

**NONMETALLIC MINING
AIR EMISSIONS
GUIDANCE
FOR
THE DEVELOPMENT
OF THE
1998 AIR EMISSIONS
INVENTORY**

**Nonmetallic Mining Guidance
For The Development Of The 1998 Air Emissions Inventory
Publication #: PUBL-AM-268-98
Publication Date: January 1999
State of Wisconsin
Department of Natural Resources
Bureau of Air Management
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Acknowledgments

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Further Information

If you require further guidance than what is supplied in this document contact your DNR air emission inventory person. DNR establishes one air emission inventory contact per facility in the state. If you do not know who your air contact is, call Ralph Patterson at 608-267-7546, for this information.

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January 15, 1999

IN REPLY REFER TO: 4505

To the owners and operators of nonmetallic mining operations, other than fuel extraction

SUBJECT: Implementation of the Nonmetallic Mining Guidance for the 1998 Air Emissions Inventory

Dear Owners and Operators:

DNR has worked with the nonmetallic mining industry since 1995, to write guidance documents that would facilitate compliance with the state's air emission inventory program. This document is the fourth document in a series and is intended to promote consistency in the administration of the air emission inventory program. This guidance is designed to be as comprehensive as possible and at the same time, simple to use. We welcome your thoughts and comments on how to make a future document as effective and simple in meeting the emission inventory requirements.

The Nonmetallic Mining Guidance For The Development Of The 1998 Air Emissions Inventory is a document similar in content to the guidance document developed for the 1997 air emissions inventory. The 1998 guidance contains much of the same information as the 1997 guidance with a few additions and clarifications.

We noticed during the 1997 reporting year that there was some confusion regarding some aspects of the 1997 guidance document. We added information in this document to address that confusion. Section 5-Changes from the 1997 Nonmetallic Mining Emission Inventory Guidance was added to this document to clarify these issues.

As stated earlier, this is a guidance document. For those owners and operators that choose to rely on this document, DNR is committed to using and following the guidance consistently statewide. For those owners and operators that choose not to follow this guidance, DNR will review the submitted air emission inventory information and determine whether it is an accurate report of a facility's actual air emissions.



This guidance document is supported by the administrator of the Division of Air and Waste Management, the director of the Bureau of Air Management, and the regional Air and Waste Management Leaders.



Jay G. Hochmuth, Administrator
Air and Waste Management
Division

1/15/99
Date Signed



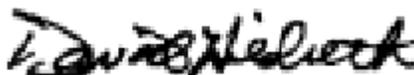
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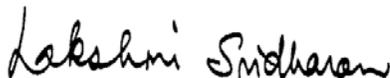
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DNR Disclaimer

This document is intended solely as guidance and does not contain any mandatory requirements except where requirements found in statute or administrative rule are referenced. This guidance does not establish or affect legal rights or obligations and is not finally determinative of any of the issues addressed. This guidance does not create any rights enforceable by any party in litigation with the State of Wisconsin or the Department of Natural Resources. Any regulatory decisions made by the Department of Natural Resources in any matter addressed by this guidance will be made by applying the governing statutes and administrative rules to the relevant facts.

Executive Summary

In August, 1995, representatives from Wisconsin's aggregate producers, the Wisconsin Road Builders Association (WRBA) [now the Wisconsin Transportation Builders Association (WTBA)], and the Aggregate Producers of Wisconsin (APW) met with the DNR's Bureau of Air Management to express concern regarding the calculation of air emissions in the Wisconsin nonmetallic mining industry. The industry expressed concern about the consistency of the calculation of their annual air emissions.

DNR agreed to convene a work group consisting of DNR and industry representatives to review emission inventory issues pertaining to the nonmetallic mining industry. This work group developed three documents^{R1,R2,R3}. The work group disbanded after publication of **What You Need to Know and Do For Determination of 1996 Particulate Emissions In the Crushing Industry**.

The two documents developed by the work group and directed at the calculation of air emissions were different, although they were written at the same time and issued in January 1996. Because the 1995 operational year for the nonmetallic industry was completed at the time the 1995 agreement was finalized, the 1995 agreement addressed only the calculation of air emissions. The 1996 agreement introduced a three tiered structure for identifying control efficiencies for particulate matter sources, the main air pollutant emission for this industry. Pieces of equipment at each crushing spread were assigned control efficiencies based on the amount of dust control at the piece of equipment and the training of on-site personnel. Companies were automatically given a 50% control for each piece of equipment and could request a 75% or greater than 90% control efficiency based on criteria set in the 1996 agreement. Both of these agreements were completed and issued even though some members of the work group members believed that not all issues were properly addressed in the 1996 agreement.

Some weaknesses in the 1996 agreement became apparent in spring 1997. The major weakness was the lack of specificity in the document. While the 1996 agreement addressed air emissions from crushing plants, it did not entirely address the related air emissions from the sites themselves. Because of these weaknesses a reorganized work group was appointed by Ms. Lloyd Eagan, Air Management Bureau Director, in September 1997. The new work group, called the Nonmetallic Mining Air Emissions Work Group (NMAEW), decided to review all aspects of the 1996 agreement and then write a 1997 guidance document. The work group divided into four separate committees to look at particular aspects of the 1996 agreement. Committee 1 reviewed issues concerning a Visible Emissions Reader. Committee 2 reviewed definitional issues. Committee 3 worked on haul road emission factors. Committee 4 identified emission sources for portable and

stationary crushing spreads as well as air emissions associated with the quarry site (e.g. stockpile emissions). The information from these four committees, as well as decisions made by the larger work group in meetings held on September 9, October 2, October 24, and November 14, 1997 were incorporated into the 1997 guidance document.^{R4}

Information added to the 1997 guidance document which was not supplied in the 1996 agreement included tables that supplied the emission factor for each of the criteria pollutants (particulate matter, PM10, sulfur dioxide, carbon monoxide, nitrogen oxides, and volatile organic compounds (also known as reactive organic gasses)).

DNR and the nonmetallic mining industry disagreed as to the applicable version of the reference document, AP-42, to use in the 1997 guidance document. DNR contended that the July, 1994 version of Section 11.19.2 of this document was more technically correct than the January, 1995 version of this AP-42 reference. APW and WTBA contended that the January, 1995 version of this document should be used because it is referenced in NR 438.03(5)(a), Wis. Adm. Code. WTBA and APW agreed to use the July, 1994 AP-42 emission factors for one year and allow the NMAEW to again discuss this disagreement.

The NMAEW met again in July 1998. The disagreement between DNR and APW/WTBA could not be resolved. After internal discussions, DNR agreed, in December 1998, to use the January 1995 AP-42 reference to calculate the emission factors for equipment in the nonmetallic mining industry. Although the DNR still believes that the July, 1994 version of Section 11.19.2 of AP-42 contains a more accurate assessment of particulate matter emissions from nonmetallic mining equipment, DNR has agreed to compromise and use the January, 1995 version of Section 11.19.2 of AP-42, which is the most recent version of that section.

The Nonmetallic Mining Guidance For The Development Of The 1998 Air Emissions Inventory will cover the emissions generated during the 1998 emissions inventory year and subsequent years. The NMAEW will meet to review the implementation of this guidance starting in the spring of 1999, and will develop updated guidance for subsequent years, if necessary.

Table of Contents

DNR Disclaimer.....	v
Executive Summary	vi
Table of Contents.....	viii
Table of Appendices	x
Section 1-Purpose and Organization of Document.....	1
Section 2- Applicable DNR Regulations	1
Reporting Requirements	1
Air Emission Fees.....	2
Timetable.....	2
Section 3-History of Agreements and Guidance	3
1995 and 1996 Agreements	3
1997 Guidance.....	3
1998 Guidance.....	4
Section 4-Nonmetallic Mining Air Emissions Work Group (NMAEW) Membership	4
Section 5-Changes from the 1997 Nonmetallic Mining Emission Inventory Guidance	6
Certification.....	6
Trained Person Changed to On-site Fugitive Dust Observer	6
Typical Crushing Spreads.....	7
Hauling to Crusher Using Loader.....	7
Precipitation Data	8
Tier Control Requirements Clarification.....	8
Appendix K-Example of a Record Keeping Sheet.....	8
Section 6-Length of the Guidance	9
Section 7-Guidance Application.....	9
Section 8- Certification of the Air Emission Inventory and the General Operation Permit.....	9
Section 9-Typical Crushing Spreads.....	10
Section 10-Explanation of Emission Calculations.....	11

Section 11-Control Efficiency Tiers	12
Tier 1-50% Control Efficiency	12
General Requirements	12
Personnel Training Requirements	12
Tier 2-75% Control Efficiency	12
General Requirements	12
Personnel Training Requirements	13
Tier 3-Greater than 90% Control Efficiency	13
General Requirements	13
Personnel Training Requirements	14
Facility Responsibility	14
Section 12-Definitions	15
Section 13-Stationary Source Emissions and Emission Factors.....	19
Particulate Matter	20
PM ₁₀ Emissions	23
SO ₂ , NO _x , CO, ROG emissions	27
Section 14-Compliance With Guidance Document.....	29
Section 15-Dispute Resolution	30
Dispute Resolution-Step 1	30
Dispute Resolution-Step 2	30
Dispute Resolution-Step 3	30
Dispute Resolution-Step 4.....	31
Section 16-References	31

Table of Appendices

- Appendix A AP-42 Section 11.19.2, January, 1995.
- Appendix B AP-42 Section 13.2.2 January 1995.
- Appendix C AP-42 Section 3.3, January 1995.
- Appendix D DNR Form 4500-25, DNR Form 4500-94, COMM Form SBD-6736
- Appendix E Typical Standard Industrial Classification Codes for the 1998 Nonmetallic Mining Air Emissions Guidance
- Appendix F On-site Fugitive Dust Observer Form
- Appendix G Tier Control Requirements
- Appendix H Best Management Practices
- Appendix I Voluntary General Operation Permit Certification Form [Not An Official DNR Form]
- Appendix J Typical Crushing Spread
- Appendix K Example of Record Keeping Sheet

Section 1-Purpose and Organization of Document

The purpose of this document is to identify air emissions from crushing and site operations for the nonmetallic mining industry; promote uniformity and consistency in the calculation of air emissions; and supply guidance to DNR and the nonmetallic mining industry regarding issues specific to the nonmetallic mining industry. The NMAEW sought a comprehensive document to address questions regarding emission sources at a site and an easy-to-use document so that plant operators could refer to one or two pages for necessary information.

