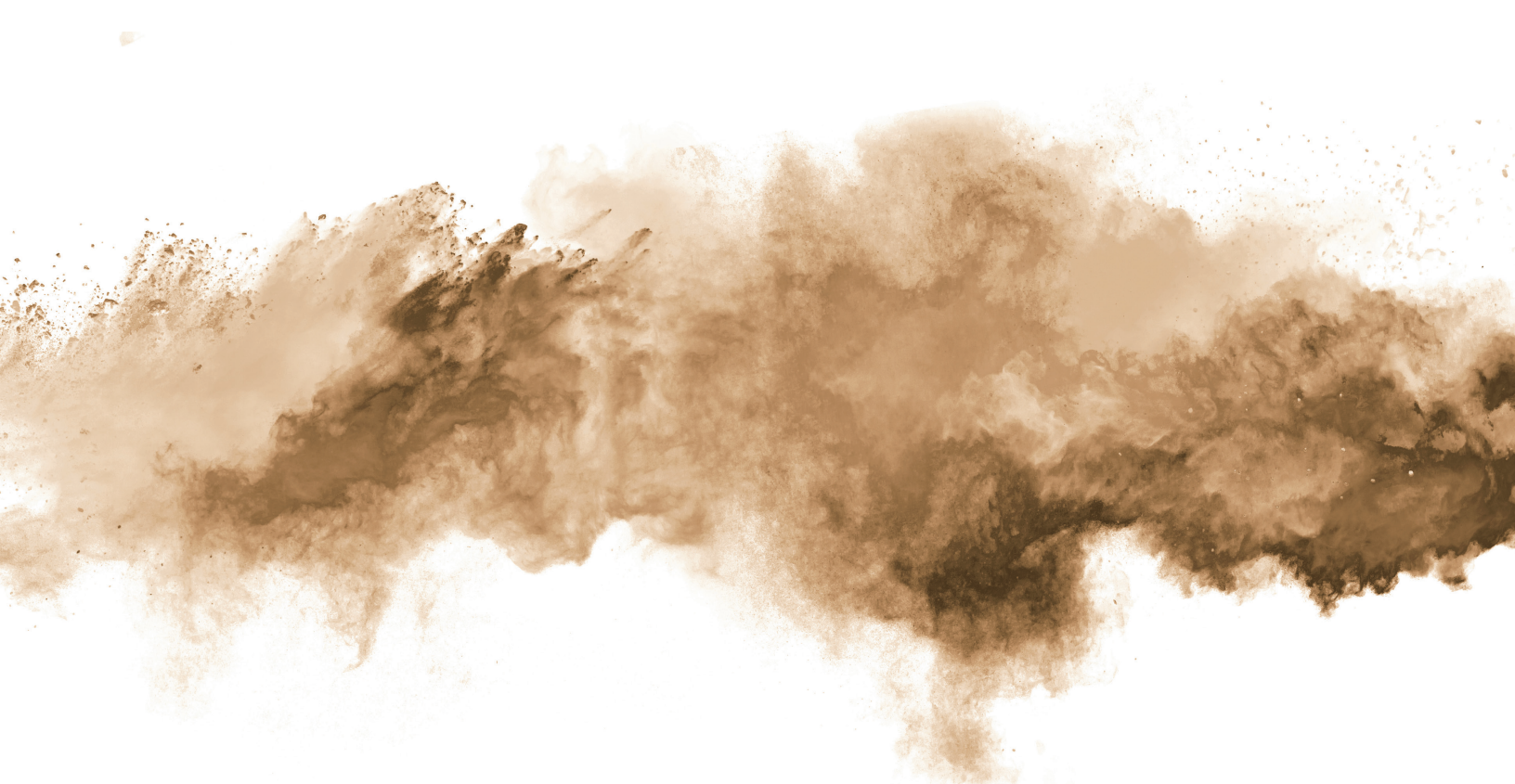




Managing Fugitive Dust

A Guide for Compliance with the Air Regulatory
Requirements for Particulate Matter Generation



This publication is intended for guidance only and may be impacted by changes in legislation, rules, policies, and procedures adopted after the date of publication. Although this publication makes every effort to teach users how to meet applicable compliance obligations, use of this publication does not constitute the rendering of legal advice.



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1.0 INTRODUCTION

This publication explains the federal and state statutes and rules that apply to the minimization of fugitive dust from industrial sources and transportation maintenance activities in Michigan. It also provides information on how to minimize fugitive dust generation, but is not a substitute for reading and understanding the federal standards and state rules that are applicable to various fugitive dust generating sources. Many of the state rules governing compliance with fugitive dust can be found in the *Michigan Air Pollution Control Rules*. Appendix A contains a copy of the state statute and rules that are cited throughout this document.

2.0 WHAT IS FUGITIVE DUST AND WHY IS IT AN AIR POLLUTION PROBLEM?

Michigan defines fugitive dust under R 336.1106(k) of the *Michigan Air Pollution Control Rules* as “*particulate matter which is generated from indoor processes, activities, or operations and which is emitted into the outer air through building openings and general exhaust ventilation, except stacks. The term also means particulate matter which is emitted into the outer air from outdoor processes, activities, or operations due to the forces of the wind or human activity.*” Emissions that are discharged from building stacks are not defined as fugitive dust, nor is fugitive dust considered to be a by-product of open burning activities.

Fugitive dust particles are comprised mainly of soil minerals (i.e. oxides of silicon, aluminum, calcium, and iron), but can also consist of sea salt, pollen, spores, etc. The most common regulated forms of particulate matter are known as PM₁₀ (particulate matter with a diameter of 10 microns or less in size) and PM_{2.5} (particulate matter with a diameter of 2.5 microns or less in size). PM₁₀ consists of contents such as soil, and are generally larger and less harmful than PM_{2.5} which is manifested in pollutant gases through physical changes or chemical reactions. Although most fugitive dust particles are larger than 10 microns in size (comparatively, the average human hair is 70 microns in diameter), all have the ability to settle quickly on the ground or adversely affect human health or the environment.



What types of activities generate fugitive dust? All activities have the potential to generate fugitive dust, although frequent and high levels of dust particles often originate from activities in the following industrial sectors: agricultural, mining, construction, manufacturing, transportation and utilities, wholesale/retail trade, and service. *Table 1* shows some of the more common sources and activities that have the potential to generate significant levels of fugitive dust.

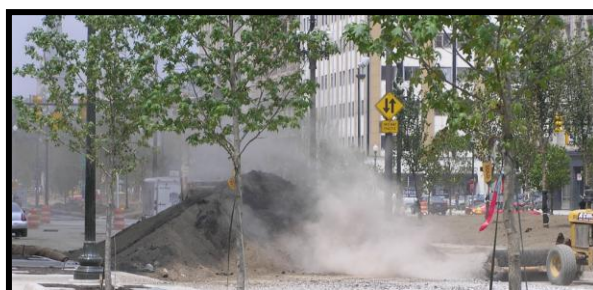


TABLE 1 – Fugitive Dust Generating Activities

INDUSTRIAL SECTOR	SOURCE	ACTIVITY
Agricultural	Grain Storage and Distribution	Loading and unloading grain in storage bins and silos, site maintenance, and track out
Mining	Mining and Quarries	Blasting, conveying and storage; site maintenance, and track out from truck and loading traffic
Construction	Industrial & Commercial Building	Equipment and truck use, soil disturbances, site and equipment maintenance, and track out
	Roadway Building, Paving	Equipment and truck use, soil disturbances, site and equipment maintenance, and track out
Manufacturing	Hot Mix Asphalt Processing and Application	Material crushing, screening operations, aggregate storage, baghouse collectates, recycling, and track out from truck and loading traffic
	Concrete Batch Processing and Application	Material crushing, front-end/hopper/bin loading, transfer conveying, aggregate storage piles, recycling, and track out from truck and loading traffic
	Foundries	Storage and transfer of coke used for process, fly ash
	Food & Agricultural Processing	Storage, transfer, conveying and track out
	Paper & Wood Products	Storage and track out
	Crushing Operations (Rock, Glass, Concrete, Demolition Material, etc.)	Loading, off-loading, crushing, conveying and storage, site maintenance, and track out
Transportation and Utilities	Road/Bridge Maintenance and Repair	Patching, clipping, sealing, shoulder repair, sweeping, concrete sawing and surface preparation for painting, rock salt storage, and site maintenance
	Rail Freight Yards	Loading and off-loading of rail cars, lot maintenance, and track out
	Truck Freight Haulers/Off-Loading Yards	Loading and off-loading, lot maintenance, and track out
	Utilities	Storage and transfer of coal used for process
	Unpaved parking lots	Vehicle traffic, lot maintenance, and track out
Wholesale/Retail Trade	Mineral Storage and Distribution	Transfers on-site and bulk storage, site maintenance, and track out
	General Material Storage (Glass, Concrete, Gravel, Sinter, Cement, Stone, Clay, Gypsum, Wood Chips)	Transfers on-site and bulk storage, site maintenance, and track out
Services	Landfill Yards	Transfers on-site; vehicle traffic; site maintenance; and track out
	Masonry & Equipment Abrasive Blasting	Hydro or compressed air blasting, site maintenance, and track out
	Building Demolition	Loading, off-loading, crushing, conveying, storage, transportation, and site maintenance
	Salvage Yards	Loading, off-loading, crushing, conveying, storage, transportation, and site maintenance

Any level of dust generation is considered air pollution. For example, excessive dust can cause damage to plant vegetation and reduce crop and livestock yields through contamination by its chemical composition. Wind generation of dust particles can cause the erosion of valuable topsoil and contribute to the soiling and discoloration of personal property, requiring monetary costs for repeated cleanup activities. Constant soiling can lead to adverse effects on property and land values in areas where fugitive dust generation is a known problem.



Like any air pollution problem, fugitive dust can also be a health nuisance. The smallest particles (2.5 microns or less in diameter) can easily be inhaled and travel to the deepest parts of the lungs, causing nose and throat irritation; respiratory illnesses, such as bronchitis, lung damage, and asthma; and even premature death in sensitive individuals. Generation of fugitive dust can also reduce visibility (i.e., haze) enough to cause moving vehicle or work site equipment accidents that can result in serious injury or death.

3.0 PERMITTING, MAJOR SOURCE DESIGNATIONS, AND FUGITIVE DUST

Some of the potential sources and activities related to fugitive dust generation (see *Table 1*) may be subject to federal and state air pollution control laws and rules. Determining which of these activities requires compliance with air quality regulations begins with an understanding of the air permitting requirements. Air permitting is the way regulatory agencies combine all applicable federal and state requirements associated with a source of air pollution into one legally enforceable document. Keep in mind that all owners/operators, who manage air pollution sources and who are exempt from the air permitting requirements, are still required to comply with other portions of state and local air pollution control rules and ordinances that regulate fugitive dust emissions.

