by a self-propelled vehicle.

**Noise:** Any sound not occurring in the natural environment, including, but not limited to, sounds emanating from aircraft and highways, and industrial, commercial, and residential sources.

Noise Pollution is: (a) Noise which unreasonably annoys, injures or endangers the safety, health, morals, comfort or repose of any considerable number of members of the public, or

(b) The presence of a noise or combination of noises exceeding the source sound levels hereinafter set forth, or

(c) An act enumerated herein as a public nuisance.

Person: Any individual, firm, partnership, corporation, trustee, association, the state and its agencies and subdivisions, or any body of persons, whether incorporated or not and with respect to acts prohibited or required herein shall include employees and licensees, owners, tenants, and occupants.

Sound: An oscillation in pressure, stress, particle displacement, particle velocity, etc., in an elastic or partially elastic medium, or the superposition of such prorogated alterations.

Sound Amplification Equipment: A radio, phonograph, or any device or apparatus for the reproduction or amplification of the human voice or other sounds.

Sound Level: A weighted sound pressure level obtained by the use of a sound level meter having characteristics, including the "A" weighting, as specified in A.N.S.I. Specifications for Sound Level Meters, S1. 4-1971. The reference pressure is 20 micronewtons per square meter.

Sound Pressure Level: Expressed in dB, is 20 times the logarithm to the base 10 of the ratio of the pressure of a sound to the reference pressure (20 micronewtons per square meter).

Sound Receiving Unit: A unit of property or a building containing a person, business, activity, animal life, or property which is affected by noise or noise pollution.

Vibration: Refers to the oscillation of a solid body or material, including, but not limited to, earth, concrete, machinery, building structures, or other similar materials. Within this chapter the term vibration shall refer to those oscillations which are disturbing, injurious, damaging, or dangerous.

Ord. No. 2589 09/08/81.

39.03 SOURCE REQUIREMENTS. (a) The source sound level requirements of this section shall apply at the property or zoning lines of the sound receiving unit. Measurements may be made at any location in zoning districts for evaluation purposes and to aid in the enforcement of other sections of this chapter.

(b) The source sound levels as stated below in subsection (c) shall be the highest source levels permitted in each zoning district.

(c) Source requirements: Ord. No. 3788 4/6/09

Zoning District	Day (7 a.m. - 10 p.m.)		Night (10 p.m. - 7 a.m.)	
	L <sub>50</sub>	L <sub>10</sub>	L <sub>50</sub>	L <sub>10</sub>
R-1, R-2, R-3, C-1	60	65	50	55
B-1, B-2, B-3	65	70	65	70
B-2.5, M-1, M-2	75	80	75	80

(d) Sound levels resulting from travel of motor vehicles on state and county highways are exempt from these noise source requirements but not other sections of this chapter relating to motor vehicles operated in other areas. It is the intent of the city to reduce highway noise in the various land areas surrounding highways to or below the source requirements of this section when and wherever possible.

(e) All sound levels originating in any development or property which contains one or more buildings and which is without property lines for each building shall not exceed the source requirements for the applicable zoning district measured at the area of human activity, or if this is ill-defined, at any point on a line, all of whose points are equidistant from any two buildings

# MEMORANDUM

DEPARTMENT OF COMMUNITY DEVELOPMENT/PLANNING DIVISION

**TO:** City Council

**FROM:** Judy Bodway, Acting City Manager; Carlos Espinosa, Assistant City Planner

**DATE:** January 6, 2012

**SUBJECT:** Frac Sand Report

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## Introduction

This memo is meant to provide information on frac sand activities in Winona – specifically in preparation for the January 9, 2012 special Council meeting. The following report represents staff's most up to date information on frac sand mining and processing in the City of Winona. This report was created in response to Council concerns and questions regarding frac sand mining and processing in the City.

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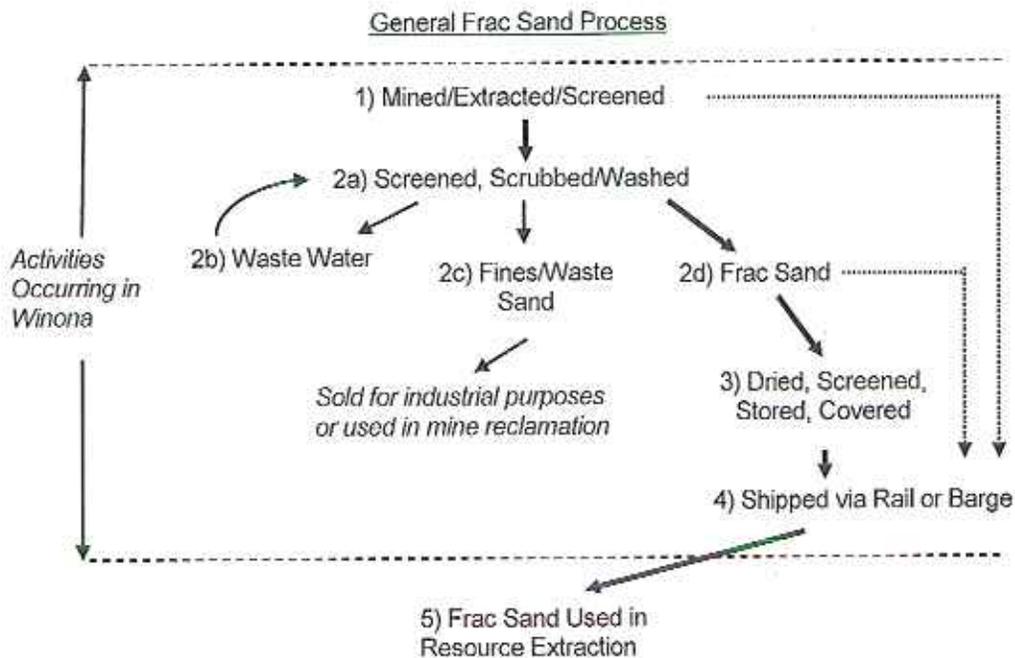
## Attachments:

- 1) Map: Existing and Proposed Frac Sand Operations in Winona
- 2) Air Quality Report

## Existing and Proposed Operations

The attached map shows the existing and proposed frac and operations in the City of Winona. It is important to note that all activities have been treated as permitted or grandfathered uses in the zoning districts where they are located (see zoning discussion below). As a result, the existing activities have not required formal public hearings or approval by Council. This is in contrast to the current frac sand mining Conditional Use Permit applications in Winona County requiring public hearings and approval by the County Board.