This document is comprehensive because it contains a summary of what the NMAEW believes are all the possible emission sources from a quarry site, a stationary crushing plant, or a portable crushing plant. This document also discusses requirements that a company must meet in order to claim specific control efficiencies for their operation.

This document is easy to use because it is essentially two documents in one. The first portion contains extensive information on all aspects of the guidance and the air emissions calculations. The second portion is a series of appendices. Some of the appendices contain information on perforated pages that allow the nonmetallic mining owner or operator to post these pages separately for employee reference at the nonmetallic mining site.

Section 2- Applicable DNR Regulations

Reporting Requirements

Section NR 438.03(1), Wis. Adm. Code, requires, in part, Any person owning or operating a facility which emits an air contaminant in quantities above reporting levels listed in Table 1, except indirect sources of air pollution, to annually submit to the Department an emission inventory report of annual, actual emissions, or, for particulate matter, PM₁₀, sulfur dioxide, nitrogen dioxides, carbon monoxide and volatile organic compounds, throughput information sufficient for the Department to calculate its annual, actual emissions.≡

Generally, a nonmetallic mining operation is required to report air emissions if it emits more than 10,000 pounds of particulate matter, 10,000 pounds of PM₁₀, or 10,000 pounds of nitrogen oxides in a calendar year. The primary source of particulate matter and PM₁₀ emissions originate from rock crushing operations (e.g. primary crushers, secondary crushers, screens, etc.). The primary source of nitrogen oxide emissions

originates from fuel burning operations typically associated with diesel engines and generators.

Air Emission Fees

Sections 285.69, Wis. Stats., and NR 410.04, Wis. Adm. Code, set the fee charged for air emissions. The emission fee for 1998 calendar year emissions is \$33.19 per ton. [Emission fees for subsequent years are calculated based on the increase in the Consumer Price Index in each year.] Any direct source required to obtain an operation permit which emits 5 or more tons of total billable air contaminants per year, is required to pay these emission fees.

Air emission fees are assessed each May based on emissions reported for the previous calendar year. Air emission fees are assessed to portable crushing plants, stationary crushing plants, and permitted quarry sites. Permitted quarry sites are those that produce greater than or equal to 25,000 ton of rock per month on a rolling 12 month average, or actually operate more than 365 days per 5 year period.

Timetable

DNR sends air emission inventory information to over 2,200 facilities annually by the first week of January each year. The facilities have until March 1 of that year to send information back to DNR regarding emissions for the prior calendar year per sec. NR 438.03(1), Wis. Adm. Code.

DNR reviews the submitted information from March to May. The facility receives an emission summary, an emission fee statement (if applicable), and a certification document at approximately the end of May of each year. The emission fee, if applicable, and the certification document must be sent to DNR by the end of June.

Section 3-History of Agreements and Guidance

1995 and 1996 Agreements

In August 1995, as a result of the nonmetallic mining industry's concerns regarding potential disparities in the calculation of particulate emissions at crushing plants statewide, the director of the DNR's Bureau of Air Management established a Crushing Plant Work Group. The work group consisted of industry representatives and DNR air management staff who were familiar with the industry.

The Crushing Plant Work Group conducted numerous meetings from August 1995 to December 1995. From these meetings three documents ^{R1,R2,R3} were completed and issued to producers at the 1996 Mine Safety and Health Administration (MSHA) Annual Round table Meetings.

The 1996 agreement established a three-tiered system to determine particulate matter emission. The first tier set a 50% control efficiency for all pieces of equipment in a crushing spread to which all crushing spreads were entitled. The agreement also set a second tier at 75% control efficiency and a third tier at greater than 90% control efficiency. Each successive tier required better record keeping, more training of crushing plant personnel, and more stringent controls of fugitive dust.

1997 Guidance

Some weaknesses in the 1996 agreement became apparent in spring 1997. The major weakness was the lack of specificity in the document. While the 1996 agreement addressed air emissions from crushing plants, it did not entirely address the calculation of related air emissions from the sites themselves.

Because of these identified weaknesses a reorganized work group, now called the Nonmetallic Mining Air Emissions Work Group (NMAEW), was appointed by Ms. Lloyd Eagan, the Air Management Bureau Director, in September 1997. NMAEW decided to review all aspects of the 1996 agreement and write a 1997 guidance document. The work group divided into four separate committees to review and make improvements to particular aspects of the 1996 agreement. Committee 1 reviewed issues concerning a Visible Emissions Reader. Committee 2 reviewed definitional issues. Committee 3 worked on haul road emission factors. Committee 4 identified emission sources for portable and stationary crushing spreads as well as air emissions associated with the quarry site (e.g. stockpile emissions). The information from these four committees, as well as decisions made by the larger work group in meetings held

on September 9, October 2, October 24, and November 14 were incorporated into that document.

1998 Guidance

The NMAEW reconvened on Tuesday, July 6, 1998 in Madison. Three different committees reported to the main work group. The Training Committee reported that it felt a short training course on the control of fugitive dust was needed in the industry. The Training Committee was instructed to develop a training course. The Criteria Work Group reported that the Tier Criteria in the 1997 guidance document was sufficient and only minor typographical errors in the table in Appendix G needed to be changed. The Record Keeping Work Group decided that an optional form should be included in the next guidance document that clarified what records needed to be kept at a spread to justify the 75% or greater than 90% control tiers. This optional form has been included in Appendix I in this document.

The NMAEW did not reach consensus on the issue that was not resolved in the 1997 guidance document. That issue was the calculation of particulate matter emissions for certain pieces of equipment at the crushing spread. The producers contended that DNR should calculate particulate matter emissions based on information contained in the January 1995 version of AP-42 as prescribed in NR 438.03(5), Wis. Adm. Code. DNR contended the more accurate emission calculation was actually provided by the July, 1994 version of AP-42.^{R6, R7} In December 1998, DNR agreed to use the January, 1995 version of AP-42 to calculate these air emissions. Although the DNR still believed that the July, 1994 version of Section 11.19.2 of AP-42 contained a more accurate assessment of particulate matter emissions from nonmetallic mining equipment, DNR agreed to compromise and use the January, 1995 version of Section 11.19.2 of AP-42, which is the most recent version of that section.

Section 4-Nonmetallic Mining Air Emissions Work Group (NMAEW) Membership

Ms. Lloyd Eagan, Director of the Bureau of Air Management, appointed individuals from the DNR air management program and the nonmetallic mining industry to NMAEW in September, 1997. Interested individuals were also sent information regarding the meetings of this work group. The roster of this work group is as follows:

**Nonmetallic Mining Air Emissions Work Group
1998 Roster**

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<p>Eric Gilbert Cedar Lake Sand and Gravel 5189 Aurora Road Hartford, WI 53027 Telephone Number: 414-644-5125 Fax Number: 414-644-5151 E-Mail: No</p>	<p>Mike Griffin DNR-SER P.O. Box 12436 Milwaukee, WI 53212 Telephone Number: 414-263-8554 Fax Number: 414-263-8716 E-Mail: griffin@dnr.state.wi.us</p>	<p>Tom Halquist Halquist Stone Company, Inc. N52W23564 Lisbon Road Sussex, WI 53089 Telephone Number: 414-246-3561 Fax Number: 414-246-7148 E-Mail: No</p>
<p>Chris Koceja Mann Brothers N6147 Hwy 12 and 67 Elkhorn WI 53121 Telephone Number: 414-723-5500 Fax Number: 414-723-3463 E-Mail: TOPH2NZ@aol.com</p>	<p>Dave Marks Mathy Construction Company P.O. Box 189 Onalaska, WI 54650 Telephone Number: 608-783-6411 Fax Number: 608-783-4311 E-Mail: No</p>	<p>John Melby * DNR-AM/7 P.O. Box 7921 Madison, WI 53707 Telephone Number: 608-264-8884 Fax Number: 608-267-0560 E-Mail: melbyjh@dnr.state.wi.us</p>
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Section 5-Changes from the 1997 Nonmetallic Mining Emission Inventory Guidance

The 1998 emission inventory guidance has not changed significantly from the 1997 nonmetallic mining emission inventory guidance but the document has new additions and added clarification. The more noticeable changes include:

Certification

A section on the difference between certifying the air emission inventory and the producer's compliance with the general operation permit was added to Section 8 of this document. Some people believed that by certifying their air emission inventory in June they were also certifying compliance with their general operation permit in March. They were mistaken and Section 8 has been added to alert producers that they must certify compliance with the general operation permit requirements and the emission inventory emission summary **separately**. Producers may want to consider using the form in Appendix I (Voluntary General Operation Permit Certification Form) to meet this requirement. APW and WTBA have already provided this form to their members statewide, for their **voluntary** use in reporting 1998 activities. This form is included in this guidance document as a courtesy.

