

**APPLICATION PACKET**

**FOR A**

**CRUSHING/SCREENING PLANT**

**GENERAL PERMIT**



**Arizona Department of Environmental Quality**

**Air Quality Division**

April 6, 2011

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## I. INTRODUCTION

This packet has been developed specifically for applicants applying for coverage under the Crushing/Screening General Permit in lieu of an individual permit. To expedite the processing of an air quality control permit application, the Arizona Department of Environmental Quality (ADEQ) has created a general permit for Crushing and Screening Plants. Facilities which meet the criteria in this general permit application will be permitted under the Crushing and Screening Plant general permit and will pay lower annual air quality fees than Crushing and Screening Plants covered under an individual air quality permit. The Crushing and Screening General Permit allows for co-location with a Concrete Batch Plant, but does not cover stand alone Concrete Batch Plants. If an owner has both a Crushing and Screening General Permit and a Concrete Batch Plant General Permit, then the Crushing and Screening General Permit applies only when the Concrete Batch Plant is co-located with the Crushing and Screening Plant. Otherwise the Concrete Batch Plant General Permit will cover the Concrete Batch Plant. However, this packet is not intended as a substitute for the Arizona Air Quality Regulations.

This application packet assists the applicant in the submittal of information that is required to process their application for an air quality control permit. Applicants wishing to obtain a Crushing and Screening Plant general permit shall apply to ADEQ, except for facilities permanently located on an Indian Reservation or in Pima, Pinal, or Maricopa Counties. If the facility is located on the reservation or in one of these counties, the local air quality agency will process the air quality permit application. If the applicant has any questions regarding jurisdictional issues, please contact the appropriate agency at the phone number below:

**ADEQ:** 1-800-234-5677 ext 7712337

**Maricopa County:** (602) 506-6010

**Pima County:** (520) 273-7400

**Pinal County:** (520) 866-6929

### A. APPLICABILITY

1. The Crushing/Screening General Permit, hereafter referred to as General Permit covers crushing/screening plants (non-metallic mineral processing plants belonging to major group 14 as described in the Standard Industrial Classification Manual, 1987) that are subject to Federal New Source Performance Standards (NSPS), State regulations, and/or County Regulations. The General Permit covers crushing/screening plants which have a Potential To Emit (PTE) of  $PM_{10}$  no greater than 13.64 tons per year (TPY) from all process emission such as crushers, screens, conveyor belt transfer points, and silos, considering pollution controls and operating only sixteen hours per day.
2. This General Permit also covers crushing/screening plants which have internal combustion engines whose total nitrogen oxide ( $NO_x$ ) and carbon monoxide (CO) emissions do not exceed 90 TPY of each pollutant considering only sixteen hours per day of operation.

3. The General Permit also covers Concrete Batch Plants that are co-located at the facility and are subject to state and/or county regulations. The General Permit does not cover stand alone Concrete Batch Plants.
4. This General Permit applies to sources operating in all counties of Arizona including Maricopa County. Sources planning to operate in Maricopa County need to calculate the hourly limitations that will be imposed on the facility due to the non-attainment status of the area. Sources will be limited to NO<sub>x</sub>, VOC, SO<sub>2</sub>, and PM emissions of 135 pounds per day and 22.5 tons per year, CO emissions of 495 pounds per day and 90 tons per year, and PM<sub>10</sub> emissions of 76.5 pounds per day and 13.5 ton per year.
5. Sources planning to operate solely in Maricopa, Pima or Pinal Counties during the entire permit term need to obtain an individual or a general permit from the Maricopa County Air Quality Department (AQD), Pima County Air Quality Control District (AQCD), or Pinal County AQCD.

## **B. AUTHORIZATIONS TO OPERATE**

1. If the applicant meets the criteria for coverage under this General Permit, an Authorization To Operate (ATO) will be issued for each crusher, screen, internal combustion engine, and lime silo. If the facility will be co-located with a Concrete Batch Plant then ATOs will also be issued for the concrete batch plant equipment (which includes connected conveyor systems and feed hoppers, enclosed augers and silos, weigh hoppers, and mixers), and stand alone silos (which include attached baghouse and pneumatic or bucket loading system, elevated storage bins, storage piles, and wash plant).
2. If the Applicant is a rental company, the Applicant will apply for coverage under this General Permit by grouping together representative crushers, screens, internal combustion engines, concrete batch plant equipment and associated equipment that are typical of the plants that are rented out to the crushing/screening industry. This grouping will be limited to the conditions specified in A.1, A.2, and A.4. The Applicant will continue grouping equipment as previously mentioned until all crushers, screens, internal combustion engines, and associated equipment are covered under this General Permit. Depending upon the amount of rental equipment that is owned by the applicant, it is possible that the Applicant may end up with multiple coverages under this General Permit.

## **C. JURISDICTION**

Pursuant to A.R.S. §49-480 the AQD of Maricopa, AQCD's of Pima and Pinal Counties may administer, inspect, and enforce the General Permit and issue ATOs for sources under their jurisdiction.

1. Stationary Sources

Stationary sources wishing to obtain coverage under the General Permit shall apply to the Arizona Department of Environmental Quality (ADEQ), except for stationary sources which are located exclusively in Maricopa, Pima, or Pinal Counties. If the stationary source is located in one of these three counties, the county agency will process the application for a permit.

2. Portable Sources

Portable sources wishing to obtain coverage under the General Permit shall apply to the Arizona Department of Environmental Quality (ADEQ), except for portable sources which will operate for the duration of the General Permit solely in Maricopa, Pima, or Pinal County. If the portable source will operate for the duration of the General Permit in one of these three counties, the county agency will process the application for a permit.

3. If the applicant has any questions regarding jurisdictional issues, please contact ADEQ.

**D. PERMIT ISSUANCE TIME FRAME**

According to A.A.C. R18-1-525, ADEQ has 21 business days to determine if the submitted general permit application is complete. Once the application is determined to be complete, the department has 103 business days to make a licensing decision on the application. The counting of the days can be suspended by the Department upon the determination that additional information is needed. In such a case, a letter will be sent to the applicant informing them that the counting of days has been suspended, and will also specify what additional information is necessary to continue processing the application.

**II. APPLICATION INSTRUCTIONS**

This section of the packet helps the applicant assemble a complete application, make the appropriate calculations, complete a compliance plan/certification, and submit all information in a manner which will expedite applications review.

ADEQ recognizes that crushing and screening plants, in general, move and change equipment configuration frequently. The information provided in the application should reflect the current situation.

Please read all sections of this packet very carefully. Provide all information requested. The final application submitted should include all the forms in the application packet and any attachments necessary to submit all information (i.e. map, plot plan, etc.). Make additional copies of the forms as necessary to be sure all information is included.