3.1 THE PERMIT TO INSTALL

Any time a company contemplates the purchase of new equipment or the modification of existing equipment that has the potential to emit (PTE) air contaminants, numerous approvals, permits, and licenses may have to be obtained from state regulatory agencies. The regulatory activity associated with controlling air pollution is the Permit to Install or New Source Review (NSR) process. R 336.1201 of the *Michigan Air Pollution Control Rules* requires a person to obtain a Permit to Install prior to the installation, construction, reconstruction, relocation, or modification of equipment that emits air contaminants. Not all sources of air pollution need a permit. In addition to R 336.1201, there are numerous other state rules that exempt insignificant sources of air pollution from having to get air pollution control permits.

Below are some of the important characteristics of the Michigan Permit to Install program:

- A Permit to Install is a state license to emit air contaminants into the ambient air.
- Facility compliance with the conditions of a permit helps improve the level of protection provided to both the public health and the environment.

- After the permitting process, the applicant will know which federal and state rules apply to the equipment covered under the permit.
- Conditions for operation in the Permit to Install limit a facility's potential to emit air contaminants.
- No fees are associated with obtaining a Permit to Install.
- A Permit to Install does not expire and does not have to be renewed.

The Permit to Install program is administered by the Permit Section, Air Quality Division (AQD) of the Michigan Department of Environmental Quality (MDEQ).

3.2 THE RENEWABLE OPERATING PERMIT (ROP)

The Renewable Operating Permit is an extension of the Permit to Install; it does not supersede or replace the Permit to Install requirements. The Renewable Operating Permit (ROP) program is a requirement of Title V of the federal Clean Air Act Amendments of 1990 (CAAA). The ROP clarifies the requirements that apply to a facility that emits air contaminants. At present, air pollution control obligations are scattered among numerous state and federal regulations. When a ROP is issued, it pulls together all of a facility's air pollution control requirements (including those in the Permit to Install) into a single document, giving the facility and state regulatory agencies, the U.S. Environmental Protection Agency (EPA), and the public a better picture of the type and level of air emissions at the facility. Facilities that meet the definition for a "major source" of air pollution emissions must obtain a ROP.

3.3 DO FUGITIVE DUST EMISSIONS HAVE TO BE INCLUDED IN "MAJOR SOURCE" DETERMINATIONS?

Facilities that meet one of the many definitions of "major source" fall under some very complex air permitting requirements. In simple terms, a major source is one that has the potential to emit (PTE) air pollutants in excess of various emission thresholds. Potential to emit is defined as "*the amount of pollutants emitted by an emission unit operating at full capacity and continuous operation (i.e., 24 hours/day and 365 days/year).*" PTE is typically expressed in units of tons of air pollutant emitted per year. The only way a facility can lower its PTE is through operating restrictions, which are legally enforceable conditions of an approved Permit to Install. As mentioned above, a facility that is a "major source" as defined under the ROP program, must submit a ROP application. Under NSR, a facility that is proposing to install or modify a "major source" is subject to Prevention of Significant Deterioration (PSD) and/or off-set requirements.

Some examples of major sources:

- *If the source has the potential to emit more than 250 tons of PM₁₀ per year, and it cannot limit its PTE to less than 250 tons through permit conditions, it is considered a major source under NSR.*
- *If a source has the potential to emit more than 100 tons of PM₁₀, and it cannot limit its PTE below the thresholds through permit conditions, it is considered a major source under the ROP program.*

This leads us to the all-important question: Do fugitive dust emissions have to be included in major source determinations? If the source is one of the industrial source categories listed in *Table 2* on the following page, then it must quantify its fugitive dust emissions and include them in its PTE calculations. Thus, fugitive dust emissions from sources listed in *Table 2* must be considered in the determination of major source under both the NSR and ROP programs. The list of activities or emission source categories comes from the definition of “potential to emit” in R 336.1116(m) of the *Michigan Air Pollution Control Rules*.

4.0 DETERMINING OPACITY

When fugitive dust rises into the air, it is measured by its level of opacity, or the level at which the dust reduces the transmission of light or obscures an observer’s view. The greater the concentration of fugitive dust, the greater the opacity designation. Opacity is measured by visible emission observation protocol which requires recordkeeping and documentation of the levels of particulate matter in the air. In 1974, EPA standardized the set of protocols or methods used to measure air opacity. Each method details the level and certification of observer training, as well as the calibration and design specification for the equipment used to train and certify observers. All methods are designed to ensure that reliable and repeatable visual emission observations are consistent.



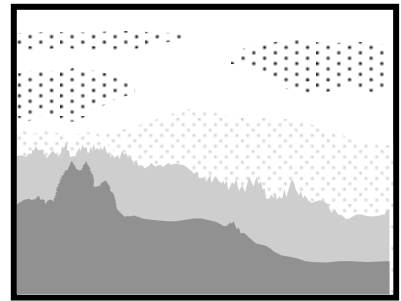
Three of the most common protocols or methods used today are Method 9, 9D, and 22. EPA Method 9, also known as the “Visible Determination of Opacity of Emissions from Stationary Sources,” involves the recording of readings as a percentage of opacity in terms of black and white particulate plumes or dense clouds of matter. For example, a plume could be measured from a stationary source as having a 20% opacity if the visible emissions against a white backdrop allow only 80% of the backdrop to be viewed. Under Method 9, readings are taken every 15 seconds, averaging 24 consecutive readings over a 6-minute period (unless a different time period is specified in an emission standard such as a New Source Performance Standard [NSPS]). While Method 9 is used extensively to sight and control visible emissions from stationary and non-stationary industrial processes, Method 9D is used to measure visible emissions from unconfined places such as roads and bulk material storage areas.

Table 2 - Industrial Sources Categories That Must Quantify Fugitive Dust Emissions

Stationary Source Categories	
(i) Coal cleaning plants with thermal dryers.	(xviii) Sintering plants.
(ii) Kraft pulp mills.	(xix) Secondary metal production plants.
(iii) Portland cement plants.	(xx) Chemical process plants.
(iv) Primary zinc smelters.	(xxi) Fossil fuel boilers (or combination thereof) totaling more than 250,000,000 Btu per hour heat input.
(v) Iron and steel mills.	(xxii) Petroleum storage and transfer units with a total storage capacity of more than 300,000 barrels or petroleum storage vessels with a capacity of more than 40,000 gallons.
(vi) Primary aluminum ore reduction plants.	(xxiii) Taconite ore processing plants.
(vii) Primary copper smelters.	(xxiv) Glass-fiber processing plants.
(viii) Municipal incinerators capable of charging more than 50 tons of refuse per day.	(xxv) Charcoal production plants.
(ix) Hydrofluoric, sulfuric, or nitric acid plants.	(xxvi) Fossil fuel-fired steam electric plants of more than 250,000,000 Btu per hour heat input.
(x) Petroleum refineries.	(xxvii) Asphalt concrete plants.
(xi) Lime plants.	(xxviii) Secondary lead smelters and refineries.
(xii) Phosphate rock processing plants.	(xxix) Sewage treatment plants.
(xiii) Coke oven batteries.	(xxx) Phosphate fertilizer plants.
(xiv) Sulfur recovery plants.	(xxxi) Ferroalloy production plants.
(xv) Carbon black plants with a furnace process.	(xxxii) Grain elevators.
(xvi) Primary lead smelters.	(xxxiii) Stationary gas turbines.
(xvii) Fuel conversion plants.	(xxxiv) Stationary sources that are subject to the federal National Emission Standards for Hazardous Air Pollutants (NESHAP) for the following materials: (A) Asbestos; (B) Beryllium; (C) Mercury; (D) Vinyl chloride.

Source: R 336.1116(m)(i)-(xxiv), *Michigan Air Pollution Control Rules*

Method 22 is unlike Methods 9 or 9D because it checks only for the presence or absence of visible emissions from sources, and does not require that emissions be qualified as black and white particulate plumes. Method 22 is often used in the regulation of fugitive emissions from toxic materials that: escape during material transfer (i.e. asbestos removal); escape from buildings housing material processing or handling equipment (i.e. asbestos presence in building demolitions); and/or are not captured by an exhaust hood or are emitted directly from process equipment.



It is important to have a working knowledge of these opacity protocols, as they can be used by both sources of fugitive dust generation and regulatory personnel for compliance verification with air regulations. For instance, Michigan Rule 336.1301 expands on EPA Method 9 by setting state standards for the density of emissions by prohibiting the discharge from a process or process equipment into the outer air of any visible emissions with a visible emission opacity density greater than:

- A (6) minute average of 20% opacity with one allowance of a 27% opacity reading per (6) minute average per hour;
- The limit specified by an applicable federal New Source Performance Standard (NSPS); or
- The limit specified as a condition of a Permit to Install or Renewable Operating Permit, whichever is more stringent.

Note: Owners/operators of a process may request that the AQD establish an alternate opacity level based on an allowable particulate emission rate listed in Michigan R 336.1331. An alternate opacity level can be established by the MDEQ if: the new opacity level or a legally enforceable schedule of compliance meets the conditions of other state rules; the old opacity level is not technically or economically feasible for a facility; or if the MDEQ is assured that reasonable measures to reduce opacity have been implemented or will be implemented by a facility on an approved schedule by the MDEQ.

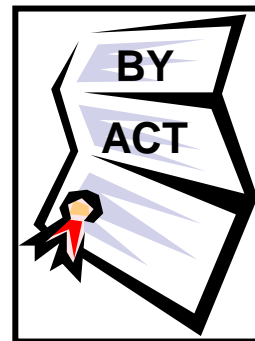
5.0 FUGITIVE DUST CONTROL PROGRAMS

What is a fugitive dust control program? It is an operating program that is designed to significantly reduce the fugitive dust emissions to the lowest level that a particular source is capable of achieving by the application of control technology that is reasonably available, based on technological and economic feasibility. Fugitive dust control programs can either be required by public act or state rule. The following explains the difference between the two applicable requirements and when fugitive dust programs are required for each.

5.1 WHEN ARE FUGITIVE DUST PROGRAMS REQUIRED BY PUBLIC ACT?

The first provisional requirement is Section 324.5524, Part 55 (Air Pollution Control) of the Natural Resources and Environmental Protection Act (Public Act 451 of 1994, as amended) that applies to all facilities located within the Table 36 areas of Michigan R 336.1371 of the *Michigan Air Pollution Control Rules* (see *Appendix A* of this document for the areas listed in Michigan R 336.1371,

Table 36). Section 324.5524 was originally enacted to help control and monitor particulate matter emissions from a number of areas in the state which were previously classified as not being in federal attainment status for Total Suspended Particulate or TSP (the Table 36 areas of R336.1371). Facilities with potential fugitive dust-generating activities, and located within these non-attainment areas, were required to develop and file a fugitive dust program with the state.