Trained Person Changed to On-site Fugitive Dust Observer

Last year, a trained person was mentioned in both the general operation permit and the 1997 emission inventory guidance. The "Trained Person" was defined differently in both documents and led to some confusion. This year, the trained person is still mentioned in the general operation permit. The term "Trained Person" in the 1997 emission inventory guidance was replaced by a "On-Site Fugitive Dust Observer".

At least one person from a company should be trained annually on fugitive dust control techniques. This person would be in charge of training other people at the company. This person can be trained through the review of the APW/WTBA/WAPA/DNR training course that will be available by February 1999. The same person can be trained so that they can function as both the "On-site Fugitive Dust Observer" and the "Visible Emission Reader".

Typical Crushing Spreads

The NMAEW's goal is consistency in air emission inventory reporting. One of the major areas of inconsistency for the 1997 air emission inventory, was the emission producing equipment at a spread reported by a company. Section 9 of this document contains a rule-of-thumb that DNR will use in checking the consistency of crushing spread reporting for 1998 air emissions. DNR acknowledges that every spread is different and has its own unique characteristics. However, each crushing spread, depending on its size, uses a certain number of screens, conveyors, etc. to produce product. If the company reports pieces of equipment that are less than the number and types of equipment identified in Section 9, DNR will contact the company and ask for more information regarding its crushing spread. A schematic drawing of a typical crushing spread is presented in Appendix J of this document.

Hauling to Crusher Using Loader

The emission factors for Hauling to Crusher Using Loader (SCC 30502011) were supplied on page 14 (for PM), page 17 (for PM10), and page 20 (for SO₂, NO_x, CO, ROG) in the 1997 guidance document. This emission factor assumed that the loader was operating on an unpaved road. For the 1998 emission inventory guidance:

1. The Hauling to Crusher Using Loader (SCC 30502011) was changed to Hauling to Crusher Using Loader-Unpaved Roads (SCC 30502011).
2. The Hauling to Crusher Using Loader-Paved Roads (SCC 30502037) was added with the corresponding emission factors for PM, PM10, SO₂, NO_x, CO and ROG.

Visible Emission Reader

In addition to the requirements in Appendix G (this is only a part of the greater than 90% control obligation), a company is required to have only one visible emission reader designated by the company on-staff in order to be eligible for the greater than 90% control tier. (This control tier requirement does not preclude a company from having more than one visible emission reader on-staff.) This person must be certified at least once every twelve months to identify varying levels of visible emissions, using USEPA Method 9 criteria. By certifying only one person for a number of crushing spreads, the company

must realize it is incurring a risk. By having several trained visible emission readers, a company would be more likely to have a visible emission reader available on-site to make sure the 10% opacity limit is not exceeded. If the company elects, the same person at a crushing spread can both be a visible emission reader and a fugitive dust observer.

Precipitation Data

Companies need to keep records on-site regarding precipitation to be eligible for the 75% or greater than 90% control tier. Producers should add the following information to their on-site production sheets to address this requirement:

<u>Type of Suppression</u> (spray bars, climatic, etc.)	<u>Water</u>
	Water In Aggregate _____ (check if applicable) or
	Precipitation _____ (check if applicable) or
	Added water _____ (supply quantity per time)

Tier Control Requirements Clarification

In the 1997 guidance document, the “Tier Control Requirement” table in Appendix G was not specific in regards to when the Trained Person on-site had to be located physically on-site and when visible emissions readings had to be taken while rock was being produced. For the 1998 guidance document, the “Tier Control Requirement” table was modified so that the On-site Fugitive Dust Observer (formerly the Trained Person in the last guidance document) was present while rock was being produced. Also, visible emissions must be recorded once per shift.

Appendix K-Example of a Record Keeping Sheet

Appendix K contains an example of a record keeping sheet that meets the record keeping requirements for the 75% and greater than 90% control tiers.

Section 6-Length of the Guidance

The **Nonmetallic Mining Guidance For The Development Of The 1998 Air Emissions Inventory** will cover the emissions generated beginning in the 1998 emissions inventory year and into the future. The NMAEW will meet to review the implementation of this guidance starting in the spring of 1999, and will develop updated guidance for subsequent years, if necessary.

Section 7-Guidance Application

For purposes of this guidance, nonmetallic mining is a general phrase that includes establishments primarily engaged in mining, quarrying, and processing nonmetallic minerals, except fuels. Current Standard Industrial Classification Codes^{R5} for this industry are listed in Appendix E of this guidance document.

Section 8- Certification of the Air Emission Inventory and the General Operation Permit

Producers are required to certify that they have complied with provisions in their general operation permits the following March 1 after they receive the general operation permits and every March 1 thereafter. Page 8 of the Crushing GOP lists plant-wide requirements for all plants of all sizes. These general operation permit requirements include:

- “(1). Submit a combined report, consisting of an annual summary of monitoring results required by this permit and an annual certification of compliance, to the Department for the time period of January 1 to December 31.
- (2). All deviations from and violations of applicable requirements shall be clearly identified in the monitoring results submittal.
- (3). The certification of compliance shall meet requirements of Part II Section N of this permit and s. NR 439.03(8), Wis. Adm. Code.
- (4). This combined report shall be submitted to Air Management at the Regional address for the Region in which the Permittee Company Headquarters is located. If the company does not have a headquarters located in the state of Wisconsin then these reports shall be submitted to the Bureau of Air Management at: Bureau of Air Management, P.O. Box 7921, Madison, Wisconsin 53707.
- (5). ***The combined report shall be submitted by March 1 after the end of each calendar year. The report shall be postmarked no later than midnight March 1,***

or delivered during normal business hours to any Department office on or before March 1.

- (6). Each report shall be certified by a responsible official as the truth, accuracy, and completeness of the report.”

DNR asks that the producers certify their air emissions when DNR supplies air emission summary information to the company at the end of May. Some producers were confused regarding the emission inventory certification and the certification of compliance with the general operation permit. The producers thought that by certifying their air emission inventory in June that they were also certifying compliance with the general operation permit in March. Unfortunately, this is not true and the producer must certify its compliance with the general operation permit and its emission inventory **separately**. A **voluntary** certification form for the GOP compliance certification is included in Appendix I of this document.

Section 9-Typical Crushing Spreads

One of the goals of the NMAEW was to have consistent reporting of crushing spread emissions across Wisconsin. In order to meet this objective, companies should report all pieces of equipment that emit air pollution. It is apparent from reviewing the 1997 air emissions inventory that producers have different ideas of the number of conveyors, screens, etc. that should be reported as air pollution sources for a crushing spread. In an effort to standardize this reporting the NMAEW has decided to place in this document a description of a “typical crushing spread”. DNR will use the information presented in this section to determine if a producer is correctly characterizing its spread. If the producer is not correctly characterizing their spread, DNR will ask the producer to supply further information. An example of a crushing spread is presented in Appendix J. DNR will use the following rules-of-thumb to determine whether a producer is reporting correctly or should be asked for additional information.

1. Each crushing spread that produces under 50,000 tons of rock per year, may, at a minimum, be comprised of:
 - a. One primary crusher
 - b. Two conveyors
 - c. One loader
 - d. One unpaved haul road
 - e. One storage pile

2. Each crushing operation that produces more than 50,000 tons of rock per year and less than 300,000 tons of rock per year may, at a minimum, be assumed to have:
 - a. One primary crusher
 - b. One secondary crusher
 - c. One screen
 - d. One unpaved haul road
 - e. Four conveyors
 - f. Two storage piles
 - g. One loader

3. Each crushing spread that produces more than 300,000 tons of rock per year may, at a minimum, be assumed to have:
 - a. One primary crusher
 - b. One secondary crusher
 - c. One tertiary crusher
 - d. Three screens
 - e. One loader
 - f. One unpaved haul road
 - g. Six conveyors

Section 10-Explanation of Emission Calculations

The calculation of air emissions from each air emission source for nonmetallic mining involves an activity, an emission factor, and a control efficiency. The air emission equation is:

$$E = A \times EF (1 - CE) \quad \text{where}$$

E= the estimated quantity of emissions generated by the activity

A= the activity producing the emissions

EF= the emission factor (published USEPA information or results of facility specific stack tests)

CE= the control efficiency

The activity is either the amount of stone processed through the piece of equipment, the amount of fuel burned in the equipment, the travel distance in vehicle miles traveled for haul equipment, pounds of explosive materials detonated, or other measured quantity as appropriate. The emission factor estimates the amount of emissions from the activity. For example, one ton of rock processed in a screen without water control will generate 0.015 pound of PM₁₀. The emission factors for each air emission source at a portable plant, stationary plant, or quarry site and are discussed in detail in Section 13 of this document. These numbers or the empirical

equations to develop these numbers are found in the USEPA document which is commonly referred to as AP-42^{R7}.

