

**Permit Boilerplate Procedures for Stone Processing Operations APG-558**

*Date: September 6, 2018*

**I. PURPOSE**

The purpose of this document is to provide guidelines for the Department of Environmental Quality (DEQ) when developing a minor new source review (NSR) permit using the stone processing conditions document (“boilerplate”) and emission spreadsheets<sup>1</sup>. Please refer to DEQ’s Guidance APG 354: Permitting and BACT Applicability under Chapter 80 Article 6 for minor NSR permitting applicability. More stringent requirements may be imposed if necessary to demonstrate compliance with the National Ambient Air Quality Standards (NAAQS) or other special requirements.

These procedures do not apply to stone processing plants subject to Prevention of Significant Deterioration (PSD), Nonattainment or state major permit reviews as these types of permits require additional analyses and extensive public participation. These procedures do not cover all emission units that may be found at stone processing plants (e.g. stationary internal combustion engines, storage silos, fuel storage tanks, boilers etc.). Any such units should be evaluated on a case-by-case basis using other boilerplates or guidance as appropriate.

**II. DEFINITIONS**

The following definitions are for use in this permit boilerplate and procedure and do not necessarily have the same meaning in other portions of the regulations:

Affected Facility	<p>Affected facilities are subject to the provisions of NSPS Subpart OOO, <u>Standards of Performance for Nonmetallic Mineral Processing Plants</u>, which includes: nonmetallic mineral processing facilities in fixed or portable plants constructed, modified, or reconstructed after August 31, 1983 which includes: each crusher, grinding mill, screening operation, belt conveyor, bucket elevator, bagging operation, storage bin, enclosed truck or railcar loading station. For example, a unit that was constructed prior to 9-1-83 but installed after 8-31-83 is not considered an affected facility and would not be subject to NSPS OOO. <u>Please note, the stationary source must include a crusher (common control and same SIC number) for the emissions units to be subject to NSPS Subpart OOO.</u></p> <p>Following are not subject to NSPS OOO and hence not affected facilities:</p> <ul style="list-style-type: none"><li>All facilities located in underground mines</li><li>Wet material processing operations</li><li>Fixed sand and gravel plants and crushed stone plants with capacities of 25 tons per hour or less</li><li>Portable sand and gravel plants and crushed stone plants with</li></ul>
-------------------	---

<sup>1</sup> Owners of the Stone Processing Plant may apply for coverage under the Nonmetallic Mineral Processing General Permit (NMMGP) instead of obtaining individual minor NSR permit if the Plant meets the applicability criteria and other requirements specified in 9 VAC 5 Chapter 510. The Spreadsheet (Aggregate Processing Emission Calculation) to be submitted as part of NMMGP Application Statement is provided in separate document.

capacities of 150 tons per hour or less

Storage silos that handle cement or lime

Air Classifier	Air classifiers (also called air separators) are used to separate dry, extremely fine (420 microns to 44 microns) particles. The classifiers have an internal fan that generates an upward airflow that lifts the extremely fine particles, while allowing the larger particles to drop. The classifier has a double wall construction that allows the two products to remain separate for further processing. The air is recirculated inside the classifier, but there is some air leakage to the atmosphere. The particulate emissions from the classifier may be considered nil. A classifier may be a NSPS affected facility when used in conjunction with a fines mill (or crusher) or grinding mill.
Primary Crusher	Initial crushing of quarry stone normally introduced to the first crusher (jaw, gyratory, etc) to yield an approximate 5" to 6" product. Primary crushing includes the truck dumping, feeder, and discharge emissions.
Secondary Crusher	Reduction of a sized product normally introduced to a crusher to yield an approximate 1" to 3" product. Includes feeder and discharge emissions.
Tertiary Crushing	Reduction of screened product normally introduced to a crusher to yield an approximate 1" or less product. Includes feeder and discharge emissions. Tertiary cone crushers are normally considered totally enclosed by being choke fed in addition to the enclosed discharge chute for spillage control. Normal hourly and annual throughputs often exceed primary throughput due to recirculating load
Feed Hopper	A bin that is fed either by a truck dumping or front end loader. The feed hoppers or truck dump hoppers are not subject to the provisions of NSPS Subpart OOO per 40 CFR 60.672(d). However, construction of feed hoppers may require a minor NSR permit
Fines Mill	Reduction of screened product normally introduced to a ball mill, hammermill, or other types of crusher to yield a powder product such as agricultural lime or manufactured sand. Fines mill products can be characterized as having 80% (wt) passing through a 4 Mesh test screen (~0.20 inch). Includes feeder and discharge emissions. May have high hourly and annual throughputs due to recirculating load. When the fines mill circuit includes an air classifier, cyclone, and pneumatic conveying equipment, the particulate emissions are included in the fines mill emission factor.
Grizzlies	A specialized screening device used to remove undersize material prior to crushing or in the separation of large stone fractions (<3") to produce a salable product such as riprap. This device normally consists of uniformly spaced parallel steel bars that allow fine material to fall through the steel bars. Grizzlies may be either static