Section 324.5524(1-2) mandates fugitive dust programs and opacity limits for facilities with the following standard industrial classification codes (SICs):

- SIC 10-14 – Mining Operations;
- SIC 20-39 – Manufacturing Operations;
- SIC 40 – Railroad Transportation;
- SIC 42 - Motor Freight Transportation and Warehousing;
- SIC 491- Electric Services;
- SIC 495 – Sanitary Services; and
- SIC 496 – Steam Supply.

These facility types cannot cause or allow the emission of fugitive dust from any road, lot, or storage pile (including material handling activities) that has an opacity measurement greater than 5% as determined by EPA Protocol Reference Method 9D. All other fugitive dust sources at subject facilities are restricted to an opacity measurement of no greater than 20% as determined by EPA Protocol Reference Method 9D. In addition to meeting the opacity limits stated in Section 324.5524(2), fugitive dust sources must also include specific dust suppression methods for certain source activities in their fugitive dust programs. *Table 3* details what types of activities are applicable and the dust suppression means to be implemented as stated in Section 324.5524(3)(a)(i -v).

On October 4, 1996, the last of Michigan's non-attainment areas were redesignated to be in attainment for PM₁₀, allowing the whole state to be in full attainment for particulate matter emissions. Although Section 324.5524 was enacted to address the problems of TSP in non-attainment areas, it is still an applicable requirement for designated facilities to create fugitive dust programs. For those facilities who obtain a Permit to Install, compliance with Section 324.5524 is often addressed as a condition for permit issuance.

Table 3 - Spraying Requirements for Fugitive Dust Sources

Fugitive Dust Source If you have....	Other Source Requirements and	Means of Dust Suppression then...
Material Storage piles	The total uncontrolled emissions of fugitive dust from all piles at a facility is in excess of 50 tons per year, and where such piles are located within a facility with potential particulate emissions from all sources including fugitive dust sources and all other sources exceed 100 tons per year	Material storage piles must be protected by a cover, enclosed, sprayed with water or a surfactant solution, or treated by an equivalent method.
Conveyor loading operations to storage piles	N/A	Conveyor loading operations to storage piles must utilize spray systems, telescopic chutes, stone ladders, or other equivalent methods.
Batch loading operations to storage piles	N/A	Batch loading operations to storage piles must utilize spray systems, limited drop heights, enclosures, or other equivalent methods.
Unloading operations from storage piles	N/A	Unloading operations from storage piles must utilize rake reclaimers, bucket wheel reclaimers, under-pile conveying, pneumatic conveying with baghouse, water sprays, gravity-feed plow reclaimer, front-end loaders with limited drop heights, or other equivalent methods.
Traffic pattern access areas surrounding storage piles and all traffic pattern roads and parking facilities	N/A	Traffic access areas surrounding storage piles and roads must be paved or treated with water, oils, or chemical dust suppressants. All areas must be cleaned and treated according to a fugitive dust program (plan).
Unloading and transporting operations of materials collected by pollution control equipment	N/A	Unloading and transporting operations of materials collected by pollution control equipment must utilize spraying, pelletizing, screw conveying, or other equivalent methods.
Crushers, grinding mills, screening operations, bucket elevators, conveyor transfer points, conveyor bagging operations, storage bins, and fine product truck and railcar loading operations	N/A	Crushers, grinding mills, screening operations, bucket elevators, conveyor transfer points, conveyor bagging operations, storage bins, and fine product truck and railcar loading operations must be sprayed with water or a surfactant solution, utilize choke-feeding, or be treated by an equivalent method.

Source: P.A. 451, Part 55, Section 324.5524(3)(a)(i-v)

5.2 WHEN ARE FUGITIVE DUST PROGRAMS REQUIRED BY RULE?

The Air Quality Division (AQD) of the Michigan Department of Environmental Quality may, based on air emission measurements or citizen complaints, require a fugitive dust program from a facility if it processes, uses, stores, transports, or conveys bulk materials from a highly emitting dust source (see *Table 4*), or is a listed activity in Michigan R 336.1372, and is not listed in Table 36 of R336.1371. Michigan R336.1371 requires these facilities, upon request, to submit a fugitive dust plan within a 6-month period to the AQD incorporating the following information:

- The reasonably necessary fugitive dust control operating practices, methodologies, or available technologies as detailed in Michigan R 336.1372;
- The type of fugitive dust control methods that would be the most effective, taking into account the quantity, moisture content, specific gravity, and particle size distribution of the bulk materials on-site;
- The level of recordkeeping and maintenance requirements for activities that are implemented under the dust program; and
- The type of control technologies, methods, and equipment to be implemented or installed, as well as the progress schedule for implementation or installation.

Fugitive dust control programs required by rule are subject to the review and approval of the AQD, and must be implemented upon granted approval. A facility may request modification of its dust control program within 3 months of notification to the AQD if they can demonstrate that any part of the facility is not subject to the requirements of this rule. A facility may also request a revision to a submitted dust plan so that it meets the changing conditions at the facility. Those facilities that are required to have a dust program as a condition of their permit may also institute equipment and best management practice changes as needed in order to stay in compliance with the particulate matter limits delineated by their permit conditions. Finally, should a facility neglect to submit a dust control program within 6 months of being requested to, that facility may be subject to a binding consent order, mandating the existence of a fugitive dust program.

Both Michigan R336.1371 and R336.1372 were structured to work in conjunction with one another. Michigan R336.1372 lists the required actions and the control methods typically used in fugitive dust control programs for certain dust-generating activities. Detailed provisions for highly emitting fugitive dust sources (see *Table 4*), can be found in R336.1372 of the *Michigan Air Pollution Control Rules* located in *Appendix A* of this document.

Table 4 - Source Activities with Highly Monitored Dust Emissions

Type of Fugitive Dust Source	
Loading and unloading of open storage piles	Inactive storage piles
Transporting bulk materials	Building ventilation
Outdoor conveying	Roads and lots
Construction, renovation, and demolition	

Source: R336.1372(1-8), *Michigan Air Pollution Control Rules*

5.3 PERMITS AND CONSENT ORDERS

Today, fugitive dust control programs that are incorporated as a condition of a Permit to Install or environmental consent order, are the most widely used mechanisms to regulate fugitive dust sources. For example, if a facility wishes to install or modify a new piece of equipment or control device, a fugitive dust program may be incorporated as a permit condition upon issuance of the Permit to Install. For your convenience, sample dust control plans can be found in *Appendix B*. Fugitive dust programs involving consent orders are usually a result of citizen complaints to the MDEQ AQD for excessive dust generation from a facility's dust emission source. Those fugitive dust control programs that are required under Michigan R 336.1371 by either a regulatory authority or in a New Source Review or Renewable Operating Permit, must be reviewed and approved by the Michigan Department of Environmental Quality's Air Quality Division.

A section of each fugitive dust control program should address the collection and disposal of air contaminants. Michigan R336.1370 requires sources that collect air contaminants to maintain the required operating efficiency of their equipment while minimizing the introduction of air contaminants to the outer air.

Example: A source is operating a piece of equipment that captures dust (i.e. a facility with a baghouse control device). The equipment must be maintained to ensure the best operating efficiency. Maintenance would include periodic emptying of holding areas and proper disposal of captured dust, unclogging excessive dust in access hoses or pipes, and washing down the equipment as necessary.

Dust control programs are only effective when implemented with regularity. It is important that facilities design realistic dust control programs incorporating both methods and work practices that are feasible for their work site activities.

6.0 FUGITIVE DUST AS A NUISANCE

Michigan R336.1901 is also applicable to fugitive dust generating sources. It states that a person cannot cause or permit the emission of an air contaminant, alone or in reaction with other air contaminants, that would result in injurious effects to human health or safety, animal life, or plant life of significant value, or cause the unreasonable interference with the comfortable enjoyment of life and property.

7.0 DO BUSINESSES HAVE TO PAY FEES FOR FUGITIVE DUST EMISSIONS?

A portion of the air fee that some Michigan businesses and institutions must pay annually is based upon the annual emissions of certain air pollutants. The Michigan Air Emission Reporting System (MAERS) contains the reporting forms and instructions that facilities use to quantify and report their annual emissions to the MDEQ AQD. Based on a facility's reported emissions through MAERS, businesses are required to pay an annual flat air quality fee according to what emission category that the facility falls into. Along with the flat fee that "major" and New Source Performance Standard (NSPS) sources are required to pay, there is also an additional per ton emissions charge. All fees, generated from the MAERS reporting, are used to support the state's air quality regulatory programs.

All of processes that operate at a facility have a distinct Source Classification Code (SCC). Each SCC has associated emission factors that can be used to quantify their emissions. There are SCCs in MAERS that correspond to a number of fugitive dust activities, so if a source operates a process that creates a fugitive dust activity for which there is a SCC, it must quantify the type of emissions and report it to MAERS. Based on the information reported, a facility may be required to pay air quality fees which are calculated based on reported fugitive dust emissions.

Example: MAERS contains a source classification code, 3-05-025-04, that corresponds to the fugitive emissions from haul roads at sand and gravel operations. There is an emission factor associated with that SCC (6.2 lbs. of particulate matter (PM)/vehicle mile traveled) which allows the facility to calculate its fugitive emissions based upon the number of vehicle miles traveled. (More information on how to quantify fugitive dust emissions is found in the proceeding section).

8.0 QUANTIFYING FUGITIVE DUST EMISSIONS FOR REPORTING PURPOSES

Some facilities may need to estimate their emissions of fugitive dust to comply with various air regulatory programs. Air permitting requirements, such as New Source Review and the Renewable Operating Permit program, require the estimation of potential emissions of air contaminants, including some fugitive emissions from select categories, to determine whether or not a source is "major." (See Section 3.3 for more details on the term "major source"). Additionally, those required to annually report their emissions under MAERS may need to calculate and report the actual annual emissions of fugitive dust from some of their emission units. (See the above section for details).

How does one calculate emissions for fugitive dust? The number of options available to calculate fugitive emissions is less than those available for non-fugitive emissions. Emission units, which emit pollutants in a confined flow stream, can utilize stack test data and continuous emission monitors (CEMS), as well as federally recognized emission factors and computer models. Fugitive emission sources often times have to rely solely on emission factors and models.

