

Facility ID: 0514010170 Issuance type: Final State Permit To Operate

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In addition to the terms and conditions, hyperlinks have been inserted into the document so you may more readily access the section of the document you wish to review.

Finally, the term language under "Part II" and before "A. Applicable Emissions Limitations..." has been added to aid in document conversion, and was not part of the original issued permit.

THIS IS NOT AN OFFICIAL VERSION OF THE PERMIT. SEE PAGE 1 FOR ADDITIONAL INFORMATION

Facility ID: 0514010170 Emissions Unit ID: F003 Issuance type: Final State Permit To Operate

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Part II - Special Terms and Conditions

This permit document constitutes a permit-to-install issued in accordance with ORC 3704.03(F) and a permit-to-operate issued in accordance with ORC 3704.03(G).

1. For the purpose of a permit-to-install document, the emissions unit terms and conditions identified below are federally enforceable with the exception of those listed below which are enforceable under state law only.
 - (a) None.
2. For the purpose of a permit-to-operate document, the emissions unit terms and conditions identified below are enforceable under state law only with the exception of those listed below which are federally enforceable.
 - (a) None.

A. Applicable Emissions Limitations and/or Control Requirements

1. The specific operation(s), property, and/or equipment which constitute this emissions unit are listed in the following table along with the applicable rules and/or requirements and with the applicable emissions limitations and/or control measures. Emissions from this unit shall not exceed the listed limitations, and the listed control measures shall be employed. Additional applicable emissions limitations and/or control measures (if any) may be specified in narrative form following the table.

<u>Operations, Property, and/or Equipment</u>	<u>Applicable Rules/Requirements</u>	<u>Applicable Emissions Limitations/Control Measures</u>
F003 - Aggregate Storage Piles (includes loading onto piles, wind erosion, loading out and associated vehicular traffic)	OAC rule 3745-31-05(A)(3) (PTI 05-12556)	16.37 tons per year of particulate emissions (PE) See A.2.a through A.2.e. below There shall be no visible particulate emissions from storage pile and associated material handling activities, except for a period of time not to exceed one minute during any sixty-minute observation period.
	OAC rule 3745-17-07(B)(6) and OAC rule 3745-17-08(B)	None (see A.2.f)

2. Additional Terms and Conditions

- (a) The permittee shall employ best available technology on all material handling and removal activities for the purpose of ensuring compliance with the above-mentioned applicable requirements. This includes activities used to form, develop and remove material from each storage pile. In accordance with the permittee's permit application, the permittee has committed to prevent the generation of fugitive dust by minimizing the drop height of load-in and load-out vehicles. In addition, fugitive dust from loading and unloading operations will be minimized through the use of water and/or any other suitable dust suppression chemicals to ensure compliance. Nothing in this paragraph shall prohibit the permittee from employing other control measures to ensure compliance.
The above-mentioned control measure(s) shall be employed for each material handling and removal activity at each storage pile, if the permittee determines, as a result of the inspection conducted pursuant to the monitoring section of this permit, that the control measure(s) are necessary to ensure compliance with the above-mentioned applicable requirements. Any required implementation of the control measure(s) shall continue during any such operation until further observation confirms that use of the measure(s) is unnecessary.
The permittee shall employ best available technology for wind erosion from the surfaces of all storage piles for the purpose of ensuring compliance with the above-mentioned applicable requirements. In accordance with the permittee's permit application, the permittee has committed to maintain individual storage piles to a height that is as low as possible. In addition all storage piles will be established within the quarry pit to reduce the effects of wind erosion . Nothing in this paragraph shall prohibit the permittee from employing other control measures, in addition to the aforementioned practices to ensure compliance.
Implementation of the control measure(s) shall not be necessary for a storage pile that is covered with snow and/or ice or if precipitation has occurred that is sufficient for that day to ensure compliance with the above-mentioned applicable requirements.
Implementation of the above-mentioned control measures in accordance with the terms and conditions of this permit is appropriate and sufficient to satisfy the requirements of OAC rules 3745-31-05. This emission unit is not located in an "Appendix A" area as indicated in OAC rule 3745-17-08. Therefore, this emissions unit is not subject to the RACM requirements established in OAC 3745-17-08 (B) and the visible emission limitations specified in OAC rule 3745-17-07(B).

B. Operational Restrictions

1. None

C. Monitoring and/or Record Keeping Requirements

1. Except as otherwise provided in this section, the permittee shall perform inspections of the wind erosion from pile

surfaces associated with each storage pile, each day the plant is open for sale of product or is engaged in activity where the operation(s) can cause visible particulate emissions from the storage piles.