Currently, frac sand activities in Winona generally fall into three categories: 1) Mining/extraction, 2) Processing/washing, and 3) Drying/shipping (see attachment one). These activities are shown as part of the general frac sand process below:



Two main parties are involved in Winona's existing frac sand operations. The first is Steve Kohner of Winona Aggregate in coordination with the owners of Biesanz Stone Company and Sierra Frac Sand – a company from Texas. In Winona, this party receives sand from the Biesanz quarry and from Wisconsin. The sand is mined and processed in Winona then shipped out of state. Some of the sand is washed before shipping and some is not.

The second party consists of Bob Hemker of BRANNT Valley Excavating and Rich Mikrut of Mikrut Properties LLLP in coordination with Arepet Sand Ventures – a company from Texas. This party receives sand from Wisconsin and other sources, washes it in Winona, and then ships the sand out of state.

### Mining/Extraction

Active:

- 4600 Goodview Road – Biesanz Quarry

The frac sand mining/extraction activities in the City of Winona are occurring at the Biesanz quarry. The mined sand comes from the Jordan sandstone formation. In order to reach the frac sand, blasting through 40 feet of fractured limestone has occurred. Once the Jordan formation is reached, minor blasts are often utilized to break up the sandstone. When the sand is mined, it has a 5-15% moisture content.<sup>1</sup> At the mine site, the sand is passed through an initial screener before being sent to the washing site at 6930 West 5<sup>th</sup> Street in Minnesota City.

At this time, it is staff's understanding that any future expansion of the Biesanz mine will not encroach on Knopp Valley residential properties (measured from top of bluff to property lines). Any future expansion of the mine onto adjacent properties will require Agricultural (A-G) zoning and a Conditional Use Permit (CUP). The existing mine property does not have a CUP. Staff is currently working with the City Attorney on how the property (without a CUP) should be handled.

The Biesanz quarry is subject to numerous regulations from a number of regulatory agencies. The regulations include:

- Overall workplace/operational activities regulated by the Mine Safety and Health Administration (MSHA) and the Occupational Safety and Health Administration (OSHA). Compliance visits are unannounced.
- Air Quality – Ambient (outdoor) air quality is monitored by the Minnesota Pollution Control Agency. MPCA renewed Biesanz's permits approximately 1 year ago.

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<sup>1</sup> Moisture content is important because it determines the potential for particulate emissions (dust) from sand processing. See page 14 for detail on moisture content throughout sand processing activities in Winona. Sand is considered wet at greater than 3% moisture content. Basically, sand with a moisture content lower than .5% has the greatest potential to create dust.

- Water – MPCA regulates storm water/water runoff from the mining site. The MPCA also regulates the stone fabrication water treatment process in Biesanz's manufacturing operations.
- Vibration control – Regulated by the Office of Surface Mining with the assistance of the State Fire Marshall. Explosives use is regulated by Bureau of Alcohol Tobacco and Firearms.
- Quarry Noise – Regulated by Mining Safety and Health Administration (MSHA).
- City Blasting Permit - Application contains the operator's contact information, trained personnel, emergency response plan and evidence of liability insurance not less than \$5,000,000, schedule of estimated blasting, location of the blast area and communication plan.

#### Processing/Washing

##### Active:

- 6930 West 5<sup>th</sup> Street in Minnesota City
- 2100/2121 Goodview Road

##### Proposed:

- 1280-1330 Frontenac Drive

When frac sand is processed, screens and water are used to remove waste from raw mined sand. The waste includes large rocks and aggregate as well as small sand fines, leaving only frac sand at the end of the process. The washing process removes 15 - 20% of the material in raw sand. After the frac sand is washed, it has a 15 - 25% moisture content (i.e. "sopping" wet). The wet sand is then sent to shipping facilities.

There is typically a small amount of large waste material (due to initial screening at mine sites). The majority of the waste material is sand fines and clay which are pumped into closed-loop ponds to naturally settle. After the waste sand/material is separated, it is either sold for industrial purposes or used in mine reclamation.

#### Drying and Shipping

##### Active Shipping:

- Property East of 70 Gould Street
- Port Authority Dock
- 370 West Second Street

#### Proposed Drying and Shipping:

- 25 McConnon Drive

Frac sand can be shipped unprocessed, processed/washed, or when dry. At this time no dry frac sand is being shipped from Winona. The sand that is shipped is either unprocessed or washed. This means that the sand is still relatively wet when it leaves Winona. Most of the sand shipped from Winona goes south to the Texas/Oklahoma area.

The proposed drying and shipping facility at 25 McConnon drive has site plan approval. The owner, Rich Mikrut, is in the process of prepping the facility. At 25 McConnon Drive, wet frac sand will be delivered and stockpiled, then brought indoors via conveyor belt. Once inside, the wet sand will run through drying and sorting machinery before being stockpiled in an enclosed building. Finally, the dry sand will be loaded onto sealed railcars via conveyor belt. The MPCA has issued an air quality permit for the sand drying machinery at the facility.

### City Regulations

The City regulations that apply to frac sand mining and processing include zoning, noise thresholds, truck routes, and site plans.