## **A. STEP 1: Standard Permit Application Form**

A.A.C. R18-2-304 requires applicants to submit the Standard Application Form and Filing Instructions. The first step to fulfilling the submittal requirements for coverage under the General Permit is properly completing FORM 1 "STANDARD APPLICATION FORM". Instructions are as follows:

1. Items #1 through #4: Complete Permit to be issued to, Mailing Address, Previous Company Name (if applicable), Name of Owner/Principals and Phone, Fax and Email of Owner/Principals.
2. Item #5: Enter name of Owner's Agent if another individual/company will be submitting the general permit application on the owner's behalf.
3. Item #6: The Plant/Site Manager or Contact Person shall be the person the ADEQ may contact for any additional information.
4. Item #7: Specify the name and location of the plant. The township/range/section may be substituted for latitude/longitude coordinates which are specified in degrees, minutes and seconds.
5. Item #8, the "Equipment Name/Purpose and Equipment List/Description" should describe what is produced at the plant. The Equipment List/Description can be referenced to Form 3.
6. Item #9: If the "other" box is checked, please be specific as to what the organization is.
7. Item #10: asks for the Permit Application Basis which indicates what type of permit is necessary.
  - a. If the equipment has never been permitted, then the boxes titled "New Source" and "General Permit" should be checked.
  - b. If the equipment is already permitted under an individual permit and you are applying for coverage under the General Permit, then the boxes titled "Renewal of Existing Permit" and "General Permit" should be checked and the current permit number must be included on the line titled "For renewal or modification, include existing permit number".
  - c. If you have a group of equipment covered by the General Permit and you are adding additional equipment, then the boxes titled "Revision" and "General Permit" should be checked and the current General Permit Number(s) must be included on the line titled "For renewal or modification, include existing permit number".

- d. If the equipment is portable, then the box titled "Portable Source" should be checked.
  - e. For new sources the "Date of Commencement of Construction or Modification" is the expected date that construction will begin. For existing sources this date need not be defined.
  - f. If there is any chance that the equipment will be leased out, answer "yes" in the appropriate box.
  - g. The "Standard Industrial Classification Code" for crushing and screening plants is **1499**.
  - h. The "State Permit Class" for crushing and screening plants utilizing this application packet is "**II**".
8. Items #11 and #12: The "Responsible Official" is the owner or a partner of the company in most cases. It may also be the president or vice-president of larger companies. This official will ensure that the information submitted in the application is correct and that the requirements of the permit are followed. If there is a question as to who the responsible official is, contact ADEQ for more information.

## **B. STEP 2: Emission Calculations**

The amount of pollution emitted from the crushing/screening operations, internal combustion engines, and if applicable the concrete batch plant operations must be submitted. FORMS 2 and 3 should be used to calculate these emissions. The emission factors in this application are based on EPA's Air Pollution Engineering Manual, AP-42 (Sections 3.3, 3.4, and 11.12) and include the usage of wet suppression.

## **C. STEP 3: Equipment List**

1. ADEQ needs to be able to identify all pieces of equipment covered under the General Permit. Use FORM 5 to provide a list of all pieces of equipment to be permitted including control equipment and internal combustion engines (this does not include internal combustion engines associated with motor driven vehicles). **The list should include not only the type of equipment, but also the make, model, maximum rated capacity, serial number, manufacture date, and equipment identification number (if available) of each piece of equipment.** Please make additional copies if necessary.
2. In many cases, the equipment will not yet have been purchased at the time of application. If this is the case, the serial number will not need to be listed, but an equipment identification number will need to be provided. The equipment identification number must be clearly stenciled on each piece of equipment to be

permitted before such equipment is installed.

**D. STEP 4: Air Pollution Controls**

All pollution control equipment and pollution control procedures must be described in order to satisfy this submittal requirement. FORM 6 can be used to submit the necessary pollution control information.

**E. STEP 5: Operation and Maintenance Plan**

An operation and maintenance plan must be submitted by all applicants. FORM 7 can be used to submit a complete operation and maintenance plan.

**F. STEP 6: Compliance Certification**

A compliance certification must be submitted by all applicants. FORM 8 can be used to submit a complete compliance plan/certification.

**G. STEP 7: Map of Plant Location**

Please provide a map of the current plant location, depicting the plant perimeter and point of entry. This may be a city map, topographical map or any map which clearly shows the location. Mark the location of the plant on the map and submit it as part of the application. The map should include driving directions to the plant site from the nearest highway.

**H. STEP 8: Plot Plan**

Please provide a plot plan of the current equipment configuration. A plot plan is an aerial drawing of the plant property drawn to scale or dimensions shown. It should include:

1. A schematic of the typical equipment layout;
2. location of stacks and all tanks, silos, bins, conveyors, storage piles, control equipment, and other equipment;
3. a scale, if the drawing is to scale; and
4. photographs of the equipment if available.

## **I. STEP 9: Dust Control Plan**

If the initial location of the facility is in Maricopa County, the facility must submit a Dust Control Plan as described under Maricopa County Rule 316. The applicant may use the form available at Maricopa County Air Quality Department's website by clicking the following link. This form must be filled in and submitted to ADEQ along with the application.

URL: <http://www.maricopa.gov/airquality/divisions/compliance/dust/docs/pdf/Empermit.pdf>.

## **J. STEP 10: Process Description**

Please provide a process description or process flow diagram. A process description is a brief description of the product manufacturing process. This includes a description of how the process material is received, processed, stored, and mixed, as well as how the final products are handled.

## **K. STEP 11: Filing Instructions**

1. An Application Fee of \$500 must be submitted by all applicants. Please make your check or money order payable to ADEQ. The Application Fee must accompany each application submittal.
2. Please mail FORMS 1 through 9 of the application packet, Map of Plant Location, Plot Plan, Process Description and the \$500 Application Fee to the following address:

Arizona Department of Environmental Quality  
Air Quality Division  
1110 West Washington  
Phoenix, Arizona 85007

3. Please remember to make photo copies of FORMS 1 through 9 of the application packet, the Map of Plant Location, the Plot Plan, and the Process Description before mailing.
4. Pages 1 through 11 of the application packet should be kept by the applicant for reference purposes.