2. No inspection shall be necessary for wind erosion from the surface of a storage pile when the pile is covered with snow and/or ice and for any storage pile activity if precipitation has occurred that is sufficient for that day to ensure compliance with the above-mentioned applicable requirements. Any required inspection that is not performed due to any of the above identified events shall be performed as soon as such event(s) has (have) ended.
3. The purpose of the inspections is to determine the need for implementing the control measures specified in this permit for activities used to form, develop and remove material from each storage pile. The inspections shall be performed during representative operating conditions.
4. The permittee may, upon receipt of written approval from the Ohio EPA Southwest District Office, modify the above-mentioned inspection frequencies if operating experience indicates that less frequent inspections would be sufficient to ensure compliance with the above-mentioned applicable requirements.
5. The permittee shall maintain records of the following information:
 - a. the date and reason any required inspection was not performed, including those inspections that were not performed due to snow and/or ice cover or precipitation;
 - b. the date of each inspection where it was determined by the permittee that it was necessary to implement the control measures;
 - c. the dates the control measures were implemented; and
 - d. on a calendar quarter basis, the total number of days the control measures were implemented and, for wind erosion from pile surfaces, the total number of days where snow and/or ice cover or precipitation were sufficient to not require the control measure(s).

The information required in 5.d. shall be kept separately for (i) activities used to form, develop and remove material from each storage pile, and (ii) the pile surfaces (wind erosion), and shall be updated on a calendar quarter basis within 30 days after the end of each calendar quarter.
6. The permittee shall maintain monthly records of the total tons of sand and aggregate loaded and unloaded from the storage piles.

D. Reporting Requirements

1. The permittee shall submit deviation reports that identify any of the following occurrences:
 - a. each day during which an inspection was not performed by the required frequency, excluding an inspection which was not performed due to an exemption for snow and/or ice cover or precipitation; and
 - b. each instance when a control measure, that was to be implemented as a result of an inspection, was not implemented.

The deviation reports shall be submitted in accordance with the reporting requirements of the General Terms and Conditions of this permit.

E. Testing Requirements

1. Compliance with the emission limitations in Section A.1. of these terms and conditions shall be determined in accordance with the following method(s):
Emission Limitation:
16.37 tons per year of particulate emissions(PE)

Applicable Compliance Method:

The annual PE limitation may be determined by the following methodology:

$$\text{LIN} + \text{WE} + \text{LOT} = 16.37 \text{ tons of particulate emissions (PE)/yr}$$

where:

LIN = emissions from loading onto pile (4.21 tons of PE/yr)
 WE = emissions from wind erosion (7.95 tons of PE/yr)
 LOT = emissions from loading out of pile (4.21 tons of PE/yr)
 Aggregate load-in and load-out operation (1.5 million tpy), Emission Factor Determination: AP-42 Fifth Edition Chapter 13.2.4 (Revised 01/95)

Equation:

$$E = (k)(0.0032) [(U/5) \text{ to the power of } 1.3 / (M/2) \text{ to the power of } 1.4] \text{ pounds of PE per ton}$$

Where:
 k = particle size multiplier (TSP30 = 0.74);
 U = mean wind speed (mph); and
 M = material moisture content (%).

Mean Wind Speed: The thirty-year annual wind speed for selected Ohio cities is 10.2 mph for the Dayton Area. The maximum mean wind speed is given as 11.0 mph for the Mansfield area (RACM, Table 2.1.2-3). Martin Marietta Materials uses the value of 12 mph as a safety value (11.0 mph + 1 mph);
 U = mean wind speed (mph) = 12 mph (approximate for southwestern Ohio); and
 Material Moisture Content: The material moisture content range is given as 0.25% to 4.8% (AP-42, 13.2.4-3). The representative moisture content for Limestone is 2%. as a worst-case scenario, Martin Marietta Materials

will use the value of 2% as listed in RACM, Table 2.1.2-2.

M = material moisture content = 2% (worst-case based on limestone material per RACM, Table 2.1.2-2).

Emission Factor Calculation:

The following calculations represent the emission factors for total suspended particulate for aggregate handling at this Limestone plant:

TSP (PM30) Emission Factor ETSP = $(0.74)(0.0032)[(12/5) \text{ to the power of } 1.33 / (2/2) \text{ to the power of } 1.4] = 0.007 \text{ lb/ton grvl.}$

Maximum Amount of Aggregate Handled: The maximum amount of aggregate produced at the facility is 1,500,000 tons of limestone annually. This value is based on the maximum amount of aggregate that the facility can produce.

Maximum Material Handled to the Storage Piles: 1,500,000 tons/yr
Maximum Material Handled to Truck Loading: 1,500,000 tons/yr

Maximum Uncontrolled Particulate Emissions for Aggregate Handling and Storage Piles

Material Load-in Operation (Loading to Storage Piles)

TSP (PM30) Maximum Emissions = $(0.007 \text{ lb/ton})(1,500,000 \text{ ton/yr})/2000 = 5.62 \text{ ton/yr}$

Material Load-out Operation (Storage Piles => Gravel Trucks)

TSP (PM30) Maximum Emissions = $(0.007 \text{ lb/ton})(1,500,000 \text{ ton/yr})/2000 = 5.62 \text{ ton/yr}$

Total TSP (PM30) Maximum Uncontrolled Emissions = 11.24 ton/yr

Load-in/Load-out Control Measures:

There are several control methods available to effectively minimize fugitive dust emissions generated from storage pile activities. The primary control measures are enclosures, chemical stabilization, and operating precautions. Typical operating precautions include minimizing the drop heights of the stackers and front-end loaders. Aggregate materials have a natural inherent moisture content that allows for the implementation of operating precautions as an effective control measure.