#### Zoning

Frac Sand operations are permitted in the specific zoning districts listed below:

##### Mining and Extracting:

- A-G (Agricultural) District with Conditional Use Permit (CUP)

##### Processing (Washing/Scrubbing, and Drying, Screening, Storing):

- A-G (Agricultural) District with Conditional Use Permit (CUP)
- M-2 (General Manufacturing) District in accordance with performance standards (noise, dust, etc.)
- M-1 (Light Manufacturing) District provided all processing activities are enclosed and in accordance with performance standards

The general characteristics of frac sand mining and processing (i.e. heavy industrial use, outdoor equipment, outdoor operations) basically relegate the uses to Agricultural (A-G) and M-2 General Manufacturing zones.

The mining activity at Biesanz Stone and the sand processing activity at 2100/2121 Goodview Road are located in the A-G district, but do not have Conditional Use Permits (CUPs). Since Biesanz Stone's property was already being used for mining when Winona Township was annexed into the City (1996) and 2100/2121 Goodview Road was used for aggregate processing prior to frac sand, staff has treated the sand mining and processing operations as conforming uses grandfathered in at their current locations. However, staff is working with the City Attorney to define exactly how these uses (without CUPs) should be handled.

All other existing and proposed frac sand processing and shipping uses are in the M-2 zoning district. The M-2 zoning district permits heavy industrial uses and requires Conditional Use Permits for uses that are "dangerous or offensive" (e.g. bleaching, cleaning and dyeing plants, foundries, sawmilling, paper manufacturing, etc.). Such dangerous or offensive uses are required to undergo a performance standard review process through the Board of Adjustment. In the review, a report by specialists may be required, and results of the process are transmitted to Council. Because staff has not classified frac sand processing as "dangerous or offensive," existing frac sand operations have not been required to go through this process. However, if at any time such uses are in violation of performance standards (related to dust, fire and explosion hazard, vibration, smoke, etc.) formal review may be required.

#### Performance Standards

Performance standards are meant to help control dangerous or offensive emissions from all land uses in the City. If a performance standard is alleged to be violated, staff investigates and typically resolves the issue with the property owner without formal review of the purported violation. However, formal review (through the performance standards procedure mentioned above) may be required if the violation is not solved.

#### Miscellaneous Zoning Regulations

Other parts of the zoning code also apply to sand mining and processing. In particular, regulations for parking areas and driveways require that surfaces are reasonably maintained. This means that gravel driveways (or maneuvering areas) may not create excessive dust (which travels to neighboring properties) or mud/debris that is tracked out onto adjacent roads. Staff has referenced this regulation along with state statutes pertaining to material spillage in working with frac sand operations at 2100/2121 Goodview Road and 370 West Second Street to clean up debris on adjacent roads. Staff is currently working with the operators of 370

West Second Street to hard surface driveways on the property. This will help reduce dust created onsite and debris tracked out of the operation.

### Noise Thresholds

City Code Chapter 39 regulates noise pollution by zoning district. At this point, the A-G zone is not listed in the chapter, but staff would suggest listing it along with other omitted zones (R-S, R-R, R-1.5 – see Next Steps Section). All other zones are included – meaning all frac sand operations in the M-2 zone are subject to the noise regulations. The noise regulations require such uses adjacent to residential districts to be relatively quiet between the hours of 10 p.m. and 7 a.m. The regulations are in decibels measured over the course of an hour. In general, an increase of 10 decibels is perceived to be twice as loud. See below for the decibel requirements:

(c) Source requirements: Ord. No. 3788 4/6/09

<u>Zoning District</u>	<u>Day (7 a.m. - 10 p.m.)</u>		<u>Night (10 p.m. - 7 a.m.)</u>	
	<u>L<sub>50</sub></u>	<u>L<sub>10</sub></u>	<u>L<sub>50</sub></u>	<u>L<sub>10</sub></u>
R-1, R-2, R-3, C-1	60	65	50	55
B-1, B-2, B-3	65	70	65	70
B-2.5, M-1, M-2	75	80	75	80

### Truck Routes

Truck routes are established in Chapter 61 Table G of the City Code. Truck routes run on and connect to arterial roads (see attachment one). Deviations off truck routes are permitted to reach individual businesses. Truck routes are rated for up to 80,000 pounds gross weight with a maximum of 10 tons per axle. Staff is currently working with the City Attorney on how to establish designated truck routes for the frac sand operations in Winona (see Next Steps Section).

### Site Plans

Site plans are required for any new development in accordance with City Code Chapter 44.06. There is no definition of development, but staff generally requires site plans for land use changes and construction of buildings. In the site plan approval process, staff ensures that site planning, zoning, public works, fire, and police requirements are met for developments. Site plan approval is required before the issuance of a building permit. In accordance, the typical trigger for a site plan review is the construction of a new building. The existing frac sand operations did not undergo site plan review for three reasons:

1. Each involves relatively similar uses to those previously existing.
2. No buildings have been erected.

3. There have been no new connections to public utilities.

The proposed frac sand operations at 25 McConnon Drive and 1280-1330 Frontenac Drive require site plan review. The site plan for 25 McConnon Drive was approved in May of 2011. A site plan for 1280-1330 Frontenac Drive has yet to be submitted.

## State Regulations

The health concerns surrounding frac sand center on air pollution and water pollution. Both areas are typically regulated by the state Department of Natural Resources and/or the Minnesota Pollution Control Agency (MPCA). The air pollution concerns are mainly with the generation of crystalline silica. The water concerns center on the potential pollution of groundwater, surface water, and water runoff.