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**FORM 1: STANDARD PERMIT APPLICATION FORM**  
**ARIZONA DEPARTMENT OF ENVIRONMENTAL QUALITY**  
**Air Quality Division**  
**1110 West Washington St ♦ Phoenix, AZ 85007 ♦ Phone: (602) 771-2338**

# STANDARD PERMIT APPLICATION FORM

*(As required by A.R.S. ' 49-426, and Chapter 2, Article 3, Arizona Administrative Code)*

1. Permit to be issued to: (Business license name of organization that is to receive permit) \_\_\_\_\_  
\_\_\_\_\_
2. Mailing Address: \_\_\_\_\_  
City: \_\_\_\_\_ State: \_\_\_\_\_ ZIP: \_\_\_\_\_
3. Previous Company Name: (if applicable) \_\_\_\_\_
4. Name (or names) of Owners/Principals: \_\_\_\_\_  
Phone: \_\_\_\_\_ Fax: \_\_\_\_\_ Email: \_\_\_\_\_
5. Name of Owner's Agent: \_\_\_\_\_  
Phone: \_\_\_\_\_ Fax: \_\_\_\_\_ Email: \_\_\_\_\_
6. Plant/Site Manager or Contact Person/Title: \_\_\_\_\_  
Phone: \_\_\_\_\_ Fax: \_\_\_\_\_ Email: \_\_\_\_\_
7. Proposed Plant Name: \_\_\_\_\_  
Proposed Plant Location/Address: \_\_\_\_\_  
City: \_\_\_\_\_ County: \_\_\_\_\_ ZIP: \_\_\_\_\_  
Indian Reservation (if applicable): \_\_\_\_\_  
Latitude/Longitude, Elevation: \_\_\_\_\_
8. Equipment Name/Purpose: \_\_\_\_\_  
Equipment List/Description: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_
9. Type of Organization:  
 Corporation       Individual Owner  
 Partnership       Government Entity (Government Facility Code: \_\_\_\_\_)  
 Other \_\_\_\_\_
10. Permit Application Basis:       New Source       Revision       Renewal of Existing Permit  
(Check all that apply.)       Portable Source       General Permit  
For renewal or modification, include existing permit number (and exp. date): \_\_\_\_\_  
Date of Commencement of Construction or Modification: \_\_\_\_\_  
Is **any** of the equipment to be leased to another individual or entity?       Yes       No  
Standard Industrial Classification Code: \_\_\_\_\_ **1499** \_\_\_\_\_ State Permit Class: \_\_\_\_\_ **II**
11. Signature of Responsible Official of Organization: \_\_\_\_\_  
Official Title of Signer: \_\_\_\_\_
12. Typed or Printed Name of Signer: \_\_\_\_\_  
Date: \_\_\_\_\_ Telephone Number: \_\_\_\_\_

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## FORM 2: EMISSION CALCULATIONS OUTSIDE OF MARICOPA COUNTY

### 1. CRUSHING/SCREENING

In order for ADEQ to fully evaluate a General Permit application, the amount of pollution emitted from the crushing/screening operations must be submitted. This section of the manual is intended to guide the applicant through the emission calculations if the applicant intends to operate **outside of Maricopa County**. The applicant should make additional copies of any pages necessary to submit the total emissions from all crushing/screening operations.

#### a. Calculating Emissions From Batch Drop Operations

- i. Examples of batch drop operations include truck dumping onto a storage pile, loading out from a storage pile to a truck with a front-end loader, or front-end loader dumping onto a storage pile. Batch drop operations do not include the loading of feed hoppers. TABLE 2 has been designed to calculate the emissions from the loading of feed hoppers.
- ii. TABLE 1 must be completed, in order to calculate the PM<sub>10</sub> emissions from batch drop operation(s). To calculate emissions from batch drop operations, the maximum throughput rate of the plant listed in column (a) is multiplied by the emission and conversion factor listed in columns (b) and (c).
- iii. Once the emissions have been calculated for all batch drop operations, the emissions must be summed up and placed in the box labeled "Total PM<sub>10</sub> Emissions".

**TABLE 1: PM<sub>10</sub> EMISSIONS FROM BATCH DROP OPERATIONS**

Maximum Throughput Rate (ton/hr) <i>(a)</i>	Emission Factor (lb/ton) <i>(b)</i>	Conversion Factor (ton-hr/Lb-yr) <i>(c)</i>	Emissions (ton/yr) <i>(a x b x c)</i>
	0.00048	2.92	
<b>TOTAL PM<sub>10</sub> EMISSIONS (ton/yr):</b>			

**FORM 2: EMISSION CALCULATIONS OUTSIDE OF MARICOPA COUNTY, CONTINUED**

**b. Calculating Emissions From The Loading Of Feed Hoppers**

- i. TABLE 2 must be completed, in order to calculate the PM<sub>10</sub> emissions from the loading of feed hopper(s). To calculate emissions from the loading of feed hoppers, the maximum throughput rate of each feed hopper listed in column (a) is multiplied by the emission and conversion factor listed in columns (b) and (c).
- ii. Once the emissions have been calculated for the loading of all feed hoppers, the emissions must be summed up and placed in the box labeled "Total PM<sub>10</sub> Emissions".

**TABLE 2: PM<sub>10</sub> EMISSIONS FROM THE LOADING OF FEED HOPPERS**

Serial # or Equipment ID #	Maximum Throughput Rate  (ton/hr)  (a)	Emission Factor  (lb/ton)  (b)	Conversion Factor  (ton-hr/Lb-yr)  (c)	Emissions  (ton/yr)  (a x b x c)
		0.00048	2.92	
		0.00048	2.92	
		0.00048	2.92	
		0.00048	2.92	
		0.00048	2.92	
<b>TOTAL PM<sub>10</sub> EMISSIONS (ton/yr):</b>				

**FORM 2: EMISSION CALCULATIONS OUTSIDE OF MARICOPA COUNTY, CONTINUED**

**c. Calculating Emissions From Crushers**

- i. TABLE 3 must be completed, in order to calculate the PM<sub>10</sub> emissions from the crusher(s). To calculate emissions from the crusher(s), the maximum throughput rate of each crusher listed in column (a) is multiplied by the emission and conversion factors listed in columns (b) and (c). Once the emissions have been calculated for each crusher, the emissions from all the crushers must be summed up and placed in the box labeled "Total PM<sub>10</sub> Emissions".
- ii. Primary crushers are defined as any crusher that reduces material to approximately 3 to 12 inches in diameter. Secondary crushers are defined as any crusher that reduces material to approximately 1 to 4 inches in diameter. Tertiary crushers are defined as any crusher that reduces material to approximately 3/16th to 1 inch in diameter.