Emission factors are typically expressed as the amount of pollutant emitted per activity. For example, for sand blasting of mild steel panels, the PM₁₀ emission factor is:

$$EF_{(PM_{10})} = 13 \text{ lbs. PM}_{10}/1,000 \text{ lbs. of abrasive}$$

To determine your emissions, simply multiply the EF(PM₁₀) by the total pounds of abrasive used. For example, if 55,000 pounds of abrasive were used in the year:

$$13 \text{ lbs. PM}_{10}/1,000 \text{ lbs. abrasive} * 55,000 \text{ pounds abrasive} = 715 \text{ lbs. of PM}_{10}/\text{yr.}$$

The Environmental Protection Agency's online publication entitled, *Compilation of Air Pollutant Emission Factors (AP-42)*, 5th edition, contains emission factors for a myriad of emission units including those emitting fugitive dust. Chapter 13.2 contains a list of fugitive dust sources within the AP-42 publication. To view these chapters, go www.epa.gov/ttn/chieff/ap42/index.html.

AP-42 Fugitive Dust Emission Factors

Chapter and Section	Title
13.2	Fugitive Dust Sources
13.2.1	Paved Roads
13.2.2	Unpaved Roads
13.2.3	Heavy Construction Operations
13.2.4	Aggregate Handling and Storage Piles
13.2.5	Industrial Wind Erosion
13.2.6	Abrasive Blasting

9.0 WHAT CAN YOU DO TO MINIMIZE OR ELIMINATE FUGITIVE DUST?

- Know and comply with air regulations that are applicable to all activities which may take place at your job site.
- Comply with the permit conditions for your facility's operation including the procedures set forth in a fugitive dust control program (plan).
- Have facility personnel become certified in the EPA federal protocol methods for measuring visible emissions.
- Minimize the surface area that can be disturbed and use wind erosion controls.
- Limit work or activities which may generate dust to less windy days.
- Apply dust suppression measures as needed.
- Clean up bulk material spills immediately.



- Follow the best management and industry practices listed in Michigan R336.1372 for your type of activity. Table 5 provides a list of best management practices (BMPs) to minimize fugitive dust generation from activities not directly regulated under R336.1372.

Table 5 - Fugitive Dust Best Management Practices

Fugitive Dust Activity	Best Management Practice
Abrasive Dry Blasting	<ul style="list-style-type: none"> • Conduct activity when wind velocities do not exceed 20 miles per hour. • When practical, utilize wind screens, tarpaulins, hoods, vacuum blasting, or other emission reduction/containment techniques. • Abrasives should be clean, light-weight, and contain no more than 5% (by weight) of quartz. • Wet down spent, abrasive material and periodically remove from job site.
Debris/Land Clearing & Earth Moving	<ul style="list-style-type: none"> • Minimize agitation or disturbance activities where possible. • Conduct activity on less windy days. • Reduce wind effects with windbreaks where practicable. • Apply water, spray-on adhesives, or synthetic/organic treatments to potential dust area. • Establish a truck and wheel wash at the entrance/exit to the area. • Provide an area of crushed stone or gravel at the entrance/exit of the property to assist in dislodging PM. • Clean up trackage and spillage on roads immediately. • Require tarpaulins for all haul vehicles. • Develop procedures & operating practices for timely review of housekeeping activities to exposed or active surfaces.
Unpaved Roads/Scrap Yards	<ul style="list-style-type: none"> • Establish a speed limit for all vehicles using the road. • Apply water, spray-on adhesives, or synthetic/organic treatments to potential dust area. • Establish a truck and wheel wash at the entrance/exit to the road. • Provide an area of crushed stone or gravel at the entrance/exit of the property to assist in dislodging PM. • Clean up trackage and spillage from unpaved roads onto paved roads immediately. • Turn unpaved areas into paved areas where feasible. • Develop procedures & operating practices for timely review of housekeeping activities to exposed or active surfaces.

10.0 WHY SHOULD YOU COMPLY?

10.1 GENERAL DUTY

Sources whose activities generate fugitive dust have a responsibility to their workers and the community to provide as clean and as safe a working environment as possible. Nuisance complaints for excessive dust generation that crosses beyond property lines can be filed by anyone in the community in which you operate, and complaints are investigated by the AQD district staff under the provision of R336.1901 of the *Michigan Air Pollution Control Rules*.

Compliance with federal, state, and local requirements, as well as adhering to best management practices will ultimately reduce public and worker exposure to fugitive dust, and keep facilities and work sites with sources of air pollution operating within the law.

10.2 CONTRACTUAL OBLIGATION

Construction sources seeking publicly-funded contracts with state and local department of transportation agencies are bound by the Michigan Department of Transportation's (MDOT) [2012 Standard Specifications for Construction](#). Section 107.01 of the *2012 Michigan Standard Specifications for Construction*, entitled the "Legal Relations and Responsibilities to the Public – Laws to Be Observed," requires contractors to be familiar with all standards, state and federal laws, rules, executive orders, regulations, and local ordinances that affect the equipment, materials, workers and the conduct associated with a proposed construction job. Construction contractors must perform all work required to comply with Part 55 of the Natural Resources and Environmental Protection Act (Public Act 451 of 1994, as amended) including obtaining written approval for new air permits.

For example, Section 107.15(A) of MDOT's Standard Specifications, the "Control of Air Pollution," requires bituminous, concrete, and crushing plants to apply for new permits at least 60 calendar days prior to the plant being installed near a construction site. (For these same sources with existing permits, MDOT requires that changes to permit applications be submitted a minimum of 30 days prior to new plant installation). It is important to note that while MDOT requires an advanced application of 30 days to submit relocation or modification changes to air permitted sources, the Air Quality Division of the MDEQ requires that facilities submit source relocation and modification change forms not less than 10 days prior to the scheduled relocation or new equipment installation. Along with meeting the state's air permitting requirements, MDOT construction contractors also assume liability for any fines and penalties that occur for failure to meet the applicable air quality requirements.

Section 107.15(A) of MDOT's Standard Specifications refers specifically to (fugitive) dust control by calling for adequate dust control measures to prevent damage to any property, residence, or business, and to ensure the safety, health, welfare or comfort of any person near a construction zone. Section 107.19 of the MDOT Standard Specifications also requires that contractors clean up any material that is hauled from a job site and tracked out onto local roads and streets. Finally, the Michigan Department of Transportation's Project Engineer retains the right to shut down a contractor's job site if the contractor is not in compliance with the applicable air quality requirements and can require immediate remedial action in order to achieve compliance.

10.3 ENFORCEMENT

STATEWIDE

Section 113 of the Clean Air Act Amendments (CAAA), and Part 55 of Public Act 451 include some strong enforcement provisions with both civil and criminal sanctions for businesses that are in violation of the law. Examples of common fugitive dust violations include violating opacity standards and not following the dictates of a fugitive dust plan, such as not sufficiently wetting down dusty surface areas to prevent blowing dust. From a regulatory standpoint, any of these examples could prompt the MDEQ AQD to issue a Letter of Violation (LOV) or to pursue further enforcement action for the violations.

11.0 STATE CONTACTS

Questions regarding state and federal compliance requirements can be referred to the MDEQ's Environmental Assistance Center 800-662-9278 (deq-assist@michigan.gov) or the appropriate AQD district office (see *Appendix C* for the nearest air quality district office location).

ACRONYMS

AQD.....	Air Quality Division of MDEQ
CAAA ...	Clean Air Act Amendments of 1990
CEMS	Continuous Emission Monitors
CHIEF	Clearing House for Emission Inventory and Factors
CFR.....	Code of Federal Regulations
EPA	Environmental Protection Agency
HAPs	Hazardous Air Pollutants
LOV	Letter of Violation
MAERS	Michigan Air Emissions Reporting System
MDEQ.....	Michigan Department of Environmental Quality
NAA	Non-attainment Area
NAAQS	National Ambient Air Quality Standards
NESHAP	National Emission Standard for Hazardous Air Pollutants
NSPS.....	New Source Performance Standards
NSR.....	New Source Review
PM.....	Particulate Matter
PSD	Prevention of Significant Deterioration
PTE.....	Potential-To-Emit
ROP.....	Renewable Operating Permit
SCC.....	Source Classification Code

APPENDIX A
AIR POLLUTION CONTROL RULES

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NATURAL RESOURCES AND ENVIRONMENTAL PROTECTION ACT (EXCERPT)
Act 451 of 1994

324.5524 Fugitive dust sources or emissions.

Sec. 5524.

(1) The provisions of this section, including subsection (2), shall apply to any fugitive dust source at all mining operations, standard industrial classification major groups 10 through 14; manufacturing operations, standard industrial classification major groups 20 through 39; railroad transportation, standard industrial classification major group 40; motor freight transportation and warehousing, standard industrial classification major group 42; electric services, standard industrial classification group 491; sanitary services, standard industrial classification group 495; and steam supply, standard industrial classification group 496, which are located in areas listed in table 36 of R 336.1371 of the Michigan administrative code.

(2) Except as provided in subsection (8), a person responsible for any fugitive dust source regulated under this section shall not cause or allow the emission of fugitive dust from any road, lot, or storage pile, including any material handling activity at a storage pile, that has an opacity greater than 5% as determined by reference test method 9d. Except as otherwise provided in subsection (8) or this section, a person shall not cause or allow the emission of fugitive dust from any other fugitive dust source that has an opacity greater than 20% as determined by test method 9d. The provisions of this subsection shall not apply to storage pile material handling activities when wind speeds are in excess of 25 miles per hour (40.2 kilometers per hour).

(3) In addition to the requirements of subsection (2), and except as provided in subdivisions (e), (f), and (g), a person shall control fugitive dust emissions in a manner that results in compliance with all of the following provisions:

(a) Potential fugitive dust sources shall be maintained and operated so as to comply with all of the following applicable provisions:

(i) All storage piles of materials, where the total uncontrolled emissions of fugitive dust from all such piles at a facility is in excess of 50 tons per year and where such piles are located within a facility with potential particulate emissions from all sources including fugitive dust sources and all other sources exceeding 100 tons per year, shall be protected by a cover or enclosure or sprayed with water or a surfactant solution, or treated by an equivalent method, in accordance with the operating program required by subsection (4).

(ii) All conveyor loading operations to storage piles specified in subparagraph (i) shall utilize spray systems, telescopic chutes, stone ladders, or other equivalent methods in accordance with the operating program required by subsection (4). Batch loading operations to storage piles specified in subparagraph (i) shall utilize spray systems, limited drop heights, enclosures, or other equivalent methods in accordance with the operating program required by subsection (4). Unloading operations from storage piles specified in subparagraph (i) shall utilize rake reclaimers, bucket wheel reclaimers, under-pile conveying, pneumatic conveying with baghouse, water sprays, gravity-feed plow reclaimer, front-end loaders with limited drop heights, or other equivalent methods in accordance with the operating program required by subsection (4).

(iii) All traffic pattern access areas surrounding storage piles specified in subparagraph (i) and all traffic pattern roads and parking facilities shall be paved or treated with water, oils, or chemical dust suppressants. All paved areas, including traffic pattern access areas surrounding storage piles specified in subparagraph (i), shall be cleaned in accordance with the operating program required by subsection (4). All areas treated with water, oils, or chemical dust suppressants shall have the treatment applied in accordance with the operating program required by subsection (4).