### Air Pollution Discussion

When sand is mined or processed dust is created. The dust comes from disturbance and creation of small particles which become airborne. Although dust may range from 1 micron to 1 millimetre diameter,<sup>2</sup> the primary health concerns are with dust particles less than 10 microns (1/7<sup>th</sup> the diameter of a human hair). Particles of this size are small enough to be inhaled into the deepest part of the lungs. This size of dust is referred to as PM10 (particulate matter smaller than 10 microns). Sources of PM10 emissions include:

1. Motor vehicles
2. Wood burning stoves and fireplaces
3. Dust from construction, landfills, and agriculture
4. Wildfires and brush/waste burning
5. Industrial sources
6. Windblown dust from open lands<sup>3</sup>

When PM10 is created through frac sand mining and processing, a certain portion of the particulates may be crystalline silica dust. For many years, excessive exposure to crystalline silica dust in the workplace has been linked to adverse health effects such as silicosis and regulated accordingly.<sup>4</sup> However, the health risks of silica in the ambient (outdoor) air are not proven. According to the American Chemistry

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<sup>2</sup> Dust: particles of solid material in the broad size range of 1 micron to 1 millimetre diameter. Anything of a larger particle size is too heavy to remain airborne. See: page 13 for a table of dust and sand sizes.

<sup>3</sup> See: <http://www.arb.ca.gov/html/brochure/pm10.htm>

<sup>4</sup> According to the Wisconsin DNR, "Silicosis is a chronic, progressive inflammatory and fibrotic (i.e. causes lung scarring) disease of the lung." See page 15 for a discussion of different types of silicosis resulting from different exposure levels.

Council, "there is no evidence indicating that concentrations of crystalline silica in the ambient air have caused silicosis or any other silica-related disease in the general population."<sup>5</sup> Nevertheless, various governmental organizations have set benchmark levels for exposure to crystalline silica to help prevent potential health effects.<sup>6</sup>

The benchmark levels of safe silica exposure vary widely, but perhaps the most widely circulated standard is the 3ug/m<sup>3</sup> (3 micrograms per cubic meter) exposure level adopted by California's Office of Environment Health Hazard Assessment. This "three micrograms per cubic meter" standard is a weight/mass measurement based on an annual average (exposure may be more or less on a daily basis, but should average out to less than the 3ug/m<sup>3</sup> standard at the end of the year). This standard is for PM 4 size particles (particles less than 4 microns in diameter). Two main issues with this standard are that "there are no generally accepted methods for monitoring PM 4 in ambient air", and "there is no standard method for monitoring crystalline silica in the ambient air."<sup>7</sup> However, there are federal and state methods and standards for monitoring PM10 (which would include PM 4 crystalline silica size particles).<sup>8</sup>

A 1996 report by the Environment Protection Agency stated that it's reasonable to assume 10% of PM10 in the United States is crystalline silica.<sup>9</sup> Based on this percentage, a corresponding "safe" exposure level would be 30ug/m<sup>3</sup> annual average PM10 (10% of 30ug = 3ug – the California standard mentioned above).<sup>10</sup> The existing state air quality standard of 50ug/m<sup>3</sup> enforced by the MPCA comes very close to this standard. In fact, the EPA has estimated that risk of silicosis to healthy populations continuously exposed to the existing state standard for seventy (70) years is less than one percent (1%).<sup>11</sup> In Winona, the fact that most frac sand is processed and transported wet (greater than 3% moisture) greatly mitigates the potential for PM10 (and crystalline silica) emissions from frac sand operations.

When sand is mined and processed there is the potential for PM10 emissions from blasting (initial breaking apart of sand), conveying, screening, transportation, and storing the product. However, if the sand is continually wet during these processes,

<sup>5</sup> Wisconsin Department of Natural Resources. *Report to the Natural Resources Board: Silica Study*. 9/30/2011. Pg. 54. Available at: <http://dnr.wi.gov/air/pdf/finalsilicareport.pdf>

<sup>6</sup> See above pg. 11.

<sup>7</sup> See above pg. 1 and 14 respectively.

<sup>8</sup> See pages 15-16 for a listing of state and federal PM ambient air regulations.

<sup>9</sup> US EPA. *Ambient Levels and Noncancer Health Effects [i.e. silicosis] of Inhaled Crystalline and Amorphous Silica*. 1996. Pg. 3-30. Available at <http://www.epa.gov/NCEA/pdfs/0604.pdf>

<sup>10</sup> Pierce, Crispin. *Health Risks of Frac Sand Mining and Processing*. Presentation at the 2011 National Environmental Health Association meeting. Available at: <http://people.uwec.edu/piercech/presentations.htm>

<sup>11</sup> Regis, Linda. *From the Sandbox to Sandblasting: Regulation of Crystalline Silica*. 17 Pace Envtl. L. rev. 207 (1999). Pg. 24. Available at: <http://digitalcommons.pace.edu/pelr/vol17/iss17/>

"process emissions are often negligible."<sup>12</sup> These facts are supported by air testing results from existing frac sand operations in Winona.

Air quality monitoring for particulate emissions was completed December 2, 2011 for three frac sand operations in the Winona area: the Biesanz quarry, Winona Aggregate, and the Modern Transport Rail Loading Terminal. The monitoring was conducted by a certified industrial hygienist and analyzed by a laboratory from East Syracuse, New York. The results of the air testing show *no crystalline silica was detected*, and all *PM10 results were within EPA guidelines for 24-hour exposure* (see attachment two).

Dry sand with a moisture content .5% or lower has the greatest potential to create dust and particulate emissions. Sand processed in Winona will generally only reach this level of moisture in large quantities after being dried. After going through the drying process, the sand is stored indoors or transported in closed containers and not exposed to the outdoors – thus greatly reducing any potential PM risks to the public.

Staff has submitted questions regarding the measurement of particulate matter and enforcement procedures to the MPCA. The questions submitted were in regard to the air permit already granted to 25 McConnon Drive and MPCA air permits in general. At this time the MPCA is delaying response to these questions because of the number of questions the agency has received regarding frac sand regulation. The agency is currently working on how best to respond to all such inquiries. Answers to these questions are expected by late January at the earliest.