	<p>or powered. The grizzly's particulate emissions have been included in the primary crusher's emission factors. When grizzlies are used as screens, they are subject to NSPS Subpart OOO. Use truck unloading-fragmented stone emission factors for screening large rock (i.e. riprap). Grizzly feeders associated with truck dumping and static (non-moving) grizzlies used anywhere in the nonmetallic mineral processing plant are not considered to be screening operations and are not subject to NSPS Subpart OOO.</p>
Load-Out	<p>Finished stone product transfer to trucks/rail cars. May be used to calculate emissions from loading feed hoppers for wash plants, pugmills, etc. Loading of open trucks and railcars via belt conveyor, storage bin, front end loader, etc. is not subject to NSPS Subpart OOO, but State regulations do apply. Loading of enclosed trucks and railcars is subject to NSPS Subpart OOO.</p>
Pugmill Plant	<p>Usually consisting of several feed hoppers, a belt conveyor, a cement silo, and a pugmill mixer. The pugmill is used to blend fine and coarse stone products into a homogeneous mixture with a high moisture content. The last belt conveyor feeding the pugmill mixer is the last emission point at this operation. The purpose of the pugmill is to mix different sizes of aggregates and water to achieve a specified moisture content (5% to 10% by wt.) and gradation profile.</p> <p>Pug Mills are permit exempt, when defined as a process involving an enclosed drum to internally mix (with water) aggregate size to a uniform consistency. Pugmills are not listed as affected facilities in 40 CFR 60.670(a) and are not subject to NSPS Subpart OOO.</p> <p>Emissions from the pugmill are considered negligible.</p>
Reclaiming	<p>Automated stockpile stone recovery belt conveyor system, usually located in a tunnel. Emissions are negligible.</p>
Screening	<p>Sizing separation of received or crushed stone product. Screening includes emissions from the feed conveyor, product bins located under the screens, and product discharge chutes. Tertiary screens often have higher hourly and annual throughputs that exceed primary throughput due to recirculating loads. Fines screen products can be characterized as having 80% (wt) passing through a 4 Mesh test screen (~0.20 inch).</p>
Storage	<p>Product reserve of crushed stone. Usually stored in open piles. Storage emissions generally calculated at 25% to 40% of primary throughput, since the larger size stone products have less 100 micron size particles by weight than other stone products and are washed to remove 100 micron particles. Emissions include product drop emissions from belt conveyors and/or stock trucks, and haul road emissions. Higher truck activity and miles of haul roads within the quarry will result in increased emissions. If not specified by source, use 33% of primary annual throughput.</p>

Transfer Point	Stone product transfer directly from one conveyor or bucket elevator to another conveyor or bucket elevator.
Surge Bins	Temporarily store stone products (conveyor - bin - conveyor) in order to balance production capacity of different processing equipment. Using twice the conveyor transfer emission factors accounts for loading and discharge from the surge bin.
Unload	Discharge of stone from a vehicle. These emissions have been included in the storage pile and loadout emission factors. However, these emissions may be used in specialized cases (riprap plants, etc.).
Wet Material Processing Operations or Wash Plant	Used to remove the unwanted materials (minus 200 mesh/74 micron particles, dirt, clay, etc) from stone products. The wash plant usually consists of feed hoppers, belt conveyors, a screen, and possibly a sand classifier. The screen has permanently mounted spray bars capable of discharging hundreds of gallons/minute of water that completely saturates the stone and removes the unwanted material from the stone product. The belt conveyor that feeds the wash screen is the last emission point for this type of operation. <b>Subpart OOO exempts the wet material processing operations (wash screen and all downstream production equipment, up to the next crusher or storage bin in the production line).</b>
Enclosure	<p>Enclosure is a control mechanism. Enclosures frequently used for maintenance, noise abatement, weather proofing, etc. are not to be confused with enclosures built for air pollution control.</p> <p>Partial enclosure (significantly restricts air flow): 70% efficient (dry basis) [example: hooded transfer]</p> <p>Enclosure (completely restricts air flow while allowing opening for material flow): 90% efficient (dry basis) [example: enclosed screening deck unit or fines mill]</p>