(iv) All unloading and transporting operations of materials collected by pollution control equipment shall be enclosed or shall utilize spraying, pelletizing, screw conveying, or other equivalent methods.

(v) Crushers, grinding mills, screening operations, bucket elevators, conveyor transfer points, conveyor bagging operations, storage bins, and fine product truck and railcar loading operations shall be sprayed with water or a surfactant solution, utilize choke-feeding, or be treated by an equivalent method in accordance with an operating program required under subsection (4). This subparagraph shall not apply to high-lines at steel mills.

(b) If particulate collection equipment is operated pursuant to this section, emissions from such equipment shall not exceed 0.03 grains per dry standard cubic foot (0.07 grams per cubic meter).

(c) A person shall not cause or allow the operation of a vehicle for the transporting of bulk materials with a silt content of more than 1% without employing 1 or more of the following control methods:

(i) The use of completely enclosed trucks, tarps, or other covers for bulk materials with a silt content of 20% or more by weight.

(ii) The use of tarps, chemical dust suppressants, or water in sufficient quantity to maintain the surface in a wet condition for bulk materials with a silt content of more than 5% but less than 20%.

(iii) Loading trucks so that no part of the load making contact with any sideboard, side panel, or rear part of the load comes within 6 inches of the top part of the enclosure for bulk materials with a silt content of more than 1% but not more than 5%.

(d) All vehicles for transporting bulk materials off-site shall be maintained in such a way as to prevent leakage or spillage and shall comply with the requirements of section 720 of the Michigan vehicle code, Act No. 300 of the Public Acts of 1949, being section 257.720 of the Michigan Compiled Laws, and with R 28.1457 of the Michigan administrative code.

(e) The provisions of subdivisions (c) and (d) do not apply to vehicles with less than a 2-ton capacity that are used to transport sand, gravel, stones, peat, or topsoil.

(f) The provisions of subdivision (c)(i) and (ii) do not apply to fly ash which has been thoroughly wetted and has the property of forming a stable crust upon drying.

(g) The provisions of subdivision (c) do not apply to the transportation of iron or steel slag if the vehicles do not leave the facility and the slag has a temperature of 200 degrees fahrenheit or greater.

(4) All fugitive dust sources subject to the provisions of this section shall be operated in compliance with both the provisions of an operating program that shall be prepared by the owner or operator of the source and submitted to the department and with applicable provisions of this section. Such operating program shall be designed to significantly reduce the fugitive dust emissions to the lowest level that a particular source is capable of achieving by the application of control technology that is reasonably available, considering technological and economic feasibility. The operating program shall be implemented with the approval of the department.

(5) The operating program required by subsection (4) is subject to review and approval or disapproval by the department and shall be considered approved if not acted on by the department within 90 days of submittal. All programs approved by the department shall become a part of a legally enforceable order or as part of an approved permit to install or operate. At a minimum, the operating program shall include all of the following:

(a) The name and address of the facility.

(b) The name and address of the owner or operator responsible for implementation of the operating program.

(c) A map or diagram of the facility showing all of the following:

(i) Approximate locations of storage piles.

(ii) Conveyor loading operations.

(iii) All traffic patterns within the facility.

(d) The location of unloading and transporting operations with pollution control equipment.

(e) A detailed description of the best management practices utilized to achieve compliance with this section, including an engineering specification of particulate collection equipment, application systems for water, oil, chemicals, and dust suppressants utilized, and equivalent methods utilized.

(f) A test procedure, including record keeping, for testing all waste or recycled oils used for fugitive dust control for toxic contaminants.

(g) The frequency of application, application rates, and dilution rates if applicable, of dust suppressants by location of materials.

(h) The frequency of cleaning paved traffic pattern roads and parking facilities.

(i) Other information as may be necessary to facilitate the department's review of the operating program.

(6) Except for fugitive dust sources operating programs approved by the department pursuant to R 336.1373 of the Michigan administrative code between April 23, 1985 and May 12, 1987, the owner or operator of a source shall submit the operating program required by subsection (4) to the department by August 12, 1987.

(7) The operating program required by subsection (4) shall be amended by the owner or operator so that the operating program is current and reflects any significant change in the fugitive dust source or fugitive dust emissions. An amendment to an operating program shall be consistent with the requirements of this section and shall be submitted to the department for its review and approval or disapproval.

(8) Upon request by the owner or operator of a fugitive dust source, the department may establish alternate provisions to those specified in this section, if all of the following conditions are met:

(a) The fugitive dust emitting process, operation, or activity is subject to either of the following:

(i) The opacity limits of subsection (2).

(ii) The spray requirements of subsection (3)(a)(i) to (v).

(b) An alternate provision shall not be established by the department unless the department is reasonably convinced of all of the following:

(i) That a fugitive dust emitting process, operation, or activity subject to the alternate provisions is in compliance or on a legally enforceable schedule of compliance with the other rules of the department.

(ii) That compliance with the provisions of this section is not technically or economically reasonable.

(iii) That reasonable measures to reduce fugitive emissions as required by this section have been implemented in accordance with or will be implemented in accordance with a schedule approved by the department.

(9) Any alternate provisions approved by the department pursuant to subsection (8) shall be submitted to the United States environmental protection agency as an amendment to the state implementation plan.

History: 1994, Act 451, Eff. Mar. 30, 1995

324.5525 Definitions.

Sec. 5525.

As used in section 5524:

(a) "Control equipment or pollution control equipment" has the meaning ascribed to control equipment in R 336.1103 of the Michigan administrative code.

(b) "Fine product" means materials which will pass through a 20-mesh screen or those particles with aerodynamic diameters of 830 microns or less.

(c) "Fugitive dust" has the meaning ascribed to it in R 336.1106 of the Michigan administrative code.

(d) "Fugitive dust source" means any fugitive dust emitting process, operation, or activity regulated under section 5524.

(e) "Opacity" has the meaning ascribed to it in R 336.1115 of the Michigan administrative code.

(f) "Particulate" means any air contaminant existing as a finely divided liquid or solid, other than uncombined water, as measured by a reference test specified in subsection (5) of R 336.2004 of the Michigan administrative code or by an equivalent or alternative method.

(g) "Potential particulate emissions" means those emissions of particulate matter expected to occur without control equipment, unless such control equipment is, aside from air pollution control requirements, vital to the production of the normal product of the source or to its normal operation. Annual potential particulate emissions shall be based on the maximum annual-rated capacity of the source, unless the source is subject to enforceable permit conditions or enforceable orders which limit the operating rate or the hours of operation or both. Enforceable agreements or permit conditions on the type or amount of materials combusted or processed shall be used in determining the potential particulate emission rate of a source.

(h) "Process" or "process equipment" has the meaning ascribed to it in R 336.1116 of the Michigan administrative code.

(i) "Silt content" means that portion, by weight, of a particulate material which will pass through a number 200 (75 micron) wire sieve as determined by the American society of testing material, test C-136-76.

(j) "Test method 9D" means the method by which visible emissions of fugitive dust shall be determined according to test method 9 as set forth in appendix A-reference methods in 40 CFR, part 60, with the following modifications:

(i) The data reduction provisions of section 2.5 of method 9 shall be based on an average of 12 consecutive readings recorded at 15-second intervals.

(ii) For roadways and parking lots, opacity observations shall be made from a position such that the observer's line of vision is approximately perpendicular to the plume direction and approximately 4 feet directly above the surface of the road or parking area from which the emissions are being generated. The observer shall not look continuously at the plume, but instead shall observe the plume momentarily at 15-second intervals at the point of maximum plume density. Consecutive readings must be suspended for any 15-second period if a vehicle is in the observer's line of sight. If this occurs, a "V" shall be used in lieu of a numerical value, and a footnote shall be made to indicate that "V" signifies that the observer's view was obstructed by a vehicle. Readings shall continue at the next 15-second period, and they shall be considered consecutive to the reading immediately preceding the 15-second period denoted by a "V". Consecutive readings also shall be suspended for any 15-second period if a vehicle passes through the area traveling in the opposite direction and creates a plume that is intermixed with the plume being read. If this occurs, an "I" shall be used in lieu of a numerical value, and a footnote shall be made to indicate that "I" signifies that the readings were terminated due to interference from intermixed plumes. Readings shall continue when, in the judgment of the observer, the plume created by the vehicle traveling in the opposite direction no longer interferes with the plume originally being read; and they shall be considered consecutive to the reading immediately preceding the 15-second period denoted by an "I". Intermixing of

plumes from vehicles traveling in the same direction represents the road conditions, and reading shall continue in the prescribed manner. A reading encompassing an unusual condition (such as a broken bag of cement on the pavement) cannot be used to represent the entire surface condition involved. In such cases, another set of readings, encompassing the average surface condition, must be conducted. For all other fugitive dust sources except roadways and parking lots, opacity observations shall be made from a position that provides the observer a clear view of the source and the fugitive dust with the sun behind the observer. A position at least 15 feet from the source is recommended. To the extent possible, the line of sight should be approximately perpendicular to the flow of fugitive dust and to the longer axis of the emissions. Opacity observations shall be made for the point of highest opacity within the fugitive dust. Since the highest opacity usually occurs immediately above or downwind of the source, the observer should normally concentrate on the area or areas of the plume close to the source.

History: 1994, Act 451, Eff. Mar. 30, 1995

PART 3. EMISSION LIMITATIONS AND PROHIBITIONS-- PARTICULATE MATTER

R 336.1301 Standards for density of emissions.

Rule 301. (1) Except as provided in subrules (2), (3), and (4) of this rule, a person shall not cause or permit to be discharged into the outer air from a process or process equipment a visible emission of a density greater than the most stringent of the following:

- (a) A 6-minute average of 20% opacity, except for 1 6-minute average per hour of not more than 27% opacity.
- (b) A limit specified by an applicable federal new source performance standard.
- (c) A limit specified as a condition of a permit to install or permit to operate.

(2) The provisions of this rule shall not apply to any process or process equipment for which fugitive visible emission limitations are specified in any other administrative rule of the department.

(3) The provisions of subrule (1) of this rule shall not apply to visible emissions due to uncombined water vapor.

(4) Upon request by the owner of a process or process equipment for which an allowable particulate emission rate is established by R 336.1331, the department may establish an alternate opacity. Such alternate opacity shall not be established by the department unless the department is reasonably convinced of all of the following:

- (a) That the process or process equipment subject to the alternate opacity is in compliance or on a legally enforceable schedule of compliance with the other rules of the department.
- (b) That compliance with the provisions of subrule (1) of this rule is not technically or economically reasonable.
- (c) That reasonable measures to reduce opacity have been implemented or will be implemented in accordance with a schedule approved by the department.