Implementation of Operating Precaution: 25% average control efficiency (RACM, 1980, Ohio EPA)

Total Maximum Controlled Particulate Emissions for Aggregate Handling and Storage Piles

TSP (PM30) Maximum Emissions = $(11.24 \text{ ton TSP/yr})(1-0.25)/2000 = 8.43 \text{ ton/yr}$

Wind erosion- maximum emission calculations:

The emission factor is taken from "Control of Open Fugitive Dust Sources", USEPA (EPA-450/3-88-008).

$E = (1.7)(s/1.5)((365 - p)/235)(f/15) = \text{lbs/day/acre}$ (Equation (1))

$E = (1.7/24)(s/1.5)((365-p)/235)(f/15) = \text{lbs/hr/acre}$ (Equation (2))

Where:

s = material silt content (%);

p = number of days with at least 0.01 inches of precipitation per year; and

f = percent of time where the wind is greater than 12 mph.

Material Silt Content:

AP-42, Table 13.2.4-3 provides a silt content range of 0.44% to 19% in the development of the Aggregate Handling and Storage Pile equation. RACM lists limestone as 2%, and AP-42 lists "various limestone products" as a mean value of 3.9%. As a worst-case scenario, Martin Marietta Materials will use the mean silt content value of 3.9%. (AP-42, Table 13.2.4-1).

s = material silt content is 3.9% (AP-42, Table 13.2.4-1 "Mean Value" as a worst-case scenario.

Mean Wind Speed:

The above equation calls for the percent of time where the wind is greater than the Mean Wind Speed. The Mean Wind Speed, as discussed previously, is 12 mph (11 mph - Mansfield area + 1 mph - Safety Factor) as a worst-case scenario. Historically, Martin Marietta Materials uses the value of 23% as the "percent of time where the wind is greater than the Mean Wind Speed".

f = percent of time where the wind is greater than 12 mph = 23%

Number of Days with at least 0.01 inch of Precipitation per Year:

The mean number of day with at least 0.01 inch of precipitation per year is based on AP-42, Figure 13.2.2-1 and provides a value of 130 days for the western portion of Ohio.

p = mean number of days with at least 0.01 inch of precipitation per year = 130 days (AP-42, Figure 13.2.2-1)

Emission Factor Determination:

The following calculations represent the emission factors for total suspended particulate for wind erosion:

TSP (PM30) Emission Factor ETSP = $(1.7/24)(3.9/1.5)((365-130)/235)(23/15) = 0.28 \text{ lb/hr/acre}$

Maximum Amount of Limestone Storage - Maximum Uncontrolled Wind Erosion Emissions:

The maximum amount of Limestone produced at the facility is 1,500,000 tons annually. This value is based on the maximum amount of aggregate that the facility can produce although product types will vary based on customer demand. The storage piles are assumed, as a worst-case scenario, to be created by radial stackers.

Radial stackers typically can rotate to create a maximum 120 degree arc. Stacker heights are typically designed to be a maximum height of 50 feet.

TSP (PM30) = $[(0.28 \text{ lb/hr/acre})(24 \text{ hr/day})(13.12 \text{ acres})(365 \text{ days/yr})]/2000 = 16.23 \text{ ton/yr}$

Wind Erosion Emission Control Measures:

Due to the naturally occurring moisture content of the storage pile material, it is practical and feasible to maintain the heights of the storage piles. This type of control measure is defined as "Precautionary Measures"

in RACM and estimates an average control efficiency of 30% (RACM, 1980, pg. 2-48). The facility's ODNR Mining Permit requires the installation of berms. In addition, the processing plant (and storage piles) will be located 11 feet below the natural elevation. Combined, this provides a "wind break" of approximately 50 feet in height and an additional average control efficiency of 30% (RACM, 1980, pg. 2-48).

Therefore the average control efficiency, achieved by calculating a ratio of emissions controlled per uncontrolled emissions is 51%.

Maximum Controlled Particulate Emissions for Wind Erosion:

$TSP (PM_{10}) = [(0.28 \text{ lb/hr/acre})(24 \text{ hr/day})(13.12 \text{ acres})(365 \text{ days/yr})(1-0.51)]/2000 = 7.95 \text{ ton/yr.}$

There shall be no visible particulate emissions from the storage piles and associated material handling activities, except for a period of time not to exceed one minute during any sixty-minute observation period.

Applicable Compliance Method

Compliance with the visible emission limitations for the storage piles identified above shall be determined in accordance with Test Method 22 as set forth in "Appendix on Test Methods" in 40 CFR, Part 60 ("Standards of Performance for New Stationary Sources"), as such Appendix existed on July 1, 1996, and the modifications listed in paragraphs (B)(4)(a) through (B)(4)(c) of OAC rule 3745-17-03.

F. Miscellaneous Requirements

1. None