### III. APPLICABILITY:

This boilerplate applies to the construction of any source or any project (which includes any addition or replacement of an emissions unit, any modification to an emissions unit or any combination of these changes) of stone processing plants as stated in Section I of these procedures.

- A. **Existing Source Rule 4-14 Emission Standards for Sand and Gravel Processing Operations and Stone Quarrying and Processing Operations** – The limits on the stone processing plant cannot be less stringent than Rule 4-14.
- B. **MACT and State Toxics** – There are no applicable MACTs for stone processing plants. State toxics review is also not required.
- C. **Modeling** - Modeling is not normally required. Please contact Central Office modeling staff if on a case-by-case basis modeling is needed.
- D. **NSPS, Subpart OOO - Standards of Performance for Nonmetallic Mineral Processing Plants**

<http://www.ecfr.gov/cgi-bin/text-idx?SID=0907dcfe3a4b5369128ce69295b432ff&mc=true&node=sp40.7.60.ooo&rgn=div6>

Affected facilities are subject to the provisions of NSPS Subpart OOO, Standards of Performance for Nonmetallic Mineral Processing Plants. See the definition of “Affected Facilities” in Section II. The latest amendment to Subpart OOO was effective on April 28, 2009. These amendments include revisions to the emission limits for NMPP affected facilities which commence construction, modification, or reconstruction on or after April 22, 2008. These amendments for NMPP also include: additional testing and monitoring requirements for affected facilities that commence construction, modification, or reconstruction on or after April 22, 2008; exemption of affected facilities that process wet material from this final rule; changes to simplify the notification requirements for all affected facilities; and changes to definitions and various clarifications. The summary of amendments to Subpart OOO is summarized in Table 1 of the background document which can be accessed at:

[http://www.epa.gov/ttn/oarpg/t1/fr\\_notices/nmpp\\_nsps\\_fr\\_041609.pdf](http://www.epa.gov/ttn/oarpg/t1/fr_notices/nmpp_nsps_fr_041609.pdf)

NSPS Subpart OOO emission limitations, monitoring requirements, performance test, notification and reporting requirements for facilities which use baghouse or wet suppression are summarized below. *Please refer to Subpart OOO for requirements for affected facilities which do not use wet suppression or baghouse.*

1. NSPS Emission Controls -

Subpart OOO does not specify that any particular control technology be used. Rather, Subpart OOO specifies emissions limits that must be met by affected facilities. Affected facilities can meet the Subpart OOO emission limits using whatever mechanisms they choose (e.g., wet suppression water sprays, etc.).

2. NSPS Emission Limitations –

For affected facilities that commenced construction, modification, or reconstruction after August 31, 1983 but before April 22, 2008:

**Table 1: After August 31, 1983 but Before April 22, 2008**

Affected Facility*	Pollutant	Emission Limit
Affected facilities with dry capture systems (i.e., baghouse) except for a system that controls only an individual enclosed storage bin	PM	0.022 gr/dscf
Affected facilities with dry capture systems (i.e., baghouse)	Visible emissions	7% opacity
Crushers	Visible emissions	15% opacity
Fugitive emissions from conveyor belts, screening operations, and other affected facilities	Visible emissions	10% opacity

\*If an affected facility is enclosed in a building, the affected facility must comply with the limits listed above OR the building enclosing the affected facilities must comply with a visible emissions limit of 7 percent opacity from the building openings (except for vents as defined in 60.671) and a particulate emission limit of 0.022 gr/dscf from the vents.