Section 11-Control Efficiency Tiers

The 1998 nonmetallic mining air emissions guidance sets the control efficiencies at either 50%, 75%, or greater than 90% control for particulate matter depending on dust control at the piece of equipment or site and the training of company personnel. *It is the facility's responsibility to identify the appropriate control efficiency to their DNR air contact.* If necessary, different control efficiencies can be applied to different pieces of equipment at an operation as a result of a number of site specific factors. Control efficiencies defined by the three-tiered system are not applicable to fuel burning emissions. Control credit for these emission sources is supplied to the facility through the results of testing on the piece of fuel burning equipment.

Tier 1-50% Control Efficiency

General Requirements

All processes and operations that generate particulate matter (with the exception of fuel burning equipment) are automatically assigned a 50% control efficiency (Tier 1 Control Efficiency). DNR recognizes that moisture inherent to the climatic conditions present in Wisconsin would allow for some control beyond the uncontrolled (without wet suppression) emission factors published in the applicable AP-42 section. An estimation of 50% control is assigned.

Personnel Training Requirements

There are no personnel training requirements for Tier 1.

Tier 2-75% Control Efficiency

General Requirements

If a facility meets specific housekeeping, record keeping, and control equipment requirements then the facility is entitled to a 75% control efficiency for the process. The 75% control efficiency is used to modify the AP-42 uncontrolled emission factor for the process. The emissions (with the exception of fuel burning equipment) are calculated by

multiplying the plant throughput times the AP-42 uncontrolled emission factor for the process times one minus .75. The 75% control efficiency is achieved by the operator upon demonstration to the DNR air contact that the facility meets the requirements per the table in Appendix G. The table in Appendix G is perforated so that it can be separately posted at the plant site for reference.

Personnel Training Requirements

Under Tier 2, there must be an “On-site Fugitive Dust Observer” as defined in Section 12, on-site during the nonmetallic mining operation or the operation is not eligible for the 75% control efficiency. The on-site fugitive dust observer must participate in a training course developed by DNR in cooperation with the WTBA and APW, or complete another DNR approved training program to recognize when fugitive dust control measures need to be taken, and what measures are appropriate. All on-site fugitive dust observers should complete and sign the table printed on perforated paper in Appendix F. This training should be completed once every year. The perforated table can be removed from this document and used at the plant site for reference or supplied to the DNR air inspector for verification of this training requirement.

Tier 3-Greater than 90% Control Efficiency

General Requirements

If a facility has a Visible Emission Reader assigned to its operation and an “On-site Fugitive Dust Observer”, as defined in Section 12, and it meets specific housekeeping, record keeping, and control equipment requirements, then the facility is entitled to a greater than 90% control efficiency for the process (with the exception of fuel burning equipment). If a $A_{wet} \cong AP-42$ emission factor is available, then this emission factor is assigned to the process without adjustment because the $A_{wet} \cong AP-42$ emission factor is based on actual testing information. If a $A_{wet} \cong AP-42$ emission factor does not exist, then a control efficiency of 91% is assigned to the process and then this control efficiency is used to adjust the AP-42 uncontrolled factor for the process. Please refer to Appendix G in this guidance document for the requirements for greater than 90% control efficiency. The perforated table in this appendix can be removed from this document and can be used at the plant site for reference or supplied to the DNR air inspector for verification.

Personnel Training Requirements

Under Tier 3, the facility must have a certified Visible Emission Reader, as defined in Section 12, assigned to its operation in addition to an “On-site Fugitive Dust Observer”, as defined in Section 12, or the facility is not eligible for greater than 90% control. (Note: The Visible Emission Reader and the On-site Fugitive Dust Observer can be the same person.)

Facility Responsibility

1. Any facility seeking to obtain acknowledgment of greater than 90% control efficiency is required to have an “On-site Fugitive Dust Observer” and at least one person designated by the facility who is certified at least once every twelve months as a Visible Emission Reader.
2. Call the DNR air contact responsible for the plant when a change in control efficiency is desired from a lower control efficiency (50% or 75%). The DNR air contact may visit the site to confirm the facility meets the greater than 90% control criteria.
3. Utilize annual refresher training for plant operators, and include in the training:
 - A. Explanation of opacity
 - B. Discussion of facility equipment and normal and alternative dust control procedures
 - C. View slides/video of proper methods to evaluate opacity.

DNR Air Management Responsibility

The DNR air contact will complete a Facility Contact Report (Form 4500-94) which includes the preliminary indication of the compliance status before the inspector leaves the site.

Section 12-Definitions

The following definitions apply to the terms used in this guidance document. In addition to the definitions in this document, other definitions found in chapters 285, Wis. Stats., and NR 400-499, Wis. Adm. Code, may apply.

Definition Number	Definitional Phrase	Definition
1	AP-42 Emission Factors	AAAP-42 emission factors \cong means the emission factors for crushed stone processing and related operations found in AP-42, Sections 3.3, 11.19, and 13.2, as published by USEPA ^{R7} .
2	Best Management Practices	ABest Management Practices, or BMPs \cong means those activities used to reduce visible fugitive dust emissions. Some examples of BMPs are listed in Appendix H of this guidance
3	Daily suppression activities	ADaily suppression activities \cong means those activities conducted to reduce particulate matter emissions to within allowable levels, during those times when the facility is in operation. These activities include, but are not limited to, watering, shrouding, etc.
4	Frequency of visible emissions reading	AFrequency of visible emissions reading \cong means the number of times during the work shift that visible emissions are to be observed and documented by the on-site fugitive dust observer or the visible emission reader. Note: The on-site fugitive dust observer should be alert to the changes in visible emissions during the entire operation of the crushing plant and document, at least once per shift at the site, an observation for each group of process equipment (crusher, screens, etc.) in a maintenance log maintained at the site.
5	Haul roads	AHaul roads \cong means paved or unpaved roads used to transport product within the site. Note: A distinction is made between haul road emissions assigned to the crusher and those assigned to the site in this guidance document.

6	Haul road controls	<p>AHaul road controls\cong means those activities conducted to reduce particulate matter emissions to within allowable levels during those times when the facility is in operation. These activities include, but are not limited to, application of water, calcium chloride or other approved chemicals, tack coating or paving.</p> <p>Note: DNR will require the documentation of the approximate number of gallons of water or other control agents applied to a haul road for unpaved or paved roads, or the schedule when a street sweeper cleans fugitive dust from the paved road to be maintained on-site. For example, the crushing spread operator could meter the water source, or record the number of times a water truck was filled and estimate the number of gallons of water applied to the haul road, based on that calculation. This document could be kept in the water truck, sweeper or another location on-site.</p> <p>DNR recognizes that under some conditions dust control may not be necessary during or shortly after a precipitation event. DNR suggests using the following scheme to record moisture in a log maintained at the site:</p> <p><u>Type of Suppression</u> (spray bars, climatic, etc.) <u>Water</u> Water In Aggregate _____ (check if applicable) or Precipitation _____ (check if applicable) or Added water _____ (supply quantity per time)</p> <p>DNR anticipates that the recording of precipitation would be a normal procedure implemented by the facility operator at each site.</p>
7	Haul road emission factor	<p>AHaul road emission factor\cong means a three-tiered default factor of 50%, 75%, or greater than 90% total control efficiency for haul roads where the round-trip distance is one mile or less. For haul roads greater than one mile a proportional adjustment can be made to the default emission factor.</p> <p>For example, for a haul road of 2 miles, the emission factor can be calculated by taking the default emission factor and multiplying it by a factor of 2. If the owner or operator so chooses, they can calculate the emission factor through equation 13.2.2 in AP-42. However, to use this equation properly the owner or operator must establish representative vehicle speeds, roadway silt content, etc. for his or her particular operation.</p>

8	Insignificant emissions	AInsignificant emissions≡ means those emissions that will not have an adverse effect on the ambient air quality of the surrounding area and will be reported on the annual emission inventory report, required by section NR 438.03(1), Wis. Adm. Code*, as Azero≡.
9	Nonmetallic mining	ANonmetallic mining≡ has the meaning given in section 295.11, Wis. Stats.**
10	On-site Fugitive Dust Observer	“On-site Fugitive Dust Observer” means someone assigned to the facility that has completed a DNR approved training program to recognize when fugitive dust control measures need to be taken, and to document that appropriate measures were taken. Note: An on-site fugitive dust observer present during nonmetallic mining operations is one of the criteria necessary for the facility to qualify for the 75% and greater than 90% control efficiency tiers.
11	Overburden removal	AOverburden removal≡ means the transport of ground cover necessary to access the on-site nonmetallic mineral deposit. Note: DNR acknowledges that the particulate matter emissions from this operation are related to the transportation of overburden, by haul truck or motor scraper, and not the initial removal or replacement activities themselves. The transportation of overburden will result in insignificant emissions when best management practices are used. Absent the use of best management practices, overburden emissions will have to be reported to DNR.
12	Plant emissions	APlant emissions≡ means those emissions resulting from the following activities: fuel used in generator sets and crushing equipment; shovel and loaders, loading to trucks and/or crushers; haul roads (haul trucks and loaders) to the crushers; grizzlies; feeders and screens; crushers; conveyor transfer points within the crushing spread; and initial deposit at the stockpile.
13	Plant throughput	APlant throughput≡ means the amount of material that effectively travels through the various processes of a crushing plant, measured as stockpile finished product.