History: 1979 ACS 1, Eff. Jan. 19, 1980; 1985 MR 2, Eff. Feb. 22, 1985; 2002 MR 5, Eff. Mar. 19, 2002.

R 336.1370 Collected air contaminants.

Rule 370. (1) Collected air contaminants shall be removed as necessary to maintain the equipment at the required operating efficiency. The collection and disposal of air contaminants shall be performed in a manner so as to minimize the introduction of contaminants to the outer air.

(2) At a minimum, in priority I and II areas listed in tables 33 and 34, the use of 1 or more of the following material handling methods is required for the transport of collected air contaminants:

- (a) Enclosed trucking or transporting vehicles.
- (b) Enclosed, pneumatic, or screw conveying transporting equipment.
- (c) Water or dust suppressant sprays.
- (d) An acceptable method which is equivalent to the methods listed in subdivisions (a), (b), and (c) of this subrule.

R 336.1371 Fugitive dust control programs other than areas listed in table 36.

Rule 371. (l) Based on ambient air quality measurements or substantive complaints, the department may request that the person who is responsible for the operation of any facility which processes, uses, stores, transports, or conveys bulk materials, such as, but not limited to, coal, coke, metal ores, limestone, cement, sand, gravel, and material from air pollution control devices, or a facility which has activities specifically identified in R 336.1372 and which facility is in an area not listed in table 36, submit a fugitive dust control program. The department shall notify the person who is responsible for the operation of the facility of the provisions of R 336.1372 which apply to the facility and the reasons for the department's notification. Except as provided in subrule (3) of this rule, the control program shall be submitted to the department not later than 6 months after notification.

(2) A fugitive dust control program which is required by subrule (l) of this rule shall be in writing and shall provide for all of the following:

(a) Using l or more combinations of available technologies, operating practices, or methods listed in R 336.1372 as are reasonably necessary to control fugitive dust emissions.

(b) Consideration of the quantity, moisture content, specific gravity, and the particle size distribution of the bulk materials. The more friable, drier, lighter, and finer the bulk material is, the more effective the fugitive dust control methods incorporated into the control program shall be.

(c) The keeping and maintenance of records consistent with the various activities to be implemented under the control program.

(d) Identification of the control technologies, methods, or control equipment, if any, to be implemented or installed and the schedule, including increments of progress, for implementation or installation.

(3) Within 3 months following notification by the department that a fugitive dust control program is required, the person who is responsible for operating the facility has the opportunity to demonstrate, to the satisfaction of the department, that any part of the facility is not subject to the provisions of this rule.

(4) If a control program is not submitted within 6 months after notification by the department, then the department may proceed, pursuant to the act, toward the entry of a final order which contains a control program that meets the requirements of subrule (2) of this rule.

(5) The control program is subject to review and approval by the department. The department shall approve a control program only upon the entry of a legally enforceable order or as part of an approved permit to install or operate. If, in the opinion of the department, the program does not adequately meet the requirements set forth in subrule (2) of this rule, then the department may disapprove the program, state its reasons for disapproval, and require the preparation and submittal of an amended program within a specified time period. If, within the specified time period, an amended program is either not submitted or is submitted but, in the opinion of the department, fails to meet the requirements of subrule (2) of this rule, then the department may proceed, pursuant to the act, toward the entry of a final order which contains a control program that meets these requirements.

(6) After approval by the department, the person who is responsible for the preparation of the control program shall begin implementation of the program pursuant to the schedule contained in the control program.

(7) Either the person who is responsible for a facility or the department may request a revision to a department-approved control program to meet changing conditions. The department shall review the revision following the requirements of subrule (5) of this rule.

(8) Table 36 reads as follows:

TABLE 36

<u>County</u>	<u>Area</u>
Bay	T14N, R5E, Sections 14 to 16 and 21 to 23.
Calhoun	T2S, R4W, Section 34.
Delta	T39N, R22W, Sections 19, 30, south one-half of 17, and south one-half of 18.
Genesee	Starting on Industrial Avenue, north to Pierson Road, east to Dort Highway, south to Hitchcock Street, south to Olive Avenue (extended), south to Robert T. Longway Boulevard, west and southwest to Industrial Avenue.
Lapeer	T7N, R12E, that portion of Section 17 which lies south of M-21 and east of Fairground Road.
Macomb	T4N, R14E, Sections 27, 28, 33, and 34.
Manistee	T21N, R16W, Sections 7, 18, and 19; T21N, R17W, Sections 12 and 13.
Midland	T14N, R2E, Sections 14 to 16, 21 to 23, 26 to 28, and 33 to 35.
Monroe	Starting where Sandy Creek empties into Lake Erie, northwest to Maple Avenue (extended north-northeast), southwest to Elm Avenue, west to Herr Road, south to Dunbar Road and east to Plum Creek (which empties into Lake Erie).
Muskegon	T9N, R16W, Sections 5 and 6; T10N, R16W, Sections 21, 22, and 27 to 34.
Saginaw	Northeast section: starting on Tittabawassee Road, east to I-75, south to Wadsworth Avenue, west to I-675, west and north to Tittabawassee Road. Southwest section: T12N, R4E, the eastern half of Section 34 (that which is east of Maple Street) and Section 35.
St. Clair	T6N, R17E, Sections 2 to 4, 9 to 11, 14 to 16, 21, 22, and 28.
Wayne	Area included within the following (counter clockwise): Lake St. Clair to Moross Road to Seven Mile Road to Vandyke Road to Eight Mile Road to Wyoming Road to Seven Mile Road to Schaeffer Road to Fenkell Road to Greenfield Avenue to Joy Road to Southfield Expressway to Ford Road to Telegraph Road to Cherry Hill Road to Beech-Daly Road (extended) to Michigan Avenue to Inkster Road to Carlisle Street to Middle Belt Road to Vanborn Road to Wayne Road to Pennsylvania Road to Middle Belt Road to Sibley Road to Telegraph Road to King Road to Grange Road to Sibley Road to Jefferson Avenue to Bridge Street (Grosse Ile) extended to Detroit River. Also included is that portion of the City of Riverview which is south of Sibley Road and the City of Trenton.

History: 1979 ACS 5, Eff. Feb. 18, 1981; 1985 MR 4, Eff. Apr. 23, 1985; 2002 MR 5, Eff. Mar. 19, 2002.

R 336.1372 Fugitive dust control program; required activities; typical control methods.

Rule 372. (1) A fugitive dust control program which is required by R 336.1371 and which deals with 1 or more of the fugitive dust sources listed in this rule may include any of the typical control methods listed in this rule for that source.

(2) The following provisions apply to the loading or unloading of open storage piles of bulk materials as a source of fugitive dust:

(a) Open storage piles of bulk materials, hereinafter referred to as "piles", which meet any of the following 3 conditions need not be included in a fugitive dust control program:

(i) All piles of the same material at a manufacturing or commercial location which have a total volume of less than 100 cubic meters (131 yards³).

(ii) Any piles at a manufacturing or commercial location if the total annual volumetric throughput of all the stored material at the site is less than 10,000 cubic meters (13,100 yards³).

(iii) Any single pile at a manufacturing or commercial location that has a volume of less than 42 cubic meters (55 yards³).

(b) Typical control methods for controlling fugitive emissions resulting from the loading or unloading of piles may include, but are not limited to, the following:

(i) Completely enclosing the pile within a building furnished with department-approved air pollution control equipment.

(ii) Using pneumatic conveying or telescopic chutes.

(iii) Spraying the working surface of the pile with water or dust-suppressant compound.

(iv) Directing engine exhaust gases that are generated by the machine used on the piles for loading or unloading upwards.

(v) Minimizing the drop distance from which the material is discharged into the pile. The drop distance shall be specified in the control program.

(vi) Periodic removal of spilled material in areas within 100 meters (328 feet) from the pile. The frequency of removal shall be specified in the control program.

(3) All of the following provisions apply to the transporting of bulk materials as a source of fugitive dust:

(a) Trucks which have less than a 2-ton capacity that are used to transport sand, gravel, stones, peat, and topsoil are exempt from the provisions of this subrule.

(b) Typical control methods for controlling fugitive emissions resulting from the transporting of bulk materials by truck may include, but are not limited to, the following:

(i) Completely covering open-bodied trucks.

(ii) Cleaning the wheels and the body of each truck to remove spilled materials after the truck has been loaded.

(iii) Use of completely enclosed trucks.

(iv) Tarping the truck when operating empty if residue has not been completely removed after emptying.

(v) Cleaning the residue from the inside of the truck after emptying.

(vi) Loading trucks so that no part of the load making contact with any sideboard, side panel, or rear part of the load enclosure comes within 6 inches of the top part of the enclosure.

(vii) Maintaining tight truck bodies so that leakages within the body will be eliminated and future leakages prevented.

(viii) Spraying the material being transported in a vehicle with a dust suppressant. The frequency of spraying shall be specified in the control program.

(ix) Restricting the speed of the vehicle which transports the material. The speed of the vehicle shall be specified in the control program.

(4) The following provision applies to outdoor conveying as a source of fugitive dust: Typical control methods for controlling fugitive emissions resulting from conveying bulk materials may include, but are not limited to, the following:

(a) Completely enclosing all conveyor belts and equipping them with belt wipers and hoppers of proper size to prevent excessive spills.

(b) Enclosing transfer points and, if necessary, exhausting them to a baghouse or similar control device at all times when the conveyors are in operation.

(c) Equipping the conveyor belt with not less than 210-degree enclosures.

(d) Restricting the speed of conveyor belts. The belt speed shall be specified in the control program.

(e) Periodically cleaning the conveyor belt to remove the residual material. The frequency of cleaning shall be specified in the control program.

(f) Minimizing the distance between transfer points. The distance between transfer points shall be specified in the control program.

(g) Removing the spilled material from the ground under conveyors. The frequency of removal shall be specified in the control program.

(5) The following provisions apply to roads and lots as sources of fugitive dust:

(a) Roads and lots which are located within industrial, commercial, and government-owned facilities and which meet the following 2 conditions are not subject to the requirement of submitting a fugitive dust control program:

(i) The traffic volume is less than 10 vehicles per day on a monthly average.

(ii) The lots are less than 500 square meters (5,382 feet²) in area.

(b) Typical control methods for controlling fugitive emissions resulting from roads and lots located within industrial, commercial, and government-owned facilities may include, but are not limited to, the following:

(i) Paving roads and parking lots with a hard material, such as concrete, asphalt, or an equivalent which is approved by the department.

(ii) Mechanically cleaning paved surfaces by vacuum sweeping, wet sweeping, or flushing. The frequency of cleaning shall be specified in the control program.

(iii) Washing the wheels of every truck leaving the plant premises.