**TABLE 3: PM<sub>10</sub> EMISSIONS FROM CRUSHERS**

Serial # or Equipment ID #	Maximum Throughput Rate  (ton/hr)  (a)	Emission Factor  (lb/ton)  (b)	Conversion Factor  (ton-hr/Lb-yr)  (c)	Emissions  (ton/yr)  (a x b x c)
<b>PRIMARY CRUSHERS</b>				
		0.00054	2.92	
		0.00054	2.92	
		0.00054	2.92	
		0.00054	2.92	
		0.00054	2.92	
<b>SECONDARY CRUSHERS</b>				
		0.00054	2.92	
		0.00054	2.92	
		0.00054	2.92	
		0.00054	2.92	
		0.00054	2.92	
<b>TERTIARY CRUSHERS</b>				
		0.00054	2.92	
		0.00054	2.92	
		0.00054	2.92	
		0.00054	2.92	
		0.00054	2.92	
<b>TOTAL PM<sub>10</sub> EMISSIONS (ton/yr):</b>				

**FORM 2: EMISSION CALCULATIONS OUTSIDE OF MARICOPA COUNTY, CONTINUED**

**d. Calculating Emissions From Screens**

- i. TABLE 4 must be completed in order to calculate the PM<sub>10</sub> emissions from the screen(s). To calculate emissions from the screen(s), the maximum throughput rate of each screen listed in column (a) is multiplied by the emission and conversion factors listed in columns (b) and (c). Once the emissions have been calculated for each screen, the emissions from all the screens must be summed up and placed in the box labeled "Total PM<sub>10</sub> Emissions".
- ii. Fines screens are defined as any screen that sizes material up to 3/16th inches in diameter.

**TABLE 4: PM<sub>10</sub> EMISSIONS FROM SCREENS**

Serial # or Equipment ID #	Maximum Throughput Rate  (ton/hr)  (a)	Emission Factor  (lb/ton)  (b)	Conversion Factor  (ton-hr/Lb-yr)  (c)	Emissions  (ton/yr)  (a x b x c)
<b>SCREENING</b>				
		0.00074	2.92	
		0.00074	2.92	
		0.00074	2.92	
		0.00074	2.92	
		0.00074	2.92	
<b>FINES SCREENING</b>				
		0.0022	2.92	
		0.0022	2.92	
		0.0022	2.92	
		0.0022	2.92	
		0.0022	2.92	
<b>TOTAL PM<sub>10</sub> EMISSIONS (ton/yr):</b>				

**FORM 2: EMISSION CALCULATIONS OUTSIDE OF MARICOPA COUNTY, CONTINUED**

**e. Calculating Emissions From Stackers And Transfer Points**

- i. TABLE 5 must be completed, in order to calculate the PM<sub>10</sub> emissions from the stacker(s) and transfer point(s). To calculate emissions from the stacker(s), the maximum throughput rate of each stacker listed in column (a) is multiplied by the emission and conversion factors listed in columns (b) and (c). To calculate emissions from the transfer point(s), the number of transfer point(s) listed in column (a) is multiplied by the maximum throughput rate, the emission factor, and the conversion factor listed in columns (b), (c), and (d). A transfer point is a point of emission where the process material is airborne (e.g. between two conveyors).
- ii. Once the emissions have been calculated for each stacker and transfer point, the emissions from all the stackers and transfer points must be summed up and placed in the box labeled "Total PM<sub>10</sub> Emissions".

**TABLE 5: PM<sub>10</sub> EMISSIONS FROM STACKERS AND TRANSFER POINTS**

Serial # or Equipment ID #	Maximum Throughput Rate  (ton/hr)  (a)	Emission Factor  (lb/ton)  (b)	Conversion Factor  (ton-hr/Lb-yr)  (c)	Emissions  (ton/yr)  (a x b x c)
<b>STACKERS</b>				
		0.00048	2.92	
		0.00048	2.92	
		0.00048	2.92	
		0.00048	2.92	
		0.00048	2.92	
Number of Transfer Points  (a)	Maximum Throughput Rate  (ton/hr)  (b)	Emission Factor  (lb/ton)  (c)	Conversion Factor  (ton-hr/Lb-yr)  (d)	Emissions  (ton/yr)  (a x b x c x d)
<b>TRANSFER POINTS</b>				
		0.000046	2.92	
		0.000046	2.92	
		0.000046	2.92	
		0.000046	2.92	
		0.000046	2.92	
<b>TOTAL PM<sub>10</sub> EMISSIONS (ton/yr):</b>				

**FORM 2: EMISSION CALCULATIONS OUTSIDE OF MARICOPA COUNTY, CONTINUED**

**f. Calculating Emissions From Lime Silos**

TABLE 6 must be completed, in order to calculate the PM<sub>10</sub> emissions from the lime silo operation(s). To calculate emissions from the loading of the lime silo(s), the maximum throughput rate of the plant listed in column (a) is multiplied by the maximum fraction of lime added by weight to the material, the control factor, the emissions factor, and the conversion factor listed in columns (b), (c), (d), and (e). To calculate emissions from the lime discharging onto conveyor belts, the number of discharge point(s) listed in column (a) is multiplied by the maximum throughput rate of the plant, the maximum fraction of lime added by weight to the material, the emission factor, and conversion factor listed in columns (b), (c), (d), and (e). Once the emissions have been calculated for each lime silo and the discharging of lime onto conveyor belts, the emissions from all the lime silo activities must be summed up and placed in the box labeled "Total PM<sub>10</sub> Emissions".

**TABLE 6: PM<sub>10</sub> EMISSIONS FROM LIME SILOS**

Serial # or Equipment ID #	Maximum Throughput Rate (ton/hr) (a)	Maximum Amount Of Lime Added By Weight ( percentage / 100 ) (b)	Control Efficiency of Baghouse Or Wet Scrubber ( 1 - [control efficiency / 100] ) (c)	Emission Factor (lb/ton) (d)	Conversion Factor (ton-hr/Lb-yr) (e)	Emissions (ton/yr) (a x b x c x d x e)
<b>PNEUMATIC LOADING OF LIME SILO</b>						
				1.1	2.92	
				1.1	2.92	
				1.1	2.92	
				1.1	2.92	
Number of Discharge Points (a)	Maximum Throughput Rate (ton/hr) (b)	Maximum Amount Of Lime Added By Weight ( percentage / 100 ) (c)		Emission Factor (lb/ton) (d)	Conversion Factor (ton-hr/Lb-yr) (e)	Emissions (ton/yr) (a x b x c x d x e)
<b>DISCHARGING OF LIME ONTO CONVEYOR BELTS</b>						
				0.000046	2.92	
				0.000046	2.92	
				0.000046	2.92	
				0.000046	2.92	
<b>TOTAL PM<sub>10</sub> EMISSIONS:</b> (ton/yr)						

**FORM 2: EMISSION CALCULATIONS OUTSIDE OF MARICOPA COUNTY, CONTINUED**

**2. Concrete Batch Plant Emissions**

TABLE 7 and/or TABLE 8 must be completed, in order to calculate the PM<sub>10</sub> emissions from concrete batch plants, per cubic yard (yd<sup>3</sup>) of truck mix or central mix concrete. To calculate emissions for the overall concrete batch plant, the maximum throughput rate of the plant listed in column (a) is multiplied by the emission and conversion factors listed in columns (b) and (c). To calculate emissions from the concrete batch plant listed in column (a) is multiplied by the maximum throughput rate, the emission factor, and the conversion factor listed in columns (b), (c), and (d).