For affected facilities that commenced construction, modification, or reconstruction on or after April 22, 2008:

**Table 2: After April 22, 2008**

Affected Facility*	Pollutant	Emission Limit
Affected facilities with dry capture systems (i.e., baghouse) except for a system that controls only an individual enclosed storage bin	PM	0.014 gr/dscf
Dry capture system installed only on an individual enclosed storage bin	Visible emissions	7% opacity
Crushers	Visible emissions	12% opacity
Fugitive emissions from conveyor belts, screening operations, and other affected facilities	Visible emissions	7% opacity

\*If an affected facility is enclosed in a building, the affected facility must comply with the limits listed above OR the building enclosing the affected facilities must comply with a visible emissions limit of 7 percent opacity from the building openings (except for vents as defined in 60.671) and a particulate emission limit of 0.014 grains per dry standard cubic foot from the vents.

3. NSPS Performance Tests -

Initial Performance Test – The following initial performance tests shall be conducted:

**Table 3: Initial Performance Tests**

Affected Facility	Pollutant	Test Method
Affected facilities with dry capture systems (i.e., baghouse) and vents from a building that encloses affected facilities (except for a system that controls only an individual enclosed storage bin)	PM	Method 5 or 17***
Affected facilities with dry capture system and a building that encloses affected facilities*	Visible emissions	Method 9
Fugitive emissions from crushers, conveyor belts, screening operations, and other affected facilities**	Visible emissions	Method 9

\*When determining compliance with the visible emissions limit for a dry capture system (i.e., baghouse) that controls an individual enclosed storage bin, the duration of the Method 9 test shall be 1 hour (ten 6-minute averages).

\*\*When determining compliance with the visible emissions limit from fugitive emissions from crushers, conveyor belts, screening operations, and other affected facilities (as described in 60.672(b) or 60.672(e)(1)), the duration of the Method 9 test must be 30 minutes (five 6-minute averages).

\*\*\*Method 5I may be used as an alternative. Method 5I may be useful for affected facilities that operate for less than 1 hour at a time such as (but not limited to) storage bins or enclosed truck or railcar loading stations.

- If a building encloses affected facilities that commenced construction, modification, or reconstruction on or after April 22, 2008, the Permittee must conduct an initial Method 9 performance test.
- If a building encloses only affected facilities that commenced construction, modification, or reconstruction before April 22, 2008 and the Permittee has previously conducted an initial Method 22 performance test showing zero visible emissions, then the permittee has demonstrated compliance with the opacity limit. If the permittee has not conducted an initial performance test for the building before April 22, 2008, then the permittee must conduct an initial Method 9 to show compliance with the opacity limit.

Repeat Performance Test - A repeat performance test shall be conducted for compliance with fugitive visible emissions limits within 5 years from the previous performance test from affected facilities without water sprays. Affected facilities controlled by water carryover from upstream water sprays that are inspected according to the requirements in §60.674(b) and §60.676(b) are exempt from this 5-year repeat testing requirement.

4. NSPS Monitoring Requirements -

- a. For any affected facility that commenced construction, modification, or reconstruction on or after April 22, 2008 that uses wet suppression to control emissions, the Permittee shall:
- (1) Perform monthly periodic inspections to check that water is flowing to discharge spray nozzles in the wet suppression systems.
  - (2) Initiate corrective action within 24 hours and complete corrective action as expediently as practical if the Permittee finds that water is not flowing properly during an inspection of the water spray nozzles.
  - (3) If an affected facility relies on water carryover from upstream water sprays to control fugitive emissions, then that affected facility is exempt from the 5-year repeat testing requirement specified in Table 3 of 40 CFR 60 Subpart OOO provided that the affected facility meets the criteria listed below:
    - (a) The permittee conducts periodic inspections of the upstream water spray(s) that are responsible for controlling fugitive emissions from the affected facility. These inspections are conducted according to §60.676(b), and
    - (b) The owner or operator of the affected facility designates which upstream water spray(s) will be periodically inspected at the time of the initial performance test required.
- b. For any affected facility that commenced construction, modification, or reconstruction on or after April 22, 2008 that is controlled with a baghouse, the Permittee shall:
- (1) Conduct quarterly visible emissions inspections using EPA Method 22 while the baghouse is in operation. If any visible emissions are observed, the Permittee must initiate corrective action within 24 hours to return the baghouse to normal operation.