(iv) Treating the roads and lots with oil or a dust-suppressant compound which is approved by the department. The frequency of application shall be specified in the control program.

- (v) Periodically maintaining off-road surfaces with gravel where trucks have frequent access. The frequency of maintenance shall be specified in the control program.
- (6) The following provisions apply to inactive storage piles as sources of fugitive dust:
- (a) Inactive storage piles that are less than or equal to 500 cubic meters (654 yards³) in volume are not subject to the requirement of submitting a fugitive dust control program.
- (b) Typical control methods for controlling fugitive emissions resulting from inactive storage piles may include, but are not limited to, the following:
- (i) Completely covering the pile with tarpaulin or other material approved by the department.
- (ii) Completely enclosing the pile within a building.
- (iii) Enclosing the pile with not less than 3 walls so that no portion of the stored material is higher than the walls.
- (iv) Periodically spraying the piles with water or other dust-suppressant compound approved by the department. The frequency of application shall be specified in the control program.
- (v) Growing vegetation on and around the pile.
- (7) The following provisions apply to building ventilation as a source of fugitive dust:
- (a) This subrule is applicable to all of the following:
- (i) Ferrous and nonferrous foundries.
- (ii) Electric arc furnaces, blast furnace casthouses, sinter plants, and basic oxygen processes at iron and steel production facilities.
- (iii) Metal heat treating.
- (iv) Metal forging.
- (v) Bulk material handling, storage, drying, screening, and crushing.
- (vi) Metal fabricating and welding.
- (vii) Briquetting, sintering, and pelletizing operations.
- (viii) Machining and pressing of metal.
- (ix) Stone, clay, and glass production.
- (x) Lime, cement, and gypsum production.
- (xi) Chemical and allied product production.
- (xii) Asphalt and concrete mixing operations.
- (b) Typical control methods for controlling fugitive emissions resulting from building openings, such as roof monitors, powered and unpowered ventilators, doors, windows, and holes in the building structure integrity, may include, but are not limited to, the following:
- (i) Exhausting the entire building to a dust collection system which is acceptable to the department.
- (ii) Using local hoods connected to a dust collection system to capture emissions within the building.
- (iii) Establishing and maintaining operating procedures and internal housekeeping practices (specify details).

(iv) Installing removable filter media across the vent openings.

(8) The following provisions apply to fugitive dust emissions from construction, renovation, or demolition activities located in priority I areas:

(a) This subrule is applicable to the owner or prime contractor, except for those owners or prime contractors who construct, renovate, or demolish less than 12 single-family dwelling units per year.

(b) Typical control methods for controlling fugitive dust emissions from construction, renovation, or demolition activities may include, but are not limited to, the following:

(i) Spraying of all work areas with water or other dust-suppressant compound which is approved by the department.

(ii) Completely covering the debris, excavated earth, or other airborne materials with tarpaulin or any other material which is approved by the department.

(iii) Any other method acceptable to the department.

History: 1979 ACS 5, Eff. Feb. 18, 1981; 2002 MR 5, Eff. Mar. 19, 2002.

PART 9. EMISSION LIMITATIONS AND PROHIBITIONS—MISCELLANEOUS

R 336.1901 Air contaminant or water vapor, when prohibited.

Rule 901. Notwithstanding the provisions of any other department rule, a person shall not cause or permit the emission of an air contaminant or water vapor in quantities that cause, alone or in reaction with other air contaminants, either of the following:

(a) Injurious effects to human health or safety, animal life, plant life of significant economic value, or property.

(b) Unreasonable interference with the comfortable enjoyment of life and property.

History: 1979 ACS 1, Eff. Jan. 19, 1980; 2002 MR 5, Eff. Mar. 19, 2002.

APPENDIX B**SAMPLE FUGITIVE DUST PLANS****ABC QUARRY COMPANY****Conveyors and Storage Piles**

Conveyors and transfer points prior to wash screens, numbers 1 and 2, will be covered and equipped with water sprays. In addition, the drop points onto the surge pile and storage pile 21AA will be equipped with water sprays. All water sprays will be in operation while the equipment is in use. Stockpiles will be watered as follows: The 21AA storage pile will be watered five days per week, fifteen (15) minutes per day. The five remaining stockpiles will be watered three days per week, fifteen minutes (15) per day. The surge pile will not require watering. Piles will be exempt from watering on days that it rains. Piles will not be watered during the winter months or when the moisture in the pile exceeds the 6% State Highway Moisture Standard. A record of watering and rainy days will be kept on site.

Haul Roads

ABC Quarry Company will pave all haul roads that are used by trucks to remove crushed products within the quarry. Haul roads will be watered a minimum of four times a day through the use of an underground sprinkler system. Each of these four watering periods will be for a minimum of fifteen (15) minutes. A standard broom tractor will be utilized for sweeping operations. Haul roads will be watered before sweeping commences. Sweeping will take place a minimum of twice a day, more if necessary to meet opacity limits. The haul route of the loaders on the quarry floor will be watered twice each day or as needed to maintain an opacity of 5%. Watering and sweeping will not take place on rainy days. A daily log of these operations and rainy days will be kept and placed in a file on site for future reference. A ten (10) mile per hour speed limit will be posted inside the quarry limits.

Crushers and Screens

The primary crusher will be equipped with a spray bar to control emissions. Emissions from the dry screen operation and two cone crushers will be controlled by a central baghouse. All other screens are part of a wet wash system which will continually have water flowing over them when they are in use.

Blasting Emissions

To control emissions that occur as a result of blasting, ABC Quarry Company shall install two portable water cannons capable of spraying 750 gallons per minute each. The water cannons will be placed 100 feet from the center of the blast, behind and parallel from the intended blast area. The spray from these cannons shall be sufficient enough to cover the dust plume that is created when the charge is detonated. The water cannons will be activated by the plant operator, simultaneous with the detonation and will continue to spray for three minutes or until an opacity limit of 5% is achieved. Water to the cannons will be supplied from a six-inch water main that services the crushing plant. Standard fire hoses will carry the water from the plant to the cannons' positions.

Routine Maintenance

Sufficient materials, including spare hoses and bags for the baghouse, will be available on site in the event a repair is necessary to any of the emission control equipment. Bags will be inspected monthly for wear and damage and will be replaced as needed. A record of this inspection will be kept in a file on site. If for any reasons the baghouse becomes inoperable, the crushing operation will be discontinued until the baghouse is repaired.

MDEQ Inspection

These watering and sweeping procedures are subject to adjustment if, following an inspection and written notification, the Michigan Department of Environmental Quality's Air Quality Inspector finds that the fugitive dust requirements and/or the permitted opacity limits are not being met.

FUGITIVE DUST PLAN

BRECKENRIDGE SAND MINE ST. LOUIS, MI

As part of the Permit to Install Application No. 0000-00, Breckenridge Sand, Inc., has prepared the following fugitive dust plan for its sand mine located in St. Louis, Gratiot County, Michigan.

1.0 Storage Piles

As a limestone crushing operation, the facility will have storage piles of limestone of various sizes. There will be an average of six storage piles at the facility. The stone will be loaded into the piles from conveyors. The stone discharged to the piles will have been wetted in the process by the water mist sprays. Storage piles will be wetted when weather conditions are such that fugitive emissions are likely to occur, at a minimum of once per week. Wetting of the storage piles will take place through the use of a hose attached to the water tank truck. Water will be sprayed for approximately 10 to 15 minutes per pile. A log sheet will be kept that will record the pile wetting schedule. The actual moisture content of the piles is not known, but must be maintained at a level so that the product will meet the customer's specifications. Free fall from front end loaders will be minimized to 2 feet, where possible. Watering schedules will be adjusted if, after a site visit and written notification, the Michigan Department of Environmental Quality's (MDEQ) Air Quality Inspector determines that fugitive dust regulations are not being met utilizing the current schedule.

2.0 Roads and Parking Lots

The Breckenridge Sand Mine has several roads on site for vehicle access. None of the roads are currently paved. These haul roads are planned to be paved. The haul route road, for outside access to truck traffic, leads from the entrance of the facility (off of Kennedy Road) to the storage pile/loading location and back to Kennedy Road. The total length of this haul route is 0.90 miles (round trip). The first 100 feet of this road will be paved by July 31, 1996, with the rest of this road paved by October 1, 1996. Two existing customer haul road spurs for sand and clay operations are also present south of Kennedy Road. These roads are sand and stone covered and total approximately 0.4 miles. These spurs will remain unpaved, as they will eventually be excavated as part of the existing operations. An additional haul route access road ("north access road") across the main office of Breckenridge Sand, Inc.'s property exists north of Kennedy Road extending to Poplar Road. The north access road has a paved apron from Poplar Road that extends south approximately 0.1 miles. The rest of the north access road is currently unpaved. This total road length (Kennedy to Poplar Road) is approximately 0.7 miles. This road will be paved by August 1, 1997. A parking lot exists near the entrance of the facility. This unpaved parking lot covers an area of approximately 1500 square feet.

The existing sand and clay haul road spurs will be treated with a dust suppressant every five to six weeks, or as needed. These spurs will also be wetted with water from a water truck discussed below. Until they are paved, all other roads and the parking lot will be chemically treated with a dust suppressant (calcium chloride) every five to six weeks, or as needed. In addition to the dust suppressant, Breckenridge Sand, Inc. operates a water truck with a capacity of approximately 3500 gallons. Water application is through a spray bar that is 84 inches in width with six spray nozzles. Water application rate is 60 gallons per minute. During appropriate weather conditions, this truck continually travels the road and spreads water. At a minimum, it will encircle the operating areas twice per day, except on days when it rains. Records are kept of the dust suppressant application, water, and sweeping schedule.

As part of the paving for the south haul road, Breckenridge Sand, Inc. will install in-place water sprinklers. The water sprinklers will be spaced approximately every 100 feet, for a total of 20 sprinklers. Water will be supplied to the sprinklers from a 2000 gallon per minute pump. The pump will be turned on every two hours, or as needed, during the facility's operating hours and when trucks are operating on the haul road. Sprinklers will be turned on for approximately 15 minutes. A record will be kept of the sprinkler operating schedule. The north access road will be regularly serviced by the existing sweeper and water truck after it is paved. Washing of the road with the water truck and sweeper will take place a minimum of once per week, or more frequently, as needed. The watering schedule will be adjusted if, after a site visit and written notification, the MDEQ's Air Quality Division's inspector determines that fugitive dust regulations are not being met utilizing the current schedule.

Breckenridge currently has a sweeper which regularly cleans track out from the apron and paved area of the north access road. This sweeper also travels onto Poplar Road and cleans portions of that road which may be subject to track out. The sweeper operates at these locations every time it rains. Three speed control signs, limiting speeds to 25 mph, will be posted on the on-site haul road. Three additional speed control signs, limiting speeds to 25 mph, will be posted on the off-site north access road.