**TABLE 7: PM<sub>10</sub> Emissions from Concrete Batch Plant Operations (Truck Mix Concrete)**

Serial # or Equipment ID #	Maximum Throughput Rate  (tons/hr)  (a)	Emission Factor  (lb/ tons)  (b)	Conversion Factor  (ton-hr/Lb-yr)  (c)	Emissions  (ton/yr)  (a x b x c)
		0.015	2.92	
		0.015	2.92	
		0.015	2.92	
		0.015	2.92	
		0.015	2.92	
<b>TOTAL PM<sub>10</sub> EMISSIONS (ton/yr):</b>				

**TABLE 8: PM<sub>10</sub> Emissions from Concrete Batch Plant Operations (Central Mix Concrete)**

Serial # or Equipment ID #	Maximum Throughput Rate  (tons/hr)  (a)	Emission Factor  (lb/ ton)  (b)	Conversion Factor  (ton-hr/Lb-yr)  (c)	Emissions  (ton/yr)  (a x b x c)
		0.013	2.92	
		0.013	2.92	
		0.013	2.92	
		0.013	2.92	
		0.013	2.92	
<b>TOTAL PM<sub>10</sub> EMISSIONS (ton/yr):</b>				

**FORM 2: EMISSION CALCULATIONS OUTSIDE OF MARICOPA COUNTY, CONTINUED**

**3. Internal Combustion Engine Emissions**

In order for ADEQ to fully evaluate a General Permit application, the amount of pollution emitted from the internal combustion engine(s) must be submitted (this does not include mobile equipment such as trucks and front end loaders). This section of the manual is intended to guide the applicant through the emission calculations. The emission factors are based on EPA's Air Pollution Engineering Manual, AP-42. The applicant should make additional copies of any pages necessary to submit the total emissions from all internal combustion engines.

**a. Calculating Emissions From Internal Combustion Engines Burning Gasoline**

TABLE 9 and 10 must be completed, in order to calculate the emissions from internal combustion engines which have a power output less than or equal to 447 kW (600 hp) and use gasoline for fuel. Emissions from the internal combustion engines are calculated by taking the power output of the internal combustion engine in horsepower listed in column (a) and multiplying it by the emission and conversion factors listed in columns (b) and (c).

**TABLE 9: EMISSIONS FOR INTERNAL COMBUSTION ENGINES BURNING GASOLINE**

Serial # or Equipment ID #	Horsepower  (HP)  (a)	Pollutant	Emission Factor  (lb/HP-hr)  (b)	Conversion Factor  (ton-hr/Lb-yr)  (c)	Emissions  (ton/yr)  (a x b x c)
		Nitrogen Oxides	0.011	2.92	
		Nitrogen Oxides	0.011	2.92	
		Nitrogen Oxides	0.011	2.92	
		Nitrogen Oxides	0.011	2.92	
		Nitrogen Oxides	0.011	2.92	
<b>TOTAL NO<sub>x</sub> EMISSIONS (ton/yr)</b>					

**TABLE 10: EMISSIONS FOR INTERNAL COMBUSTION ENGINES BURNING GASOLINE**

Serial # or Equipment ID #	Horsepower  (HP)  (a)	Pollutant	Emission Factor  (lb/HP-hr)  (b)	Conversion Factor  (ton-hr/Lb-yr)  (c)	Emissions  (ton/yr)  (a x b x c)
		Carbon Monoxide	0.00696	2.92	
		Carbon Monoxide	0.00696	2.92	
		Carbon Monoxide	0.00696	2.92	
		Carbon Monoxide	0.00696	2.92	
<b>TOTAL CO EMISSIONS (ton/yr)</b>					

**FORM 2: EMISSION CALCULATIONS OUTSIDE OF MARICOPA COUNTY, CONTINUED**

**b. Calculating Emissions From Internal Combustion Engines Below 447 kW (600 hp) Burning Diesel**

TABLE 11 and 12 must be completed, in order to calculate the emissions from internal combustion engines which have a power output less than or equal to 447 kW (600 hp) and use diesel for fuel. Emissions from the internal combustion engines are calculated by taking the power output of the internal combustion engine in horsepower listed in column (a) and multiplying it by the emission and conversion factors listed in columns (b) and (c).

**TABLE 11: EMISSIONS FOR INTERNAL COMBUSTION ENGINES LESS THAN OR EQUAL TO 447 KW (600 HP) BURNING DIESEL**

Serial # or Equipment ID #	Horsepower  (HP)  (a)	Pollutant	Emission Factor  (lb/HP-hr)  (b)	Conversion Factor  (ton-hr/Lb-yr)  (c)	Emissions  (ton/yr)  (a x b x c)
		Nitrogen Oxides	0.031	2.92	
		Nitrogen Oxides	0.031	2.92	
		Nitrogen Oxides	0.031	2.92	
		Nitrogen Oxides	0.031	2.92	
		Nitrogen Oxides	0.031	2.92	
<b>TOTAL NO<sub>x</sub> EMISSIONS (ton/yr)</b>					

**TABLE 12: EMISSIONS FOR INTERNAL COMBUSTION ENGINES LESS THAN OR EQUAL TO 447 KW (600 HP) BURNING DIESEL**

Serial # or Equipment ID #	Horsepower  (HP)  (a)	Pollutant	Emission Factor  (lb/HP-hr)  (b)	Conversion Factor  (ton-hr/Lb-yr)  (c)	Emissions  (ton/yr)  (a x b x c)
		Carbon Monoxide	0.0067	2.92	
		Carbon Monoxide	0.0067	2.92	
		Carbon Monoxide	0.0067	2.92	
		Carbon Monoxide	0.0067	2.92	
<b>TOTAL CO EMISSIONS (ton/yr)</b>					

**FORM 2: EMISSION CALCULATIONS OUTSIDE OF MARICOPA COUNTY, CONTINUED**

**c. Calculating Emissions From Internal Combustion Engines Greater Than 447 kW (600 hp) Burning Diesel**

TABLE 13 and 14 must be completed, in order to calculate the emissions from internal combustion engines which have a power output greater than 447 kW (600 hp) and use diesel for fuel. Emissions from the internal combustion engines are calculated by taking the power output of the internal combustion engine in horsepower listed in column (a) and multiplying it by the emission and conversion factors listed in columns (b) and (c).