OR

- (2) Install, operate, and maintain a bag leak detection system according to specifications and requirements listed in 40 CFR 60.674(d)(1). The Permittee must develop and submit for approval a site-specific monitoring plan for each bag leak detection system. The Permittee must operate and maintain the bag leak detection system according to the approved site-specific monitoring plan at all times. The Permittee must initiate procedures to determine the cause of an alarm within 1 hour of the alarm. The cause of the alarm must be alleviated within 3 hours of the alarm by taking any corrective action necessary.



5. NSPS Notification Requirements -

Notifications and reports required under Subpart OOO and under Subpart A to demonstrate compliance with Subpart OOO need only to be sent to DEQ. EPA notification is not required (40 CFR 60.676 (k)).

6. NSPS Recordkeeping Requirements – The following recordkeeping requirements shall apply:

- a. For any affected facility that commenced construction, modification, or reconstruction on or after April 22, 2008 that uses wet suppression to control emissions, the Permittee shall keep records of:
  - (1) Each inspection of the water spray nozzles, including the date of each inspection and any corrective actions taken, shall be recorded in a logbook (in written or electronic form). The logbooks (in written or electronic form) shall be maintained on-site and made available to DEQ personnel upon request.
  - (2) If an affected facility that routinely uses wet suppression water sprays ceases operation of the water sprays, or is using a control mechanism to reduce fugitive emissions other than water sprays during the monthly inspection (for example, water from recent rainfall), the logbook entry required must specify the control mechanism being used instead of the water sprays.
- b. For any affected facility that commenced construction, modification, or reconstruction on or after April 22, 2008 that is controlled with a baghouse, the Permittee shall keep records of:
  - (1) Each quarterly Method 22, including the date, results of the observation, and any corrective actions taken, shall be recorded in a logbook (in written or electronic form).
  - (2) For each bag leak detection system, records of the system output, any system adjustments (including the date and time of the adjustment, the initial system settings, and the final system settings) and information pertaining to all system alarms (including the date and time of the alarm, the time that procedures to determine the cause of the alarm were initiated, the cause of the alarm, an explanation of the actions taken, the date and time the cause of the alarm was alleviated, and whether the cause of the alarm was alleviated within 3 hours of the alarm) shall be recorded in a logbook (in written or electronic form). The logbooks (in written or electronic form) shall be maintained on-site and made available to DEQ personnel upon request.

#### **IV. EMISSION LIMITS/CALCULATIONS:**

The primary pollutant from a stone processing plant is particulate matter (PM, PM-10 and PM-2.5). The attached spreadsheet (Attachment) can be used to calculate emissions from all of the contributing processes at a stone processing facility. The emission factors used in the spreadsheet and the procedures for using it to calculate emissions are described in Section VIII.

#### **V. EMISSION CONTROLS AND BACT UNDER ARTICLE 6:**

Listed below are the conditions/emission limits that are considered Best Available Control Technology (BACT) for a stone processing plant.

- Fugitive emissions from handling, drills, shot piles, screens, traffic areas, load-outs and other dust sources shall be controlled by wet suppression or equivalent as approved by DEQ.
- Fugitive emissions from crushing shall be controlled by the use of wet suppression and/or reducing the free fall distance of materials at transfer points and/or enclosing the conveyor drop points with venting of particulate emissions to a fabric filter.
- Application of asphalt, water, or suitable chemicals on dirt roads, materials stockpiles, and other surfaces which may create airborne dust; paving of roadways, and maintenance of roadways in a clean condition.
- Affected facilities shall meet emission limits specified in Subpart OOO. Subpart OOO does not specify that any particular control technology be used. Rather, Subpart OOO specifies emissions limits that must be met by affected facilities. Affected facilities can meet the Subpart OOO emission limits using whatever mechanisms they choose (e.g., wet suppression water sprays, etc.).

#### **VI. EQUIPMENT REPLACEMENT**

##### **A. NSPS Subpart OOO Requirements:**

When an existing facility is replaced by a piece of equipment of equal or smaller size having the same function as the existing facility, and there is no increase in the amount of emissions, the new facility is exempt from the provisions of 40 CFR 60.672 (Standard for particulate matter), 60.674 (Monitoring), and 60.675 (Stack testing) except as provided for in 60.670(d)(3). The Permittee shall comply with the reporting requirements of 40 CFR 60.676(a) as listed below.