In summary, given the lack of evidence that silica in the ambient air is a public health concern, existing PM regulations, the PM mitigating characteristics of sand processing in Winona, and the air quality test results from existing frac sand operations, it may be premature to set local standards specifically for crystalline silica in Winona ambient air. A more fitting option could be to emphasize conformance with existing state regulations (see Next Steps Section).

#### Water Pollution Discussion

Concerns about water pollution center on groundwater, surfacewater, and water runoff.

Concerns about groundwater contamination are generally attached to mining operations. The Biesanz quarry is the only mining operation active in the City of Winona. The DNR is only involved with mining applications over 100,000,000 gallons and none are active or have been proposed in Winona County. In regard to

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<sup>12</sup> US EPA. Emission Factor Documentation for AP-42 Section 11.19.1 Sand and Gravel Processing. Final report. 1995. Pg. 2-11. Available at: <http://www.epa.gov/ttn/chieff/ap42/ch11/bgdocs/b11s19-1.pdf>

frac sand mining, Bruce A. Brown of the Wisconsin Geological Historical Survey stated the following at an August 2011 Barron County, Wisconsin Board meeting: "Sand mining has the same potential for groundwater impact as a limestone quarry or gravel pit. They're not using any noxious chemicals in the mining process. They're basically just digging the stuff out and usually hauling it away."<sup>13</sup> Details related to groundwater and the Biesanz quarry will be researched and provided as part of the newly formed Blasting Committee's review of operations at the mine site.

Concerns about surface water are generally attached to sand processing/washing. However, both of the existing sand processing/washing operations in Winona are closed-loop systems with no discharge into surrounding surface waters (e.g. the Mississippi). In these systems, the sand fines are washed out of the frac sand and then released along with the wash water into the closed-loop settling ponds. Here, the fines naturally settle without the use of flocculants (i.e. chemicals). The water from the settling ponds is then reused in the washing process with no discharge into adjacent surface waters. If any sand washing operations are using flocculants, MPCA approval is required. City staff will work with future washing operations to ensure all applicable permits are obtained and surface water is not impacted.

Basically any commercial project which disturbs land requires some type of stormwater management (water runoff) plan. If the proposed project disturbs one acre or more, a permit is required by the MPCA – in other cases, the City's engineering department issues a permit.

## Transportation

The mining and processing of frac sand involves a significant amount of transportation by truck. In Winona truck traffic is relegated to truck routes. Deviation from a truck route is only permitted to reach a specific place of business outside of the nearest route. City staff is currently working with the City Attorney to explore the option of requiring frac sand traffic to stay on specific routes.

Another consideration regarding transportation is how to account for the wear and tear on City roads from the trucks traveling to and from Winona. This complex subject is most likely part of a region-wide discussion due to the origins of trucks/locations of mines and the routes used to enter Winona. Staff will be taking part in a January meeting with region-wide planning and zoning officials to begin discussing this topic.

One concern about frac sand related truck traffic entering Winona from Wisconsin has been the ability of the interstate bridge to handle the increased traffic and

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<sup>13</sup> "Geologist Talks Sand to County Board." Retrieved 11/14/2011 from: <http://www.ricelakeonline.com/main.asp?SubSectionID=208&ArticleID=22316&SectionID=6>

corresponding weight loads. The weight limit for the bridge is 40 tons (80,000 lbs.) per truck. Mn/DOT is responsible for monitoring this limit. According to data from August 15-21, 2011, a total of 80,200 vehicles crossed the bridge during this time period. A total of 425 of these vehicles were over 80,000 lbs. in gross vehicle weight. Of the 425 overweight vehicles, 29 vehicles were over 90,000 lbs. Staff continues to work with the state to ensure Mn/DOT is aware of the traffic levels on the bridge.

Another concern about the transportation of frac sand is the covering of semi-trailers loaded with sand. According to Minnesota Statute 169.81, trucks carrying sand must be covered if:

- (1) the vertical distance from the top of an exterior wall of the cargo compartment to the load, when measured downward along the inside surface of the wall, is less than six inches; or
- (2) the horizontal distance from the top of an exterior wall of the cargo compartment to the load is less than two feet.

These provisions mean that not all trucks carrying frac sand are required to be covered. Nonetheless, staff has observed that a great majority of the trucks carrying frac sand are covered.

### **Direct Jobs Created**

The number of new jobs includes approximately 36 new positions in frac sand operations and 17+ new jobs in trucking. The jobs in frac sand operations have an approximate yearly wage of \$50,000+.

### **Miscellaneous Questions and Answers**

#### **What is frac sand?**

Frac sand is 99% quartz. This is different than "normal" sand which is 50 – 70% quartz. Quartz is very hard mineral composed of silica, SiO<sub>2</sub>, found worldwide in many different types of rocks. Quartz is the most common mineral in earth's crust.

Frac sand has a round shape. When used in hydraulic fracking, the roundness allows natural gas or oil to escape through "fractures" made in shale formations. The roundness of frac sand also helps it to withstand the high amounts of pressure used in fracking.