**TABLE 13: EMISSIONS FOR INTERNAL COMBUSTION ENGINES GREATER THAN 447 KW (600 HP) BURNING DIESEL**

Serial # or Equipment ID #	Horsepower  (HP)  (a)	Pollutant	Emission Factor  (lb/HP-hr)  (b)	Conversion Factor  (ton-hr/Lb-yr)  (c)	Emissions  (ton/yr)  (a x b x c)
		Nitrogen Oxides	0.024	2.92	
		Nitrogen Oxides	0.024	2.92	
		Nitrogen Oxides	0.024	2.92	
		Nitrogen Oxides	0.024	2.92	
		Nitrogen Oxides	0.024	2.92	
<b>TOTAL NO<sub>x</sub> EMISSIONS (ton/yr)</b>					

**TABLE 14: EMISSIONS FOR INTERNAL COMBUSTION ENGINES GREATER THAN 447 KW (600 HP) BURNING DIESEL**

Serial # or Equipment ID #	Horsepower  (HP)  (a)	Pollutant	Emission Factor  (lb/HP-hr)  (b)	Conversion Factor  (ton-hr/Lb-yr)  (c)	Emissions  (ton/yr)  (a x b x c)
		Carbon Monoxide	0.0055	2.92	
		Carbon Monoxide	0.0055	2.92	
		Carbon Monoxide	0.0055	2.92	
		Carbon Monoxide	0.0055	2.92	
<b>TOTAL CO EMISSIONS (ton/yr)</b>					

**FORM 2: EMISSION CALCULATIONS OUTSIDE OF MARICOPA COUNTY, CONTINUED**

**4. General Permit Applicability Determination For Internal Combustion Engines while operating outside of Maricopa County**

- a) In order for ADEQ to determine if your crushing/screening operation can be covered under the General Permit, the total Nitrogen Dioxide and Carbon Monoxide emissions from all internal combustion engines can not exceed 90 tons per year, respectively. To determine if the total Nitrogen Oxide and Carbon Monoxide emissions from all internal combustion engines is less than 90 tons per year, sum all the boxes labeled "Total NO<sub>x</sub> Emissions" and "Total CO Emissions" on TABLES 9, 10, 11, 12, 13, and 14 and place the result in TABLE 15 below:
- b) If the total NO<sub>x</sub> or CO emissions in TABLE 15 above are less than 90 ton/yr, the applicant qualifies for coverage under the General Permit.

**TABLE 15: TOTAL NO<sub>x</sub> , and CO EMISSIONS FROM ALL INTERNAL COMBUSTION ENGINES**

EMISSION UNITS	TOTAL NO <sub>x</sub> EMISSIONS (tons/yr)	TOTAL CO EMISSIONS (tons/yr)
Internal Combustion Engines Burning Gasoline (Tables 9 and 10)		
Internal Combustion Engines Less Than Or Equal To 447 KW (600 HP) Burning Diesel (Table s 11 and 12)		
Internal Combustion Engines greater than 447 KW (600 HP) Burning Diesel(Tables 13 and 14)		
<b>TOTAL NO<sub>x</sub> , and CO EMISSIONS FROM ALL INTERNAL COMBUSTION ENGINES (tons/yr)</b>		

- c) If the total NO<sub>x</sub> or CO emissions in TABLE 15 above are greater than 90 ton/yr, the applicant does not qualify for coverage under the General Permit and must submit an application to ADEQ for an individual permit. However, if the applicant can demonstrate that the NO<sub>x</sub> and CO emissions from all internal combustion engines will not exceed 90 tons per year (based upon operating 16 hours per day) then the applicant may qualify for coverage under the General Permit. This shall be demonstrated by the applicant submitting a calculation of the maximum potential to emit for NO<sub>x</sub> and CO using alternative acceptable emission calculation methods.

**FORM 2: EMISSION CALCULATIONS OUTSIDE OF MARICOPA COUNTY, CONTINUED**

**5. General Permit Applicability Determination For Crushing/Screening Operations while operating outside Maricopa County**

- a In order for ADEQ to determine if your crushing/screening operation can be covered under the General Permit, the Total PM<sub>10</sub> Emissions from batch drop operations, feed hoppers, crushers, screens, stackers, transfer points, lime silos, and concrete batch plant operations must be less than 13.64 tons/yr. To determine if the Total PM<sub>10</sub> emissions from the crushing/screening operations is less than 13.64 tons/yr, sum all the boxes labeled "Total PM<sub>10</sub> Emissions" on TABLES 1, 2, 3, 4, 5, 6, 7, and 8 and place the result in TABLE 16 below:

**TABLE 16: TOTAL PM<sub>10</sub> EMISSIONS FROM ALL EMISSION UNITS**

EMISSION UNIT	TOTAL PM <sub>10</sub> EMISSIONS (ton/yr)
Batch Drop Operations (TABLE 1 total)	
Loading of Feed Hoppers (TABLE 2 total)	
Crushers (TABLE 3 total)	
Screens (TABLE 4 total)	
Stackers and Transfer Points (TABLE 5 total)	
Lime Silos (TABLE 6 total)	
Concrete Batch Plant Operations (Truck Mix Concrete) (TABLE 7)	
Concrete Batch Plant Operations (Central Mix Concrete) (TABLE 8)	
<b>TOTAL PM<sub>10</sub> EMISSIONS FROM ALL EMISSION UNITS (ton/yr):</b>	

- b. If the total PM<sub>10</sub> emissions in TABLE 16 are less than 13.64 ton/yr, the applicant qualifies for coverage under the General Permit.
- c. If the total PM<sub>10</sub> emissions in TABLE 16 are greater than 13.64 ton/yr, the applicant does not qualify for coverage under the General Permit and must submit an application to ADEQ for an individual permit.

## FORM 3: EMISSION CALCULATIONS INSIDE MARICOPA COUNTY

### 1. CRUSHING/SCREENING

In order for ADEQ to fully evaluate a General Permit application, the amount of pollution emitted from the crushing/screening operations must be submitted. This section of the manual is intended to guide the applicant through the emission calculations if the applicant intends to operate **inside of Maricopa County**. Emissions from crushing/screening operations consist of Particulate Matter (PM) and PM<sub>10</sub>. PM<sub>10</sub> is particulate matter which has an average diameter less than 10 micrometers. The applicant should make additional copies of any pages necessary to submit the total emissions from all crushing/screening operations.

**Will the applicant operate their Crushing and Screening facility inside of Maricopa County?**

YES     NO    **If the answer is YES, then continue with the emission calculations in FORM 3.  
If the answer is NO, then skip FORM 3 and continue to FORM 4.**

#### a. Calculating Emissions From Batch Drop Operations

- i. Examples of batch drop operations include truck dumping onto a storage pile, loading out from a storage pile to a truck with a front-end loader, or front-end loader dumping onto a storage pile. Batch drop operations do not include the loading of feed hoppers. TABLE 17 has been designed to calculate the emissions from the loading of feed hoppers.
- ii. TABLE 17 must be completed, in order to calculate the PM<sub>10</sub> and PM emissions from batch drop operation(s). To calculate emissions from batch drop operations, the maximum throughput rate of the plant listed in column (a) is multiplied by the emission factors listed in columns (b) and (c) to determine the pound per hour rate of PM<sub>10</sub> and PM.
- iii. Once the emissions have been calculated for all batch drop operations, the emissions must be summed up and placed in the box labeled "Total Emissions".