If all the existing facilities in a production line are replaced by new facilities, then new facilities do not qualify for the provisions of 40 CFR 60.672 (Standard for particulate matter), 60.674 (Monitoring), and 60.675 (Stack testing), as per 60.670 (d)(3).

##### **B. 60.676 (a) – Reporting requirements for NSPS Like-For-Like Replacement.**

A Permittee seeking to comply with §60.670(d) (i.e., seeking exemption from the provisions of 40 CFR 60.672 (Standard for particulate matter), 60.674 (Monitoring), and 60.675 (Stack Testing)) shall submit to DEQ the following information about the existing facility being replaced and the replacement piece of equipment.

1. For a crusher, grinding mill, bucket elevator, bagging operation, or enclosed truck or railcar loading station:
  - a. The rated capacity in megagrams or tons per hour of the existing facility being replaced, and
  - b. The rated capacity in tons per hour of the replacement equipment.
2. For a screening operation:
  - a. The total surface area of the top screen of the existing screening operation being replaced, and
  - b. The total surface area of the top screen of the replacement screening operation.
3. For a conveyor belt:
  - a. The width of the existing belt being replaced, and
  - b. The width of the replacement conveyor belt.
4. For a storage bin:
  - a. The rated capacity in megagrams or tons of the existing storage bin being replaced, and
  - b. The rated capacity in megagrams or tons of replacement storage bins.

**C. Minor NSR Permitting Requirements:**

Minor NSR permitting applicability for replacement emission units (either NSPS or non-NSPS) will be evaluated as per procedures described in DEQ's Guidance APG 354: Permitting and BACT Applicability under Chapter 80.

**VII. NOTIFICATION FOR RELOCATION OF PORTABLE FACILITIES**

Stone Processing plants may be permitted as portable facilities. The portable plant relocation conditions and form letters have not been included in this boilerplate but should be included in the permit if the applicant requests that the facility be permitted as a portable plant. Copies of the portable plant permit conditions and form letters for notification of relocation can be found in the Minor NSR Boilerplate Directory on DEQNET.

## VIII. EMISSIONS CALCULATIONS

### VIRGINIA EMISSIONS SPREADSHEET

FOR  
  
AGGREGATE PRODUCING FACILITIES  
  
GUIDANCE DOCUMENT  
&  
EXAMPLE EMISSIONS CALCULATIONS  
for Version 4.0

### INTRODUCTION

The emissions spreadsheet (version 1.1 dated September 1, 1995) was developed through a cooperative effort by the Virginia Department of Environmental Quality (DEQ) and the Virginia Aggregates Association (VAA). The current version (v4.0) of the spreadsheet was subsequently updated to include the emission factors for PM<sub>2.5</sub>. This spreadsheet should accurately calculate emissions from all of the contributing processes at an aggregate processing facility. Every effort has been made to eliminate errors in the spreadsheet and this guidance document; however, neither the VAA nor DEQ warrant the accuracy of the information contained therein. This spreadsheet will calculate actual emissions, potential emissions, uncontrolled emissions and General Permit potential emissions.

The emissions spreadsheet and this guidance document must be used in conjunction with the Stone Processing Plant Air Permit Boilerplate and Stone Processing Plant Procedures Document. Many of the terms used here and on the spreadsheet are defined in the other two documents. For brevity, no attempt has been made to duplicate here the information found in these other documents.

**PROCESS FLOW DIAGRAM**

In order to determine accurate actual process flow amounts (tph) for each item a current flow diagram for the plant must be used. This flow diagram should show the location of all crushers, screens, conveyors, bins, stockpiles and truck loadout areas. Some type of facility specific ID# should be shown for each item. This ID# can be in the form of a company number, serial number, flow diagram ID number or plant number. **The Stone Processing tab of the spreadsheet should be used for all input.**

If a wash plant is located in this facility, all of the items that process this wet material should be clearly identified. These items will not contribute emissions to the facility totals but still should be entered into the spreadsheet.

The Stone Processing Plant should be broken into the major components (Main Plant, Sand Plant, Wash Plant, Pug Mill Plant, etc). Each of the major components should be run separately using the spreadsheet. The permit should limit the throughput for each major component in a manner that is agreeable with the Agency and the Source. List the emissions per current Agency procedures.