**What is the size of frac sand in comparison to visible dust and particulate matter?**

Note: 1 micron is equal to .001 millimeters (mm)

Description	Size	Misc. Info
<i>Dust</i>	<i>1 micron to 1 millimeter (mm)</i>	<i>Anything larger than 1 millimeter is too large to become airborne. Particles are visible at .04 millimeters.</i>
PM 2.5 (Fine Particulates)	Less than 2.5 microns  2.5 microns = .0025 (mm)	Finest particulates of most danger. Includes clay and very small silt particles.
PM 10 (Respirable dust)	Less than 10 microns.  10 microns = .01 (mm)	1/7 <sup>th</sup> the diameter of human hair. Includes clay and small silt particles. Particles not visible to naked eye.
Very Fine Sand	.05 - .1 (mm)	Floats in air when wind blows at 12 mph. Particles visible to naked eye.
Fine Sand	.10 - .25 (mm)	Moves in hopping motion when wind blows at 12 mph
Medium Sand	.25 - .5 (mm)	Includes common frac sand sizes. Most widely used frac sand size is .42 - .84 (mm) <sup>14</sup>
Coarse Sand	.5 - 1 (mm)	Includes common frac sand sizes. Most widely used frac sand size is .42 - .84 (mm)

**Will Frac Sand blow off stockpiles, trucks, or railcars?**

The sand grains typically used for frac sand are considered to be medium to large/coarse sized sand particles (.25 mm to 1 mm) which are less likely to become airborne dust. Fine sand grains (less than .25 mm) are more likely to become airborne simply because of their size. Based on staff's observations, the dust

<sup>14</sup> See: [http://www.victorynickel.ca/\\_resources/frac-sand\\_article.pdf](http://www.victorynickel.ca/_resources/frac-sand_article.pdf)

associated with frac sand is coming from disturbance of these finer grains or smaller particles from trucks traveling over dry gravel or hard-surfaced roads with excess debris on the road surface.

Additionally, regardless of the sand size, a majority of the sand traveling through Winona is in a relatively wet state (greater than 3% moisture). Above this level of moisture even very strong winds are unable to move sand grains.<sup>15</sup> Another consideration is that it generally takes a number of days (i.e. 3+) for a stockpile of sand to begin drying out to less than 4-5% moisture. To help reduce the potential for sand blowing off such stockpiles, one option is to require covering for stockpiles that are not being disturbed (see Next Steps Section).

As discussed previously, trucks carrying frac sand are required to be covered in most instances, and truck operators are required to clean the rear gates of trucks after unloading sand.

The frac sand loaded on rail is leveled off at the top of the railcar to help prevent sand from blowing off during transport. Staff is not aware of any regulations for covering such railcars.

It should be noted (as discussed previously), that once frac sand is fully dried (less than .5% moisture content) it is always covered and kept dry until used in the hydraulic fracturing process.

#### **What is wet frac sand?**

Wet sand has a moisture content of more than 3%. At this moisture level, water can be seen running off the material and sand can be easily clumped. Frac sand moving through Winona has the following general moisture content:

- 1) Mined/Unprocessed sand = 5% - 15%
- 2) Washed sand = 15% - 25%
- 3) Stockpiled sand = 5% -15%
- 4) Stockpiled sand during winter 4% -5%

When sand is dried, the moisture content reaches approximately .5%. It is at this point when the potential for dust/PM generation is greatest. Above this moisture percentage, dust generation drops off rapidly. In a 1995 study, researchers found that the dust generation rate of glass beads (i.e. quartz/frac sand) decreased by a factor of 100 (became 100 times smaller) when the moisture content increased from

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<sup>15</sup> See: <http://www.calvin.edu/academic/geology/coastaldunes/processes/wetsand.htm>

.5% to 1%.<sup>16</sup> As a result, because frac sand in Winona is generally transported and processed while relatively wet, the potential for PM and crystalline silica dust generation is greatly reduced.

### **What is silicosis and how is it caused?**

According to the Wisconsin DNR, "Silicosis is a chronic, progressive inflammatory and fibrotic (i.e. causes lung scarring) disease of the lung."<sup>17</sup> Silicosis has proven to be a concern to people in occupational (workplace) settings with high, long term exposures to crystalline silica dust without appropriate respiratory protection or dust suppression. There are three types of silicosis:

- 1) Acute - Occurring in workers after 2-5 years of frequent exposure to extremely high levels of silica dust.
- 2) Accelerated – Occurring in workers after 10 or more years of exposure to very high levels of silica dust.
- 3) Chronic – Occurring in workers exposed to fairly high levels of silica dust. Generally does not occur before 20 years of consistent high occupational exposure.

Cases of acute and accelerated silicosis essentially do not occur outside occupational settings.<sup>18</sup> Accordingly, concerns about crystalline silica in the ambient air relate to the potential for chronic silicosis – which takes many years to develop. The acceptable ambient air exposure level from California (3ug/m3) referenced previously is based off data from these documented occupational hazards with a significant safety factor included.<sup>19</sup>

### **What are the existing regulations for particulate emissions?**

National and state PM10 standards have been established through amendments to the 1970 National Clean Air Act. National (Environment Protection Agency Standards) are the following:

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<sup>16</sup> Plinke et. al. *Dust Generation from Handling Powders in Industry*. American Industrial Hygiene Association Journal (56) 1995. Pg. 255. Available at:

<http://www.unc.edu/courses/2009spring/envr754/001/Plinke.pdf>

<sup>17</sup> Wisconsin Department of Natural Resources. *Report to the Natural Resources Board: Silica Study*. 9/30/2011. Pg. 8.

<sup>18</sup> Hessel, Patrick. *The Potential for Silica-Related Health Effects from the Proposed Liberty Quarry*. 2007. Pg. 6.

<sup>19</sup> See above pg. 7.

National Ambient Air Quality Standards for Particle Pollution			
Pollutant	Primary Stds.	Averaging Times	Secondary Stds.
Particulate Matter (PM <sub>10</sub> )	Revoked <sup>(1)</sup>	Annual <sup>(1)</sup> (Arithmetic Mean)	
	150 µg/m <sup>3</sup>	24-hour <sup>(2)</sup>	Same as Primary
Particulate Matter (PM <sub>2.5</sub> )	15.0 µg/m <sup>3</sup>	Annual <sup>(3)</sup> (Arithmetic Mean)	Same as Primary
	35 µg/m <sup>3</sup>	24-hour <sup>(4)</sup>	Same as Primary

Units of measure for the standards are micrograms per cubic meter of air (µg/m<sup>3</sup>).