***NR 438.03. Required emission inventory reports. (1) REPORTABLE AIR CONTAMINANTS AND LEVELS.** (a) Any person owning or operating a facility which emits an air contaminant in quantities above the reporting levels listed in Table 1, except indirect sources of air pollution, shall annually submit to the department an emission inventory report of annual, actual emissions or, for particulate matter, PM₁₀, sulfur dioxide, nitrogen oxides, carbon monoxide, volatile organic compounds, throughput information sufficient for the department to calculate its annual, actual emissions.

****295.11(3), Stats.** ANonmetallic mining≡ means all of the following:

- (a) Operations or activities for the extraction from the earth for sale or use by the operator of mineral aggregates or nonmetallic minerals such as stone, sand, gravel, asbestos, beryl, clay, feldspar, peat, talc and topsoil, including such operations or activities as excavation, grading, and dredging.
- (b) On-site processes that are related to the extraction of mineral aggregates or nonmetallic minerals, such as stockpiling of materials, blending mineral aggregates or nonmetallic minerals with other mineral aggregates or nonmetallic minerals, crushing, screening, scalping, and dewatering.

14	Precipitation event	<p>APrecipitation event≡ means that meteorological conditions were such, that at least 0.01 inches of precipitation (water equivalent) occurs during a 24-hour period.</p> <p>Note: A notation should be made in the on-site log maintained at the facility, when such precipitation occurred. DNR suggests using the following scheme to record the precipitation event:</p> <p><u>Type of Suppression</u> (spray bars, climatic, etc.) <u>Water</u> Water In Aggregate _____ (check if applicable) or Precipitation _____ (check if applicable) or Added water _____ (supply quantity per time)</p>
15	Process throughput	<p>AProcess throughput≡ means the amount of material that effectively travels through a specific process at a crushing plant.</p>
16	Reactive Organic Gases (ROG)	<p>The organic gasses emitted into the atmosphere are comprised of reactive and non-reactive organic gasses. The non-reactive organic gasses, such as chlorofluorocarbons, do not react the surrounding air and are not responsible for secondary chemical reactions that cause ozone. DNR has differentiated between reactive organic gasses (ROG) and non-Reactive Organic Gasses (NROG) since the passage of the 1990 Clean Air Act Amendments for purposes of reporting air emissions to USEPA. For the nonmetallic mining industry, ROGs are equivalent to volatile organic compounds because this industry does not emit NROGs.</p>
17	Site emissions	<p>ASite emissions≡ means those emissions resulting from the following activities: overburden removal; drilling and blasting; material handling at the storage piles; reclamation piles; haul roads (paved and unpaved) used for product transfer or distribution; and stockpile emissions, after the initial deposit at the stockpile.</p>
18	Source Classification Code (SCC)	<p>ASource Classification Code, or (SCC)≡ means an 8-digit code which represents a process or function associated with a point of air contaminant emissions.</p>
19	Standard Industrial Classification (SIC)	<p>AStandard Industrial Classification or (SIC) Code≡ means a 4-digit code which is assigned to an establishment on the basis of its primary activity, which is determined by its principal product or group of products produced or distributed, or services rendered.</p>
20	Visible emissions	<p>AVisible emissions≡ means those emissions as identified by USEPA Method 9.</p>
21	Visible emission reader	<p>AVisible emission reader≡ means the person designated by the facility who has been certified at least once in twelve months to identify varying levels of visible emissions, using USEPA Method 9 criteria.</p> <p>Note: A Visible Emission Reader, assigned to the facility, is one of the criteria necessary for the facility to qualify for the greater than 90% control efficiency. Care should be taken to not confuse this requirement for the 1998 Nonmetallic Mining Air Emissions Guidance with the requirements of New Source Performance Standards (NSPS) Subpart 000.</p>

Section 13-Stationary Source Emissions and Emission Factors

Nonmetallic mining air emissions can be generated by portable crushing equipment, stationary crushing equipment, or the quarry site. This section identifies the source of particulate matter, PM₁₀, nitrogen oxide, carbon monoxide, and reactive organic gas (also known as volatile organic compound) emissions. All four tables note which emissions are applicable according to the following legend. The emissions factors are applicable according to the following codes:

1. **Q** Quarry Site
2. **G** Gravel Pit Site
3. **S** Screening
4. **C** Crusher

Particulate Matter ¹

Process Name	SCC	Quarry Site (Q), Gravel Pit (G) Screening Operation (S) Crusher (C)	Resulting Default Emission Factor at 50% control	Resulting Default Emission Factor at 75% control	Resulting Default Emission Factor at greater than 90% control	Comments
Primary Crushing	30502001	C	0.00035 lb PM/ton of process throughput	0.000175 lb PM/ton of process throughput	0.000063 lb PM/ton of process throughput	
Crusher Fuel Use	20200102	C	42.4 lb PM/1000 gal #2 fuel oil	42.4 lb PM/1000 gal #2 fuel oil	42.4 lb PM/1000 gal #2 fuel	Refer to AP-42 Section 3.3, if other fuel burned
Loading Grizzly	30502013	S, C	0.000008 lb PM/ton of process throughput	0.000004 lb PM/ton of process throughput	0.00000144 lb PM/ton of process throughput	Insignificant Particulate Matter emission
Secondary Crushing	30502002	C	0.00252 lb PM/ton of process throughput	0.00126 lb PM/ton of process throughput	0.001239 lb PM/ton of process throughput	Has wet suppression emission factor
Tertiary Crushing	30502003	C	0.00252 lb PM/ton of process throughput	0.00126 lb PM/ton of process throughput	0.001239 lb PM/ton of process throughput	Has wet suppression emission factor
Fines Crushing	30502005	C	0.01575 lb PM/ton of process throughput	0.007875 lb PM/ton of process throughput	0.0042 lb PM/ton of process throughput	Has wet suppression emission factor
Screening (with the exception of fines screening)	30502004, 30502013, 30502014, 30502015, 30502016	S, C	0.01575 lb PM/ton of process throughput	0.007875 lb PM/ton of process throughput	0.001764 lb PM/ton of process throughput	Has wet suppression emission factor
Fines Screening	30502021	S, C	0.07455 lb PM/ton of process throughput	0.037275 lb PM/ton of process throughput	0.00441 lb PM/ton of process throughput	Has wet suppression emission factor
Conveying Transfer Points	30502006	S, C	0.00147 lb PM//ton of process throughput	0.000735 lb PM/ton of process throughput	0.0001004 lb PM/ton of process throughput	Has wet suppression emission factor
Blasting	30502009	Q, C	None	None	None	
Drilling	30502010	Q, C	0.000084 lb PM/ton of process throughput	0.000042 lb PM/ton of process throughput	0.00001512 lb PM/ton of process throughput	Insignificant Particulate Matter Emission

¹ The PM emission factors were developed from Section 11.19.2 of the January, 1995 version of AP-42.

Process Name	SCC	Quarry Site (Q), Gravel Pit (G) Screening Operation (S) Crusher (C)	Resulting Default Emission Factor at 50% control	Resulting Default Emission Factor at 75% control	Resulting Default Emission Factor at greater than 90% control	Comments
Drilling fuel use	20200301, 20200102	Q, C	42.4 lb PM/ 1000 gal #2 fuel oil	42.4 lb PM/1000 gal #2 fuel oil	42.4 lb PM/1000 gal #2 fuel oil	Refer to AP-42 Section 3.3 if other fuel used
Truck loading by conveyor	30502032	Q, C	0.000105 lb PM/ton of rock loaded	0.0000525 lb PM/ton of rock loaded	0.0000189 lb PM/ton of rock loaded	Insignificant Particulate Matter Emission
Truck unloading: fragmented stone	30502031	Q, C	0.0000168 lb PM/ton of rock unloaded	0.0000084 lb PM/ton of rock unloaded	0.000003024 lb PM/ton of rock unloaded	Insignificant Particulate Matter Emission
Hauling to crusher using loader-unpaved haul roads	30502011	C	2.6185 lb PM/ vehicle mile travelled or 0.01376 lb PM/ton of process throughput	0.8788 lb PM/ vehicle miles travelled or 0.0046 lb PM/ton of process throughput	0.02357 lb PM/ vehicle miles travelled or 0.0012 lb PM/ton of process throughput	Default values valid only for back and forth trip length at or below 0.047 mile (250 feet). For trip length greater than 0.047 mile(250 feet) multiply the default factor by the trip length or calculate emission based on equation 13.2.2(1) in AP-42.
Hauling to crusher using loader-paved haul roads	30502037	C	0.8367 lb PM/ vehicle mile travelled or 0.00437 lb PM/ton of process throughput	0.4184 lb PM/ vehicle miles travelled or 0.002185 lb PM/ton of process throughput	0.1506 lb PM/ vehicle miles travelled or 0.000787 lb PM/ton of process throughput	Default values valid only for back and forth trip length at or below 0.047 mile (250 feet). For trip length greater than 0.047 mile(250 feet) multiply the default factor by the trip length or calculate emission based on equation 13.2.2(1) in AP-42.
Haul truck traffic on unpaved haul roads	30502033 (SCC proposed)	Q, G, C	4.695 lb PM/ vehicle mile travelled or 0.247 lb PM/ton of process throughput	1.576 lb PM/ vehicle mile travelled or 0.083 lb PM/ton of process throughput	0.423 lb PM/vehicle mile travelled or 0.0223 lb PM/ton of process throughput	Default values valid only for back and forth trip length at or below 1 mile. For trip length greater than 1 mile multiply the default factor by the trip length or calculate emission based on equation 13.2.2(1) in AP- 42.