**TABLE 17: PM AND PM<sub>10</sub> EMISSIONS FROM BATCH DROP OPERATION**

Maximum Throughput Rate (ton/hr)	Emission Factor PM (lb/ton)	Emission Factor PM <sub>10</sub> (lb/ton)	Emission Rate PM (lb/hr)	Emission Rate PM <sub>10</sub> (lb/hr)
(a)	(b)	(c)	(a x b)	(a x c)
	.002	0.00048		
	.002	0.00048		
	.002	0.00048		
<b>TOTAL EMISSIONS (lb/hr):</b>				

**FORM 3: EMISSION CALCULATIONS INSIDE OF MARICOPA COUNTY, CONTINUED**

**b. Calculating Emissions From The Loading Of Feed Hoppers**

- i. TABLE 18 must be completed, in order to calculate the PM<sub>10</sub> and PM emissions from the loading of feed hopper(s). To calculate emissions from the loading of feed hoppers) the maximum throughput rate of the plant listed in column (a) is multiplied by the emission factors listed in columns (b) and (c) to determine the pound per hour rate of PM10 and PM.
- ii. Once the emissions have been calculated for the loading of all feed hoppers, the emissions must be summed up and placed in the box labeled "Total Emissions".

**TABLE 18: PM AND PM10 EMISSIONS FROM THE LOADING OF FEED HOPPERS**

Maximum Throughput Rate (ton/hr) <i>(a)</i>	Emission Factor PM (lb/ton) <i>(b)</i>	Emission Factor PM <sub>10</sub> (lb/ton) <i>(c)</i>	Emission Rate PM (lb/hr) <i>(a x b)</i>	Emission Rate PM <sub>10</sub> (lb/hr) <i>(a x c)</i>
	.002	0.00048		
	.002	0.00048		
	.002	0.00048		
<b>TOTAL EMISSIONS (lb/hr):</b>				

**FORM 3: EMISSION CALCULATIONS INSIDE OF MARICOPA COUNTY, CONTINUED**

**c. Calculating Emissions From Crushers**

- i. TABLE 19 must be completed, in order to calculate the PM<sub>10</sub> and PM emissions from the crusher(s). To calculate emissions from the crusher(s), the maximum throughput rate of the plant listed in column (a) is multiplied by the emission factors listed in columns (b) and (c) to determine the pound per hour rate of PM<sub>10</sub> and PM.
- ii. Primary crushers are defined as any crusher that reduces material to approximately 3 to 12 inches in diameter. Secondary crushers are defined as any crusher that reduces material to approximately 1 to 4 inches in diameter. Tertiary crushers are defined as any crusher that reduces material to approximately 3/16th to 1 inch in diameter.

**TABLE 19: PM AND PM<sub>10</sub> EMISSIONS FROM CRUSHERS**

Maximum Throughput Rate (ton/hr) <i>(a)</i>	Emission Factor PM (lb/ton) <i>(b)</i>	Emission Factor PM <sub>10</sub> (lb/ton) <i>(c)</i>	Emission Rate PM (lb/hr) <i>(a x b)</i>	Emission Rate PM <sub>10</sub> (lb/hr) <i>(a x c)</i>
<b>PRIMARY CRUSHERS</b>				
	0.0012	0.00054		
	0.0012	0.00054		
	0.0012	0.00054		
	0.0012	0.00054		
	0.0012	0.00054		
<b>SECONDARY CRUSHERS</b>				
	0.0012	0.00054		
	0.0012	0.00054		
	0.0012	0.00054		
	0.0012	0.00054		
	0.0012	0.00054		
<b>TERTIARY CRUSHERS</b>				
	0.0012	0.00054		
	0.0012	0.00054		
	0.0012	0.00054		
	0.0012	0.00054		
	0.0012	0.00054		
<b>TOTAL EMISSIONS (lb/hr):</b>				

**FORM 3: EMISSION CALCULATIONS INSIDE OF MARICOPA COUNTY, CONTINUED**

**d. Calculating Emissions From Screens**

- i. TABLE 20 must be completed in order to calculate the PM<sub>10</sub> emissions from the screen(s). To calculate emissions from the screen(s), the maximum throughput rate of the plant listed in column (a) is multiplied by the emission factors listed in columns (b) and (c) to determine the pound per hour rate of PM10 and PM. Once the emissions have been calculated for each screen, the emissions from all the screens must be summed up and placed in the box labeled "Total Emissions".
- ii. Fines screens are defined as any screen that sizes material up to 3/16th inches in diameter.

**TABLE 20: PM AND PM<sub>10</sub> EMISSIONS FROM SCREENS**

Maximum Throughput Rate (ton/hr) <i>(a)</i>	Emission Factor PM (lb/ton) <i>(b)</i>	Emission Factor PM <sub>10</sub> (lb/ton) <i>(c)</i>	Emission Rate PM (lb/hr) <i>(a x b)</i>	Emission Rate PM <sub>10</sub> (lb/hr) <i>(a x c)</i>
<b>SCREENING</b>				
	0.0022	0.00074		
	0.0022	0.00074		
	0.0022	0.00074		
	0.0022	0.00074		
	0.0022	0.00074		
<b>FINE SCREENING</b>				
	0.0036	0.0022		
	0.0036	0.0022		
	0.0036	0.0022		
	0.0036	0.0022		
	0.0036	0.0022		
<b>TOTAL EMISSIONS (lb/hr):</b>				

**FORM 3: EMISSION CALCULATIONS INSIDE OF MARICOPA COUNTY, CONTINUED**

**e. Calculating Emissions From Stackers And Transfer Points**

- i. TABLE 21 must be completed, in order to calculate the PM<sub>10</sub> emissions from the stacker(s) and transfer point(s). To calculate emissions from the stacker(s) the maximum throughput rate of the plant listed in column (a) is multiplied by the emission factors listed in columns (b) and (c) to determine the pound per hour rate of PM10 and PM. To calculate emissions from the transfer point(s), the number of transfer point(s) listed in column (a) is multiplied by the maximum throughput rate, the emission factor, and conversion factors listed in columns (b), and (c). A transfer point is a point of emission where the process material is airborne (e.g. between two conveyors).
- ii. Once the emissions have been calculated for each stacker and transfer point, the emissions from all the stackers and transfer points must be summed up and placed in the box labeled "Total Emissions".