3.0 Conveyors and Transfer Points

Conveyors will be operated to transfer stone from the screens to the storage piles. Conveyors prior to the secondary unit will be covered to minimize fugitive emissions. Material traveling on the conveyors will have been wetted at the Stratacrawler (primary) unit, at the secondary unit, at the second secondary unit, and in the screening operation at Screen 1. Drop heights from the conveyors will be maintained at approximately two feet once the storage piles have been established. Minimum and maximum drop heights from the conveyors to the bare ground are listed in Table 1. Transfer points between conveyors and between equipment and conveyors will be minimized to reduce emissions. Transfer points located before the secondary unit will be fitted with a drop chute and rubber shrouding to minimize the drop height and fugitive emissions. As mentioned above, material will be wetted with water mist sprays at all process locations.

The Scalper Screen will be covered to minimize fugitive emissions. Additional cover material will be kept on hand should the cover rip, tear, or puncture during operations. Screen 1, used to classify material, will be wet. During the cold weather months, the water mist sprays will be drained at night to prevent freezing.

4.0 Truck Traffic

Trucks will be tarped prior to leaving the facility. Speeds on the access roads will be limited through speed control signs as described in Section 2.0. Loaded trucks leaving the facility will proceed from the site along the north access road to Poplar Road. No loaded trucks are allowed to enter Kennedy Road. Free fall of material loaded into the trucks will be minimized. Unpaved access roads will be treated with a dust suppressant every five (5) to six (6) weeks, or as necessary, and will be treated daily with water from a continually traveling water truck which supplies water at the rate of 60 gallons per minute. Spray bar for the water truck is 84 inches in width. The water tank truck will travel over the roads at least twice per day, unless it is raining. A log is kept recording the amounts of water applied, the time of application and refill, and the dates and amounts of dust suppressant applied. If necessary, the truck wheels and the hose from the tanker truck will be washed prior to exiting the facility.

Once the access and haul roads have been paved, they will be treated with water as described in Section 2.0

5.0 Crushers and Screens

The secondary and second secondary crushing mechanisms will be enclosed. The operations will also be equipped with a fabric filter dust collector. The feed to all crushers will be wetted with water mist sprays to control dust. The Stratacrawler, situated in the pit, will be well protected from wind by the excavation walls. The secondary and second secondary crushers will be situated well below grade and will thus be protected from wind by the walls of the excavation. Free fall of feed material into the primary crusher will be minimized. Although naturally wet, feed to the grizzly (primary) screen and primary crusher will be wetted with a water spray prior to processing. Free fall of material from the feed conveyors into the secondary and second secondary crusher and the screens will also be minimized.

Secondary screening operations will be wetted with water mist sprays for dust control. The Scalper Screen will be outfitted with a cover to minimize fugitive emissions. Feed to Screen 1 will be wetted with water spray nozzles to control dust. Discharge from Screen 1 will pass through a dewatering screw prior to discharge to a storage pile.

**TABLE 1
SAMPLE CONVEYOR INFORMATION DATA**

EQUIPMENT I.D.	LENGTH	DROP HEIGHT, TO BARE GROUND*	
		MINIMUM	MAXIMUM
Conveyor No. 2	100 Feet	3 ft., 6 in.	3 ft., 6 in.
Conveyor No. 2*	100 Feet	3 ft., 6 in.	3 ft., 6 in.
Conveyor No. A1	285 Feet	3 ft., 6 in.	3 ft., 6 in.
Conveyor No. A3	30 Feet	6 ft.	17 ft., 6 in.
Conveyor No. A4	80 Feet	16 ft., 5-1/4 in.	30 ft., 2-1/4 in.
Conveyor No. A5	80 Feet	16 ft., 5-1/4 in.	30 ft., 2-1/4 in.
Conveyor No B1	70 Feet	15 ft., 7/8 in.	26 ft., 11-3/8 in.
Conveyor No. B1A	80 Feet	16 ft., 5-1/4 in.	30 ft., 2-1/4 in.
Conveyor No. B4	60 Feet	13 ft., 8-1/2 in.	23 ft., 8-5/8 in.
Conveyor No. 4	30 Feet	6 ft.	17 ft., 6 in.
Conveyor No. T1	60 Feet	13 ft., 8-1/2 in.	23 ft., 8-5/8 in.
Conveyor No. T2	60 Feet	13 ft., 8-1/2 in.	23 ft., 8-5/8 in.
Conveyor No. 5	87.5 Feet	16 ft., 5-1/4 in.	30 ft., 2-1/4 in.
Conveyor No. 7	80 Feet	16 ft., 5-1/4 in.	30 ft., 2-1/4 in.
Conveyor No. 8	80 Feet	16 ft., 5-1/4 in.	30 ft., 2-1/4 in.
Conveyor No. 9	30 Feet	6 ft.	17 ft., 6 in.
Conveyor No. 10	80 Feet	16 ft., 5-1/4 in.	30 ft., 2-1/4 in.
Conveyor No. 12	80 Feet	16 ft., 5-1/4 in.	30 ft., 2-1/4 in.

* Once pile has been established, drop height will be maintained at 2 feet.

PREVENTIVE MAINTENANCE AND FUGITIVE DUST CONTROL PLANS

THE MARTIN STONE QUARRY Nowhere, Michigan

To assure proper operation of the dust control equipment Martin Stone, Inc. will institute the following preventive maintenance program at the facility:

Water Sprays on Primary

- Water sprays will be installed to minimize possible damage due to rocks.
- Repairs due to damage will take place immediately.
- Process equipment will be shut down during any scheduled maintenance or repairs. Equipment will be shut down immediately for any emergency repairs.
- The water spray system will be inspected every six (6) weeks. Routine repairs and/or maintenance will be made as needed.
- A log will be kept of the inspections on, and repairs made to, the water spray system.

Baghouses

- Spare filters for the baghouse fabric filter collectors will be kept on hand.
- Routine replacement will take place on the manufacturers recommended schedule. Emergency replacement will be warranted if it is apparent that a filter is broken due to high opacity from the fabric filter, or an obvious rip, tear, or hole is observed during a visual inspection.
- Visual inspection of the fabric filters will take place a minimum of once per month. The process units will not be operated when the fabric filter controls are being maintained or repaired.
- A log will be kept of the inspections and any maintenance or repairs to the fabric filters.

The Martin Stone Quarry has prepared the following fugitive dust plan for the Martin Stone Quarry, located in Nowhere Township, Nowhere County, Michigan.

1.0 STORAGE PILES

There will be a maximum of eight storage piles at the facility, including the surge pile. The #2 and 4 x 8 pile may be made up of three smaller piles placed together and counted as one pile. The stone will be loaded onto the piles from conveyors. Drop height will be limited to a maximum of three feet. The stone discharged to the piles will have been wetted in the process by the water mist sprays.

Storage piles will also be wetted once per day for approximately 15 minutes per pile. Water will be added to achieve 0.05 inches of precipitation across the surface area of each storage pile. Records will be kept of the water application schedule, amounts, and daily precipitation amounts.

Free fall from front end loaders will be minimized to 2 feet.

2.0 ROADS AND TRUCK TRAFFIC

All limestone transport trucks will be tarped prior to leaving the facility and a 10 mile per hour speed limit will be posted at several locations along the plant road.

All limestone transport trucks will pass through a wheel wash system prior to leaving the facility.

A street sweeper will be operated as necessary to control the carry out that may be deposited by trucks leaving the quarry. The sweepings will occur a minimum of two times per month and records will be kept on file.

Appropriate measures will be taken when necessary to minimize the emission of water onto Two Stone Road from the trailers of trucks leaving the facility. This water may be present in the bottom of trailers and results from the stone processing and particulate emission control activities.

2.1 Paved Customer Roads

The Martin Stone Quarry processing plant has four road segments that provide customer vehicle access to storage piles and the scales. They are identified on the attached map.

The segment from Two Stone Road to the scales has been paved during construction activities performed under the permit-to-install waiver.

The road segment that extends approximately 430 meters from the scales to the loading area for #4 stone will be paved by November 15, 1996.

The road segment that extends approximately 150 meters from the load out area for the #4 stone pile to the load out area for the #21A stone pile will be paved by November 15, 1996.

The road segment that extends approximately 260 meters from the scales to the loading area for wet/dry screens will be paved by November 15, 1996.

Until they are paved, these customer road segments will be wetted to maintain 0.05 inches of precipitation across the surface area of the road on an hourly basis when customer trucks are operating. Records will be kept of the water application schedule, amount, and daily precipitation amount.

The Martin Stone Quarry will install in-place water sprinklers along the paved roads. The water sprinklers will be spaced approximately every 50 feet. The sprinklers will be activated at least every hour on days when customer trucks are operating. If all of the road is not covered by the sprinkler system, the spacing between sprinklers will be decreased.

Sprinklers will be turned on until the roads are thoroughly wetted. Records will be kept of the water application schedule.

2.2 Unpaved Haul Road and Load Out Area

The haul road from the quarry pit to the primary crusher and the load out areas are not paved.

The haul road will be wetted 4.5 liters per square meter hourly each day when haul trucks are operating.

Haul truck speeds on the haul road will be limited to 10 miles per hour.

The load out areas will be wetted 4.0 liters per square meter hourly each day that front end loaders are operating.

Front end loader speeds in the load out areas will be limited to 5 miles per hour.

A log sheet will be kept that will record the wetting schedule, amount, and daily precipitation amounts.

3.0 PROCESS POINTS

Material traveling on the conveyors will be wetted at several process points. Additionally, Conveyors Nos. 1, 3, and 4 will be covered.

Transfer points will be covered.

Drop heights from the conveyors to the storage piles will be maintained at approximately three feet once the storage piles have been established.

Although naturally wet, feed to the grizzly (primary) screen and primary crusher will be wetted prior to processing.

Emissions from Crushers Nos. 2, 3, and 4, the Screen No. 1, and associated drop points will be vented through a baghouse.

Emissions from the top decks of Screens No. 2 and 3 will be vented through a second baghouse. The bottom decks and associated drops will be controlled by washing the stone.

4.0 BLASTING EMISSIONS

Reasonable measures will be taken to minimize the amount of off-site migration of airborne particulate that may be produced from a blast.

5.0 MDEQ/AQD INSPECTION

The provisions and procedures of this plan are subject to adjustment, if following an inspection and written notification, the Michigan Department of Environmental Quality's (MDEQ) Air Quality Division (AQD) finds the fugitive dust requirements and/or the permitted opacity limits are not being met.

6.0 PRECIPITATION AMOUNTS

The company will record daily precipitation amounts on site by using an MDEQ/AQD approved rain gauge. A record of these amounts will be maintained on file for a minimum of two years.

NOTES