Process Name	SCC	Quarry Site (Q), Gravel Pit (G) Screening Operation (S) Crusher (C)	Resulting Default Emission Factor at 50% control	Resulting Default Emission Factor at 75% control	Resulting Default Emission Factor at greater than 90% control	Comments
Haul truck traffic on paved haul roads	30502034 (SCC proposed)	Q, G, C	2.25 lb PM/vehicle miles travelled or 0.1184 PM/ton of process throughput	1.125 lb PM/vehicle miles travelled or 0.0592 lb PM/ton of process throughput	0.405 lb PM/vehicle miles travelled or 0.00213 lb PM/ton of process throughput	Default values valid only for back and forth trip length at or below 1 mile. For trip length greater than 1 mile multiply the default factor by the trip length or calculate emission based on equation 13.2.2(1) in AP-42.
Mine truck traffic on unpaved haul roads	30502035 (SCC proposed)	Q, G, C	8.474 lb PM/vehicle miles travelled or 0.1599 lb PM/ton of process throughput	2.844 lb PM/vehicle miles travelled or 0.054 lb PM/ton of process throughput	0.763 lb PM/vehicle miles travelled or 0.0144 lb PM/ton of process throughput	Default values valid only for back and forth trip length at or below 1 mile. For trip length greater than 1 mile multiply the default factor by the trip length or calculate emission based on equation 13.2.2(1) in AP-42.
Stockpiles fed by unloading trucks	30502007	Q, G, C	0.0074 lb PM/ton of process throughput	0.0037 lb PM/ton of process throughput	0.0015 lb PM/ton of process throughput	
Stockpile operations for stockpiles fed by conveyors	30502042 (SCC proposed)	Q, G, C	0.003681 lb PM/ton of process throughput	0.00184 lb PM/ton of process throughput	0.000663 lb PM/ton of process throughput	Has a wet suppression emission factor
Stockpile wind erosion	30502043 (SCC proposed)	Q, G, C	Calculate emissions using equations in Section 13.2.4 of AP-42 when emissions are visible.	Calculate emissions using equations in Section 13.2.4 of AP-42 when emissions are visible..	Calculate emissions using equations in Section 13.2.4 of AP-42 when emissions are visible.	If there are no visible emissions, then emissions are insignificant.
Overburden removal	30502051 (SCC proposed)	Q, G, C	Same as Haul truck traffic on unpaved haul roads unless best management practices applied	Same as Haul truck traffic on unpaved haul roads unless best management practices applied	Same as Haul truck traffic on unpaved haul roads unless best management practices applied	Emissions are insignificant when best management practices are used.

*PM₁₀ Emissions*¹

Process Name	SCC	Quarry Site (Q), Gravel Pit (G) Screening Operation (S) Crusher (C)	Resulting Default Emission Factor at 50% control	Resulting Default Emission Factor at 75% control	Resulting Default Emission Factor at greater than 90% control	Comments
Primary Crushing	30502001	C	0.00035 lb PM ₁₀ /ton of process throughput	0.000175 lb PM ₁₀ /ton of process throughput	0.000063 lb PM ₁₀ /ton of process throughput	
Crusher Fuel Use	20200102	C	42.4 lb PM ₁₀ /1000 gal #2 fuel oil	42.4 lb PM ₁₀ /1000 gal #2 fuel oil	42.4 lb PM ₁₀ /1000 gal #2 fuel	Refer to AP-42 Section 3.3 if other fuel burned
Loading Grizzly	30502013	S, C	0.000008 lb PM ₁₀ /ton of process throughput	0.000004 lb PM ₁₀ /ton of process throughput	0.00000144 lb PM ₁₀ /ton of process throughput	Insignificant Particulate Matter Emission
Secondary Crushing	30502002	C	0.0012 lb PM ₁₀ /ton of process throughput	0.0006 lb PM ₁₀ /ton of process throughput	0.00059 lb PM ₁₀ /ton of process throughput	Has wet suppression emission factor
Tertiary Crushing	30502003	C	0.0012 lb PM ₁₀ /ton of process throughput	0.0006 lb PM ₁₀ /ton of process throughput	0.00059 lb PM ₁₀ /ton of process throughput	Has wet suppression emission factor
Fines Crushing	30502005	C	0.0075 lb PM ₁₀ /ton of process throughput	0.00375 lb PM ₁₀ /ton of process throughput	0.0020 lb PM ₁₀ /ton of process throughput	Has wet suppression emission factor
Screening (with the exception of fines screening)	30502004, 30502014, 30502015, 30502016	S, C	0.0075 lb PM ₁₀ /ton of process throughput	0.00375 lb PM ₁₀ /ton of process throughput	0.00084 lb PM ₁₀ /ton of process throughput	Has wet suppression emission factor
Fines Screening	30502021	S, C	0.0355 lb PM ₁₀ /ton of process throughput	0.01775 lb PM ₁₀ /ton of process throughput	0.0021 lb PM ₁₀ /ton of process throughput	Has wet suppression emission factor
Conveying Transfer Points	30502006	S, C	0.0007 lb PM ₁₀ /ton of process throughput	0.00035 lb PM ₁₀ /ton of process throughput	0.000048 lb PM ₁₀ /ton of process throughput	Has wet suppression emission factor
Blasting	30502009	Q, C	None	None	None	
Drilling	30502010	Q, C	0.00004 lb PM ₁₀ /ton of process throughput	0.00002 lb PM ₁₀ /ton of process throughput	0.0000072 lb PM ₁₀ /ton of process throughput	Insignificant Particulate Matter Emission
Drilling fuel use	20200301, 20200102	Q, C	42.4 lb PM ₁₀ / 1000 gal #2 fuel oil	42.4 lb PM ₁₀ /1000 gal #2 fuel oil	42.4 lb PM ₁₀ /1000 gal #2 fuel oil	Refer to AP-42 Section 3.3 if other fuel burned

¹The PM₁₀ emission factors were developed from Section 11.19.2 of the January, 1995 version of AP-42.

Process Name	SCC	Quarry Site (Q), Gravel Pit (G) Screening Operation (S) Crusher (C)	Resulting Default Emission Factor at 50% control	Resulting Default Emission Factor at 75% control	Resulting Default Emission Factor at greater than 90% control	Comments
Truck loading by conveyor	30502032	Q, C	0.00005 lb PM ₁₀ /ton of rock loaded	0.000025 lb PM ₁₀ /ton of rock loaded	0.000009 lb PM ₁₀ /ton of rock loaded	Insignificant Particulate Matter Emission
Truck unloading; fragmented stone	30502031	Q, C	0.000008 lb PM ₁₀ /ton of rock unloaded	0.000004 lb PM ₁₀ /ton of rock unloaded	0.00000144 lb PM ₁₀ /ton of rock unloaded	Insignificant Particulate Matter Emission
Hauling to crusher using loader-unpaved haul roads	30502011	C	0.9425 lb PM ₁₀ / vehicle mile travelled or 0.00495 lb PM ₁₀ /ton of process throughput	0.3160 lb PM ₁₀ / vehicle mile travelled or 0.00166 lb PM ₁₀ /ton of process throughput	0.0848 lb PM ₁₀ / vehicle mile travelled or 0.00045 lb PM ₁₀ /ton of process throughput	Default values valid only for back and forth trip length at or below 0.047 mile (250 feet). For trip length greater than 0.047 mile(250 feet) multiply the default factor by the trip length or calculate emission based on equation 13.2.2(1) in AP-42.
Hauling to crusher using loader-paved haul roads	30502037	C	0.1633 lb PM ₁₀ / vehicle mile travelled or 0.0009 lb PM ₁₀ /ton of process throughput	0.0816 lb PM ₁₀ / vehicle mile travelled or 0.0004 lb PM ₁₀ /ton of process throughput	0.0294 lb PM ₁₀ / vehicle mile travelled or 0.0002 lb PM ₁₀ /ton of process throughput	Default values valid only for back and forth trip length at or below 0.047 mile (250 feet). For trip length greater than 0.047 mile(250 feet) multiply the default factor by the trip length or calculate emission based on equation 13.2.2(1) in AP-42.