Footnotes:

(1) - Due to a lack of evidence linking health problems to long-term exposure to coarse particle pollution, the agency revoked the annual PM<sub>10</sub> standard in 2006 (effective December 17, 2006).

(2) - Not to be exceeded more than once per year on average over 3 years.

(3) - To attain this standard, the 3-year average of the weighted annual mean PM<sub>2.5</sub> concentrations from single or multiple community-oriented monitors must not exceed 15.0 µg/m<sup>3</sup>.

(4) - To attain this standard, the 3-year average of the 98th percentile of 24-hour concentrations at each population-oriented monitor within an area must not exceed 35 µg/m<sup>3</sup> (effective December 17, 2006).

Notice that the annual PM<sub>10</sub> standard has been revoked. The EPA revoked this standard because *available evidence does not suggest a link between long-term exposure to PM<sub>10</sub> and health problems.*<sup>20</sup> However, state standards do include an annual PM<sub>10</sub> standard:

Pollutant/Air Contaminant	Primary Standard	Secondary Standard	Remarks
PM-10	150 micrograms per cubic meter	same as primary standard	maximum 24-hour average concentration; the standard is attained when the expected number of days per calendar year exceeding the value of the standard is equal to or less than one
	50 micrograms per cubic meter	same as primary standard	annual arithmetic mean; the standard is attained when the expected annual arithmetic mean concentration is less than or equal to the value of the

<sup>20</sup> See: <http://www.epa.gov/air/particles/standards.html>

			standard
PM-2.5	65 micrograms per cubic meter	same as primary standard	maximum 24-hour average concentration; the standard is attained when the expected number of days per calendar year exceeding the value of the standard is equal to or less than one
	15.0 micrograms per cubic meter	same as primary standard	annual arithmetic mean; the standard is attained when the expected annual arithmetic mean concentration is less than or equal to the value of the standard

According to the MPCA, "No facility may emit any pollutant in such an amount or in such a manner as to cause or contribute to a violation of the[se] standard[s]," and "The Minnesota Pollution Control Agency (MPCA) may request that a facility provide information necessary to demonstrate compliance with ambient air quality standards."<sup>21</sup>

## Next Steps

Given the information discussed above, one option is for Council to draft specific language pertaining to sand washing and processing for inclusion in the M-2 zoning district. Because of the non-hazardous qualities of sand processing, staff would suggest incorporating sand processing into the M-2 zone as a permitted use subject to certain provisions. In this manner, sand processing facilities would not be required to obtain a Conditional Use Permit, but would be required to comply with such provisions. The provisions would apply to new/proposed sand processing facilities. Staff is currently working with the City Attorney to determine how such provisions would be applied to existing uses, but that said, provisions 1), 3), and 4) below could essentially be applied if existing frac sand operations are in violation of existing ordinances:

1. Hard Surfacing – In order to reduce the potential for dust generation, asphalt or concrete could be required in any truck or equipment maneuvering area.
2. Stockpile Covering – To reduce the potential that stockpiled sand is blown by the wind, covering could be required for stockpiles that are not disturbed for greater than 1 week.

<sup>21</sup> MPCA. Facts About General Air Quality Rules. 2003. Available at: <http://www.pca.state.mn.us/index.php/view-document.html?gid=2082>

3. Hours of Operation – To help ensure compliance with noise regulations, hours of operation may be limited to 7 a.m. - 10 p.m. Related to this, the A-G, R-S, R-R, and R-1.5 zoning districts should be added to the noise ordinance.
4. Air Monitoring – As discussed above, it may be premature to set local standards specifically for crystalline silica in Winona ambient air. However, the City could emphasize conformance with existing state ambient air regulations for PM 2.5 and PM10, and require that air quality reports submitted to the state be transmitted to the City. This would entail further discussion with the MPCA.

In addition, (as mentioned previously) staff is examining how to designate specific truck routes for each sand facility. These routes would be agreed to and placed on record at City Hall.

It's important to note that the public discourse and the coordination of regulatory approaches to frac sand activities are ongoing. As a result, the next steps discussed above represent only preliminary options for regulatory actions. As the discussion progresses, staff expects to modify such options in order to best suit the needs of the City of Winona.