**ACTUAL PROCESS RATES**

	PROCESS ID#
	Actual Processed (t/yr)
	Rated Capacity (t/hr)
	Allowable (t/yr)

In order to determine the actual emissions generated by the plant, the actual process flow rate must be determined for each item in the plant. Most plants keep an accurate record of the tons of aggregate delivered to the primary plant from the pit. This annual amount of aggregate is then processed through the plant in some normal flow pattern that is determined by the desired end products. For permit modifications or new constructions, the actual process throughput should be equal to the allowable throughput. One possible exception is the pugmill/cement silo - see the NOTE below.

One method for determining the actual amount handled by each item is to calculate the percentage of shipments that occurs from each stockpile. This percentage of shipments can be directly related to percentage of production when applied to an extended period of time. For example, if base material accounted for 45% of the shipments for the year it is safe to assume that 45% of the total production ended up at the base material stockpile. The total throughput should then be multiplied by this percentage to determine the annual tonnage amount that was processed to a particular stockpile. Using this method it is not difficult to back track values from the stockpiles through the plant. Also, general knowledge of the percent split from the primary to the secondary to the wash plant is also helpful.

Once this actual annual amount has been determined for each item, the information can be shown on the flow diagram for input into the spreadsheet.

NOTE: For cement silos, you will have to calculate the tons of cement, not aggregate, processed annually. The emission factors shown on the spreadsheet include both pneumatic loading of the silo and eventual unloading of the cement into the product (cement treated aggregate).

**RATED CAPACITY**

	PROCESS ID#
	Actual Processed (t/yr)
	Rated Capacity (t/hr)
	Allowable (t/yr)

The rated capacity for each item can be determined from the permit limits or from information available from the manufacturer. If your permit issued by Virginia DEQ lists an hourly restriction for items in the plant this amount should be entered into the spreadsheet as the capacity for that item. If only the crushers and screens have capacity restrictions in the permit, the capacities of the additional items in the plant can be determined by the same flow pattern used in the actual calculations. For example, if screen #3 has a permit restriction of 300 tph and the items downstream in the plant are not included in the permit, this 300 tph would be distributed in a normal flow pattern on these remaining items. These flow amounts would be the restrictions for these additional items based on the fact that they cannot receive any additional material from the restricted screen.

If your permit does not include some sort of hourly production restrictions, the manufacturer’s rated capacity of the primary crusher should be the limit for the plant. It is also important to remember that the normal setting used at the primary crusher should be the opening that is used to determine the capacity. This is included in the definition of capacity as the physical and operational limitation of the facility. The plant is designed in its current configuration to produce specification material for the construction industry. If the crushers were allowed to open to the widest setting the material produced would not be a sellable product.

**ALLOWABLE THROUGHPUTS**

	PROCESS ID#
	Actual Processed (t/yr)
	Rated Capacity (t/hr)
	Allowable (t/yr)

If your permit states an annual production limit for the plant or for phases of the plant this amount should be used as the maximum rate the facility is allowed to produce. This amount should then be distributed throughout the plant in a normal flow pattern to determine the annual allowable amount for each item. The allowable throughput is used only as a convenience to remind the operator of the permit limit, it is not used to calculate particulate emissions.

If you do not have annual production limits in your permit or if you are a grandfathered source (only registered) you must hand calculate the limit based on operating at capacity for 8,760 hours a year. For example: 500 tons/hour x 8760 hours/year = 4,380,000 tons/year. This amount should also be distributed through the plant in a normal flow pattern.

## NSPS ITEMS

	NSPS?
	Dry
	Wet
	Bag

The last information needed before the spreadsheet can be used is a determination of which process items in the plant fall under the requirements of New Source Performance Standards (NSPS). These items are defined as all crushers, screens, conveyors, bagging operations, storage bins, enclosed truck and railcar loadouts manufactured after August 31, 1983. If your operation contains NSPS items they should be noted on your flow diagram. Open truck loadouts, by front-end loader, belt conveyor, or storage bin are not affected facilities subject to NSPS Subpart OOO.