Process Name	SCC	Quarry Site (Q), Gravel Pit (G) Screening Operation (S) Crusher (C)	Resulting Default Emission Factor at 50% control	Resulting Default Emission Factor at 75% control	Resulting Default Emission Factor at greater than 90% control	Comments
Haul truck traffic on unpaved haul roads	30502033 (SCC proposed)	Q, G, C	1.692 lb PM ₁₀ / vehicle mile travelled or 0.089 lb PM ₁₀ /ton of process throughput	0.568 lb PM ₁₀ / vehicle mile travelled or 0.0299 lb PM ₁₀ /ton of process throughput	0.152 lb PM ₁₀ / vehicle mile travelled or 0.008 lb PM ₁₀ /ton of process throughput	Default values valid only for back and forth trip length at or below 1 mile. For trip length greater than 1 mile multiply the default factor by the trip length or calculate emission based on equation 13.2.2(1) in AP-42.
Haul truck traffic on paved haul roads	30502034 (SCC proposed)	Q, G, C	0.439 lb PM ₁₀ / vehicle mile travelled or 0.0231 lb PM ₁₀ /ton of process throughput	0.219 lb PM ₁₀ / vehicle mile travelled or 0.0115 lb PM ₁₀ /ton of process throughput	0.079 lb PM ₁₀ / vehicle mile travelled or 0.0042 lb PM ₁₀ /ton of process throughput	Default values valid only for back and forth trip length at or below 1 mile. For trip length greater than 1 mile multiply the default factor by the trip length or calculate emission based on equation 13.2.2(1) in AP-42.
Mine truck traffic on unpaved haul roads	30502035 (SCC proposed)	Q, G, C	3.05 lb PM ₁₀ / vehicle mile travelled or 0.058 lb PM ₁₀ /ton of process throughput	1.024 lb PM ₁₀ / vehicle mile travelled or 0.0193 lb PM ₁₀ /ton of process throughput	0.2745 lb PM ₁₀ / vehicle mile travelled or 0.00518 lb PM ₁₀ /ton of process throughput	Default values valid only for back and forth trip length at or below 1 mile. For trip length greater than 1 mile multiply the default factor by the trip length or calculate emission based on equation 13.2.2(1) in AP-42.
Stockpiles fed by unloading trucks	30502007	Q, G, C	0.00174 lb PM ₁₀ /ton of process throughput	0.00087 lb PM ₁₀ /ton of process throughput	0.000313 lb PM ₁₀ /ton of process throughput	
Stockpile operations for stockpiles fed by conveyors	30502042 (SCC proposed)	Q, G, C	0.0024 lb PM ₁₀ /ton of process throughput	0.0012 lb PM ₁₀ /ton of process throughput	0.0004 lb PM ₁₀ /ton of process throughput	Has a wet suppression emission factor

Process Name	SCC	Quarry Site (Q), Gravel Pit (G) Screening Operation (S) Crusher (C)	Resulting Default Emission Factor at 50% control	Resulting Default Emission Factor at 75% control	Resulting Default Emission Factor at greater than 90% control	Comments
Stockpile wind erosion	30502043 (SCC proposed)	Q, G, C	Calculate emissions using equations in Section 13.2.4 of AP-42 when emissions are visible.	Calculate emissions using equations in Section 13.2.4 of AP-42 when emissions are visible.	Calculate emissions using equations in Section 13.2.4 of AP-42 when emissions are visible.	If there are no visible emissions, then emissions are insignificant.
Overburden removal	30502051 (SCC proposed)	Q, G, C	Same as Haul truck traffic on unpaved haul roads unless best management practices applied	Same as Haul truck traffic on unpaved haul roads unless best management practices applied	Same as Haul truck traffic on unpaved haul roads unless best management practices applied	Emissions are insignificant when best management practices are used.

SO₂, NO_x, CO, ROG emissions ¹

Process Name	SCC	Quarry Site (Q), Gravel Pit (G) Screening Operation (S) Crusher (C)	SO ₂ Emission Factor	NO _x emission factor	CO emission factor	ROG emission factor
Primary Crushing	30502001	C	Not Applicable	Not Applicable	Not Applicable	Not Applicable
Crusher Fuel Use	20200301, 20200102	C	39.7 lb SO ₂ /1000 gal #2 fuel oil	604 lb NO _x /1000 gal #2 fuel oil	130 lb CO/1000 gal #2 fuel	49.3 lb ROG/1000 gal #2 fuel
Loading Grizzly	30502013	S, C	Not Applicable	Not Applicable	Not Applicable	Not Applicable
Secondary Crushing	30502002	C	Not Applicable	Not Applicable	Not Applicable	Not Applicable
Tertiary Crushing	30502003	C	Not Applicable	Not Applicable	Not Applicable	Not Applicable
Fines Crushing	30502005	C	Not Applicable	Not Applicable	Not Applicable	Not Applicable
Screening (with the exception of fines screening)	30502004, 30502013, 30502014, 30502015, 30502016	S, C	Not Applicable	Not Applicable	Not Applicable	Not Applicable
Fines Screening	30502021	S, C	Not Applicable	Not Applicable	Not Applicable	Not Applicable
Conveying Transfer Points	30502008	S, C	Not Applicable	Not Applicable	Not Applicable	Not Applicable
Blasting	30502009	Q, C	2 lb SO ₂ /ton ANFO (only needs to be reported by the blaster after specific request from DNR)	17 lb NO _x /ton ANFO (only needs to be reported by the blaster after specific request from DNR)	67 lb CO/ton ANFO (only needs to be reported by the blaster after specific request from DNR)	None
Drilling	30502010	Q, C	Not Applicable	Not Applicable	Not Applicable	Not Applicable
Drilling fuel use	20200301, 20200102	Q, C	39.7 lb SO ₂ / 1000 gal #2 fuel oil	604 lb NO _x /1000 gal #2 fuel oil	130 lb CO/1000 gal #2 fuel oil	49.3 lb ROG/1000 gal #2 fuel oil
Truck loading by conveyor	30502032	Q, C	Not Applicable	Not Applicable	Not Applicable	Not Applicable

¹Fuel use emission factors developed from Section 3.3 of the January, 1995 version of AP-42. Blasting emission factors developed from Section 13.3.1 of the January, 1995 version of AP-42.

Process Name	SCC	Quarry Site (Q), Gravel Pit (G) Screening Operation (S) Crusher (C)	Resulting Default Emission Factor at 50% control	Resulting Default Emission Factor at 75% control	Resulting Default Emission Factor at greater than 90% control	Comments
Truck unloading: fragmented stone	30502031	Q, C	Not Applicable	Not Applicable	Not Applicable	Not Applicable
Hauling to crusher using loader-unpaved roads	30502011	C	Not Applicable	Not Applicable	Not Applicable	Not Applicable
Hauling to crusher using loader-paved roads	30502037	C	Not Applicable	Not Applicable	Not Applicable	Not Applicable
Haul truck traffic on unpaved haul roads	30502033 (SCC proposed)	Q, G, C	Not Applicable	Not Applicable	Not Applicable	Not Applicable
Haul truck traffic on paved haul roads	30502034 (SCC proposed)	Q, G, C	Not Applicable	Not Applicable	Not Applicable	Not Applicable
Mine truck traffic on unpaved haul roads	30502035 (SCC proposed)	Q, G, C	Not Applicable	Not Applicable	Not Applicable	Not Applicable
Stockpiles fed by unloading trucks	30502007	Q, G, C	Not Applicable	Not Applicable	Not Applicable	Not Applicable
Stockpile operations for stockpiles fed by conveyors	30502042 (SCC proposed)	Q, G, C	Not Applicable	Not Applicable	Not Applicable	Not Applicable
Stockpile wind erosion	30502043 (SCC proposed)	Q, G, C	Not Applicable	Not Applicable	Not Applicable	Not Applicable
Overburden removal	30502051 (SCC proposed)	Q, G, C	Not Applicable	Not Applicable	Not Applicable	Not Applicable

Section 14-Compliance With Guidance Document

DNR=s action if the site or crusher did not meet the 75% or greater than 90% control requirements

The DNR air contact shall provide the plant operator a list of alleged deficiencies by emission point for which the plant did not meet the 75% or greater than 90% control efficiency requirements. The DNR air contact shall indicate the applicable control efficiency (50% or 75%) now assigned to the plant.

Follow-up when DNR air contact has determined that the site or crusher did not meet the 75% or greater than 90% control requirements

If the facility fails to address and resolve the alleged deficiencies identified by a DNR air contact, the new control efficiency (50% or 75%) will be assigned for the entire calendar year for the emission point. DNR will continue to use the new control efficiency for the emission point until the alleged deficiencies are resolved.

If the facility chooses to address the alleged deficiencies, the facility shall:

1. Make necessary changes to address the alleged deficiencies.
2. Contact the DNR air contact to report the corrective actions. The DNR air contact has the option of either accepting the facility=s report, requiring a written report, or conducting a follow-up visit.
3. If the DNR air contact is satisfied that the facility meets the greater than 90% control efficiency requirements, the DNR air contact will pro-rate the annual assigned control efficiency based on a composite of control efficiencies observed. DNR will reassign the 90% control efficiency to the plant for the start of the next calendar year.