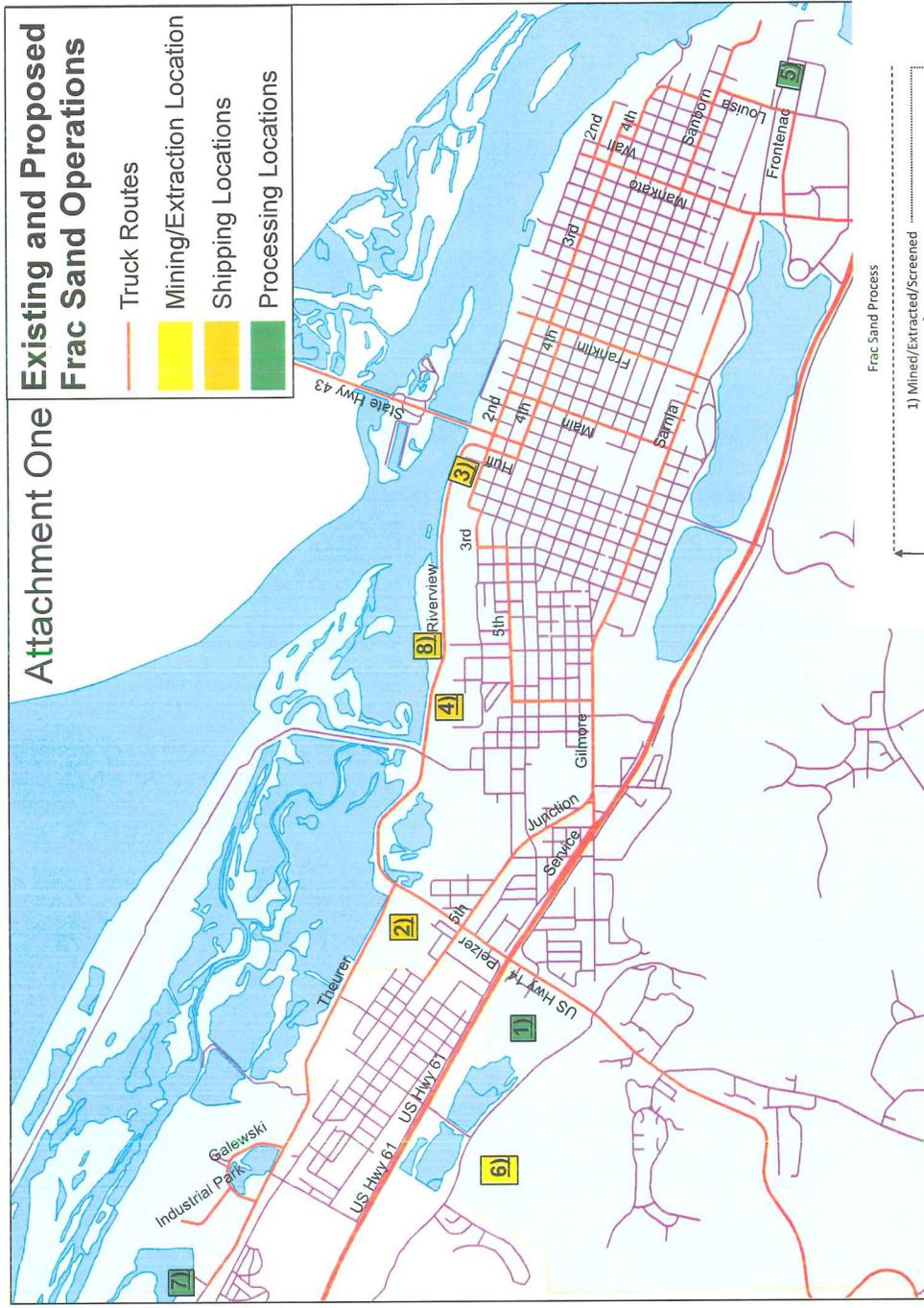
**Attachments:**

- 1) Map: Existing and Proposed Frac Sand Operations in Winona
- 2) Air Quality Report

# Active and Proposed Frac Sand Operations in Winona January 2012

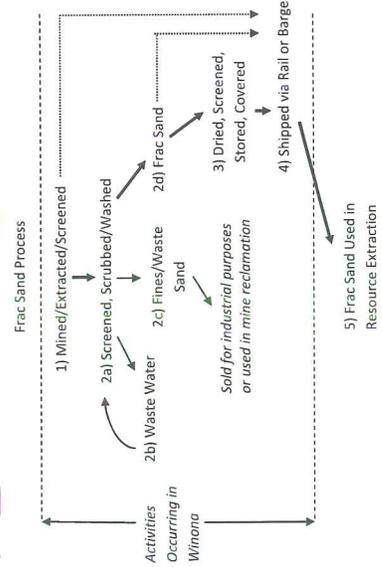
## Numbers Match Locations on Map:

- 1) **Active:** 2100, 2121 Goodview Road  
Company/Individual: Bob Hemker  
Activities Occurring: Scrubbing/washing, then sent to number 4) for shipping  
Zoning: A-G (Agricultural)
- 2) **Proposed:** 25 McConnon Drive  
Company/Individual: Rich Mikrut  
Activities to Occur: Drying, screening, sorting, storage, and shipping via rail  
Zoning: M-2 (General Manufacturing)
- 3) **Active:** 370 West Second Street and Parcel 32-104-0050  
Company/Individual: Steve Kohner  
Activities Occurring: Washed and unwashed sand shipped via rail  
Zoning: M-2 (General Manufacturing)
- 4) **Active:** Property East of 70 Gould Street  
Company/Individual: Rick Mikrut  
Activities Occurring: Washed sand shipped via rail  
Zoning: M-2 (General Manufacturing)
- 5) **Proposed:** 1280-1330 Frontenac Drive  
Company/Individual: Bob Hemker  
Activities to Occur: Scrubbing/washing  
Zoning: M-2 (General Manufacturing)
- 6) **Active:** 4600 Goodview Road/Biesanz Stone Company  
Company/Individual: Biesanz Stone Company  
Activities Occurring: Mining/extraction and screening, then sent to number 7) for washing  
Zoning: A-G (Agricultural)
- 7) **Active:** 6930 West 5<sup>th</sup> St., MN City  
Company/Individual: Steve Kohner  
Activities Occurring: Scrubbing/washing, then sent to number 3) for shipping  
Zoning: N/A
- 8) **Active:** Port Authority Dock  
Company/Individual: Winona Port Authority  
Activities Occurring: Washed or unwashed sand shipped via barge  
Zoning: M-2 (General Manufacturing)



## Attachment One

- Existing and Proposed Frac Sand Operations**
- Truck Routes
  - Mining/Extraction Location
  - Shipping Locations
  - Processing Locations



### Frac Sand Routes into Winona:

- 1) Highway 43/Interstate Bridge
- 2) Highway 61
- 3) Highway 14

### Zoning Regulations for Frac Sand Operations:

- 1) Mining and Extracting - A-G (Agricultural) District with Conditional Use Permit (CUP).
- 2) Processing (Washing/Scrubbing and Drying, Screening, Storing) - M-2 (General Manufacturing) District in accordance with performance standards (noise, dust, etc.)
- M-1 (Light Manufacturing) District provided all processing activities are enclosed and in accordance with performance standards.