### Description

At each process item that corresponds to an item in the plant, fill in an appropriate Process ID# for that unit under the "Description" heading. This number should relate to the company number, serial number, plant number or flow diagram number. Alphanumeric entries are acceptable. Also under the Description heading the Actual Processed tonnage (tpy), Rated Capacity (tph) and Allowable tonnage (tpy) should be entered for each unit.

### Flags

If the item is an NSPS affected unit, the number one ("1") should be placed in the NSPS block under the "Flags" heading. This flag identifies the NSPS Subpart OOO affected facilities.

The next item under the "Flags" heading is the control method used at the item. If the unit is not permitted (only has a registration number) or has no active control system at the unit or that could contribute to controlling the unit, the dry emission factors must be chosen. This is done by entering the number one "1" in front of the "Dry" designation. All of the emission totals for this particular plant item will be calculated using the dry emission factors. If the process uses only total enclosure as the air pollution control system (example: fine screening of aglime), the expression (100% - 90% for enclosure) in decimal form will calculate the controlled hourly and expected annual emissions. However, the potential 8760 hr/yr emissions will be incorrectly calculated.

If the item was permitted with wet suppression at the item or with carry-over from wet suppression applied upstream in the process, the "Wet" designation should be used by entering a "1" adjacent to the word Wet. All emissions from this item will be calculated using the controlled emissions factors shown on the spreadsheet.

If the emissions from the item are controlled by a baghouse, the "Bag" designation should be chosen. The emission factors have already been adjusted based upon an accepted control efficiency listed in the Boilerplate Air Permit. The dry emission factors are already adjusted by applying a 99% control efficiency. The program will calculate emissions from this item using the baghouse factors.

If the item is included in the wash plant, no emissions are possible from the unit. In order to show this item in the spreadsheet and calculate zero emissions the letters “WP” or “WET” should be placed in front of the "Wet" designation. No other entries should be present. The spreadsheet treats all alpha characters as zero. This will flag the item as a wash plant unit and will tell the spreadsheet to calculate zero emissions from the item.

Likewise, it is suggested that you list all conveyors on the spreadsheet. Remember, only those conveyors that have a transfer point (belt to belt) will have emissions. For example, discharge out of a crusher onto a belt which then discharges directly to a screen has no transfer point. The transfer emissions are included in the crusher and screen emission factors. For these belts, enter “NTP” or “NTE” in the Flags. NTP or NTE (or any alphabetical identifier) specifies that “no transfer points or no transfer emission” are present and, therefore, no emissions are calculated.

### **Emission Totals**

#### **Actual Emissions**

The spreadsheet will calculate all of the actual emissions based on the actual processed tonnage amounts entered under the "Description" heading. These tonnage figures will be multiplied by the factors chosen under the "Flags" section. All of the items in the plant will contribute to this total regardless of their NSPS designation. This actual emission total is shown in tons per year for PM, PM10 and PM2.5... This will also be the column used to update your annual emissions inventory submitted to DEQ.

#### **Potential Emissions (Controlled)**

This column of emission totals is given in pounds per hour for PM, PM10, and PM2.5. These numbers are used in the permitting process and are used to verify that the facility remains below any current hourly emission limits set in the permit.

#### **Uncontrolled**

Uncontrolled PM, PM10, and PM2.5 emissions in tons per year are generated to determine if any of the processes are below the permitting limits set in the Virginia Air Regulations. The program automatically uses the dry factors for these calculations. For permit applicability, see the minor NSR Permit Manual.

#### **Title V Potential**

These emissions are based on the allowable PM10 and PM2.5 emissions. The appropriate controlled factors are used for this calculation. The total allowable PM-10 emissions will be the amount used to determine how this facility will be classified under Title V. If the plant Title V Potential (permitted emissions or potential to emit) is greater than 100 tons the site may have to complete a Title V application with the state unless additional operating limits are taken. Contact DEQ on available permitting options.

### **Emissions Summary**

All of the individual process category emissions are automatically totaled here. A facility total is also given under each emission category.



**OTHER INFORMATION**

Permits are also required from the Department of Mines, Minerals, and Energy; Division of Mineral Mining, Charlottesville (pit area, equipment installation safety, road accessibility, certified blasters, and foremen). The DEQ-Air Division permit does not cover these matters. The Division of Mineral Resources, Charlottesville, can assist with geologic data information.