Subsequent actions when the DNR air contact has determined that the site or crusher has not resolved the previously identified deficiencies and the facility did not meet the 75% or greater than 90% control requirements

If the facility has not resolved the alleged deficiencies and the DNR air contact=s follow-up site visit finds remaining alleged deficiencies, the DNR air contact will notify a representative of the owner or operator of their findings before the DNR air contact leaves the site. DNR will continue to assign the applicable control efficiency (50% or 75%) to the plant. DNR will assign the applicable control efficiency (50% or 75%) to the start of the next calendar year.

Section 15-Dispute Resolution

If a facility has concerns regarding the calculation of their emissions and the subsequent emission fee assessment the NMAEW advises following a four step process toward resolving the disputed emissions. This four step process starts with an informal process and moves to the more formal process.

Dispute Resolution-Step 1

Contact the DNR air contact and seek resolution.

Dispute Resolution-Step 2

The facility can submit an informal written explanation of the dispute and a justification for the requested control efficiency to the Regional Air and Waste Leader at the appropriate region with a carbon copy to the Small Business Section Chief at the Bureau of Air Management, P.O. Box 7921, Madison, WI 53707, before May 31 for the preceding year. The DNR will review the request and provide a written response within 30 days.

Dispute Resolution-Step 3

If the facility cannot resolve its disputed emission inventory or fees with the DNR contact person, then the facility should use the dispute mechanisms in section NR 438.03(6), Wis. Adm. Code, (for emissions calculations) or section NR 410.04(6), Wis. Adm. Code, (for emission fee calculations). The facility must send a letter to their DNR air contact detailing the dispute. Within 14 calendar days of receipt of the letter, the DNR will supply the facility with information used to calculate the emissions or the emission fee in question. If, after DNR responds, the facility is still not satisfied with the emission calculations or explanation of the emission fee, then the facility has 14 calendar days after receipt of DNR=s letter to send further information to dispute either the emission calculation or the emission fee. After the DNR receives this letter, the DNR sends a decision back to the facility on whether the DNR agrees that the emission calculations or fees should be adjusted.

Dispute Resolution-Step 4

If the facility disagrees with DNR=s decision in Step 3, the facility can use the appeal mechanisms in state statutes to pursue adjustment of the emission calculations or emission fees.

Section 16-References

- R1. **1995 Particulate Emissions in the Crushing Industry**, DNR, January 1996.
- R2. **New Source Performance Standards (NSPS) in the Crushing Industry**, DNR, January, 1996.
- R3. **What You Need to Know and Do For Determination of 1996 Particulate Emissions In the Crushing Industry**, DNR, January 1996.
- R4. **Nonmetallic Mining Air Emissions Guidance For The Development Of The 1997 Air Emissions Inventory**, DNR, December, 1997.
- R5. **Standard Industrial Classification Manual**, Executive Office of the President, Office of Management and Budget, 1987. NTIS Order Number. PB 87-10012
- R6. **Compilation of Air Pollutant Emission Factors, Volume 1: Stationary Point And Area Sources**, USEPA-OAQPS, July, 1994. USEPA Document Number: AP-42.
- R7. **Compilation of Air Pollutant Emission Factors, Volume 1: Stationary Point And Area Sources, Fifth Edition**, USEPA-OAQPS, January, 1995. USEPA Document Number: AP-42.

Appendix A

**AP-42 Section 11.19.2
January 1995**

Appendix B

**AP-42 Section 13.2.2
January 1995**

Appendix C

AP-42 Section 3.3
January 1995

Appendix D

**DNR Form 4500-25
Portable Source Relocation Notification**

**DNR Form 4500-94
Entity Contact Report Form**

**COMM Form SBD-6736
Notice To Begin Operation**

Appendix E

Typical Standard Industrial Classification Codes

For the 1998 Nonmetallic Mining Air Emissions Guidance

Typical Standard Industrial Classification Code Groups

The following is a listing of the Major Group numbers for establishments typically engaged in nonmetallic mining, taken from the Standard Industrial Classification Manual, 1987 edition.

Standard Industrial Classification Group	Standard Industrial Classification Group Description
Major Group 14	Mining and quarrying of nonmetallic minerals, except fuels
Major Group 16	Heavy construction other than building construction-contractors
Major Group 29	Petroleum refining and related industries
Major Group 32	Stone, clay, glass, and concrete products

Appendix F

On-site Fugitive Dust Observer Form

Appendix G

Tier Control Requirements

Tier Control Requirements^a

Process	50% Control ^b Dry Factors	75% Control Dry Factors	greater than 90% Control ^c Wet Factors
Screening, Primary Crushing, Secondary Crushing, Tertiary Crushing Fines Crushing, loading grizzly,	Document yearly throughput.	<ol style="list-style-type: none"> 1. Document yearly throughput. 2. Document daily suppression activities and/or meteorological conditions.^d 3. On-site Fugitive Dust Observer located with crushing spread during hours that crushing spread operates. 	<ol style="list-style-type: none"> 1. Document yearly throughput. 2. Document daily suppression activities and/or meteorological conditions.^d 3. On-site Fugitive Dust Observer located at crushing site during hours that crushing spread operates. 4. At least one Visible Emission Reader on staff. 5. Document visible emissions at or below 10% once per 8 hour shift at site.
Conveyor Transfer Points	<ol style="list-style-type: none"> 1. Document yearly throughput. 2. Minimize drop height. 	<ol style="list-style-type: none"> 1. Document yearly throughput. 2. Document daily suppression activities and/or meteorological conditions.^d 3. Maintain suppressive equipment in operating condition. 4. On-site Fugitive Dust Observer located with crushing spread during hours that crusher spread operates. 	<ol style="list-style-type: none"> 1. Document yearly throughput. 2. Document daily suppression activities and/or meteorological conditions.^d 3. On-site Fugitive Dust Observer located at crushing site during hours that crushing spread operates. 4. At least one Visible Emission Reader on staff. 5. Document visible emissions at or below 10% once per 8 hour shift at site.
Haul to crusher using loader, haul truck traffic on unpaved haul roads, mine truck traffic on unpaved haul roads, stockpiles fed by unloading trucks	<ol style="list-style-type: none"> 1. Document yearly throughput. 2. Speed control. 	<ol style="list-style-type: none"> 1. Document yearly throughput. 2. Record of: water truck use, street sweeper use, use of alternate dust control measures (e.g. use of recycled pavement, asphalt tack coat), and/or documentation of meteorological conditions.^d 3. On-site Fugitive Dust Observer located at crushing spread during hours that crusher spread operates. 4. Speed control implemented at crushing site. 	<ol style="list-style-type: none"> 1. Document yearly throughput. 2. Document daily suppression activities and/or meteorological conditions.^d 3. On-site Fugitive Dust Observer located at crushing site during hours that crushing spread operates. 4. At least one Visible Emission Reader on staff. 5. Document visible emissions at or below 10% once per 8 hour shift at site. 6. Speed control implemented at crushing site.

Footnotes from Tier Control Requirements Table:

- a. This table is not applicable for blasting, drilling, fuel use, truck loading by conveyor, truck unloading of fragmented stone, stockpile operations for stockpiles fed by conveyors, stockpile wind erosion, and overburden removal.
- b. DNR recognizes that moisture inherent to climatic conditions present in Wisconsin would allow for some control beyond the “bone dry” test numbers produced for AP-42. An estimation of 50% control is applied to these wet numbers.
- c. To be eligible for greater than 90% control, the crushing plant must be equipped with spraybars and these spraybars must be used when needed to maintain dust emissions within allowable limits.
- d. Companies need to keep records on-site regarding precipitation to be eligible for the 75% or greater than 90% control tier. Producers should add the following information to their on-site production sheets to address this requirement:

Type of Suppression

(spray bars, climatic, etc.)

Water

Water In Aggregate _____(check if applicable) or

Precipitation _____ (check if applicable) or

Added water _____ (supply quantity per time)

Appendix H
Best Management Practices

Best Management Practices

For purposes of this guidance, Best Management Practices (BMPs) are those activities used to control visible fugitive dust emissions. The following examples of BMPs are believed to be appropriate, however, there may be additional controls that prove to be equally effective. Accordingly, this listing is not all inclusive.

Hauling

1. Haul truck or scraper vehicle speeds posted at 15 mph.
2. Fugitive dust emissions from travelled areas controlled on an as-needed basis by applying water, asphalt millings, calcium chloride, or other acceptable control methods.
3. Paved travelled areas swept and/or watered as needed.

Crushing Plant Equipment

1. Use of spray bars.
2. Use of shrouds or other enclosures.

Stockpiles

1. Water when dust emissions seen or when dust emissions are felt by observer near stockpile.
2. Locate stockpiles below grade.

Appendix I

Voluntary General Operation Permit

Certification Form

[Not An Official DNR FORM]

Appendix J

Typical Crushing Spread

Appendix K

Example of a Record Keeping Sheet