**TABLE 21: PM AND PM<sub>10</sub> EMISSIONS FROM STACKERS AND TRANSFER POINTS**

Serial # or Equipment ID #	Maximum Throughput Rate (ton/hr)	Emission Factor PM (lb/ton)	Emission Factor PM <sub>10</sub> (lb/ton)	Emission Rate PM (lb/hr)	Emission Rate PM <sub>10</sub> (lb/hr)
	(a)	(b)	(c)	(a x b)	(a x c)
<b>STACKERS</b>					
		0.002	0.00048		
		0.002	0.00048		
		0.002	0.00048		
		0.002	0.00048		
		0.002	0.00048		
Number of Transfer Points	Maximum Throughput Rate (ton/hr)	Emission Factor PM (lb/ton)	Emission Factor PM <sub>10</sub> (lb/ton)	Emission Rate PM (lb/hr)	Emission Rate PM <sub>10</sub> (lb/hr)
(a)	(b)	(c)	(d)	(a x b x c)	(a x b x d)
<b>TRANSFER POINTS</b>					
		0.00014	0.000046		
		0.00014	0.000046		
		0.00014	0.000046		
		0.00014	0.000046		
		0.00014	0.000046		
<b>TOTAL EMISSIONS (lb/hr):</b>					

**FORM 3: EMISSION CALCULATIONS INSIDE OF MARICOPA COUNTY, CONTINUED**

**f. Calculating Emissions From Lime Silos**

TABLES 22 and 23 must be completed, in order to calculate the PM<sub>10</sub> and PM emissions from the lime silo operation(s). To calculate emissions from the loading of the lime silo(s), the maximum throughput rate of the plant listed in column (a) is multiplied by the maximum fraction of lime added by weight to the material, the control factor, the emissions factor, and the conversion factor listed in columns (b), (c), and (d). To calculate emissions from the lime discharging onto conveyor belts, the number of discharge point(s) listed in column (a) is multiplied by the maximum throughput rate of the plant, the maximum fraction of lime added by weight to the material, the emission factor, and conversion factor listed in columns (b), (c), and (d). Once the emissions have been calculated for each lime silo and the discharging of lime onto conveyor belts, the emissions from all the lime silo activities must be summed up and placed in the boxes labeled "Total PM<sub>10</sub> Emissions" and "Total PM Emissions" in TABLES 22 and 23.

**TABLE 22:PM<sub>10</sub> EMISSIONS FROM LIME SILOS**

Serial # and Equipment ID #	Maximum Throughput Rate (ton/hr) <i>(a)</i>	Maximum Amount Of Lime Added By Weight ( percentage / 100 ) <i>(b)</i>	Control Efficiency of Baghouse Or Wet Scrubber  ( 1 - [control efficiency/ 100] ) <i>(c)</i>	Emission Factor  (lb/ton) <i>(d)</i>	Emission Rate  (lb/hr) <i>(a x b x c x d)</i>
<b>PNEUMATIC LOADING OF LIME SILO</b>					
				1.1	
				1.1	
				1.1	
				1.1	
Number of Discharge Points  <i>(a)</i>	Maximum Throughput Rate (ton/hr) <i>(b)</i>	Maximum Amount Of Lime Added By Weight ( percentage / 100 ) <i>(c)</i>		Emission Factor  (lb/ton) <i>(d)</i>	Emission Factor  (lb/ton) <i>(d)</i>
<b>DISCHARGING OF LIME ONTO CONVEYOR BELTS</b>					
				0.000046	
				0.000046	
				0.000046	
				0.000046	
<b>Total PM<sub>10</sub> Emissions</b>					

**FORM 3: EMISSION CALCULATIONS INSIDE OF MARICOPA COUNTY, CONTINUED**

**g. Calculating Emissions From Lime Silos, continue**

**TABLE 23:PM EMISSIONS FROM LIME SILOS**

Serial # and Equipment ID #	Maximum Throughput Rate (ton/hr) (a)	Maximum Amount Of Lime Added By Weight ( percentage / 100 ) (b)	Control Efficiency of Baghouse Or Wet Scrubber ( 1 - [control efficiency/ 100] ) (c)	Emission Factor (lb/ton) (d)	Emission Rate (lb/hr) (a x b x c x d)
<b>PNEUMATIC LOADING OF LIME SILO</b>					
				3.14	
				3.14	
				3.14	
				3.14	
Number of Discharge Points (a)	Maximum Throughput Rate (ton/hr) (b)	Maximum Amount Of Lime Added By Weight ( percentage / 100 ) (c)		Emission Factor (lb/ton) (d)	Emission Factor (lb/ton) (d)
<b>DISCHARGING OF LIME ONTO CONVEYOR BELTS</b>					
				0.00014	
				0.00014	
				0.00014	
				0.00014	
<b>Total PM Emissions</b>					

**FORM 3: EMISSION CALCULATIONS INSIDE OF MARICOPA COUNTY, CONTINUED**

**2. Concrete Batch Plant Emissions**

TABLE 24 and/or TABLE 25 must be completed, in order to calculate the PM<sub>10</sub> and PM emissions from concrete batch plants, per yard of truck mix or central mix concrete. To calculate emissions for the overall concrete batch plant, the maximum throughput rate of the plant listed in column (a) is multiplied by the emission factors listed in columns (b) and (c) to determine the pound per hour rate of PM10 and PM. Once the emissions have been calculated for each screen, the emissions from all the screens must be summed up and placed in the box labeled "Total Emissions".

**TABLE 24: PM<sub>10</sub> Emissions from Concrete Batch Plant Operations (Truck Mix Concrete)**

Maximum Throughput Rate (ton/hr) <i>(a)</i>	Emission Factor PM (lb/ton) <i>(b)</i>	Emission Factor PM <sub>10</sub> (lb/ton) <i>(c)</i>	Emission Rate PM (lb/hr) <i>(a x b)</i>	Emission Rate PM <sub>10</sub> (lb/hr) <i>(a x c)</i>
	0.034	0.015		
	0.034	0.015		
	0.034	0.015		
<b>TOTAL EMISSIONS (lb/hr):</b>				

**TABLE 25: PM<sub>10</sub> Emissions from Concrete Batch Plant Operations (Central Mix Concrete)**

Maximum Throughput Rate (ton/hr) <i>(a)</i>	Emission Factor PM (lb/ton) <i>(b)</i>	Emission Factor PM <sub>10</sub> (lb/ton) <i>(c)</i>	Emission Rate PM (lb/hr) <i>(a x b)</i>	Emission Rate PM <sub>10</sub> (lb/hr) <i>(a x c)</i>
	0.028	0.013		
	0.028	0.013		
	0.028	0.013		
<b>TOTAL EMISSIONS (lb/hr):</b>				

**3. General Permit Applicability Determination For Internal Combustion Engines in Maricopa County**

The applicant will determine the potential to emit (PTE) for each internal combustion engine (this does not include mobile sources such as front end loaders). Tables 26 and 27 will be used to determine the pounds per hour of the listed pollutants. Table 26 will be used for all internal combustion engines with a maximum rated capacity greater than or equal to 600 horsepower. Table 27 will be used for all internal combustion engines with a maximum rated capacity less than 600 horsepower. The applicant must use the emission factor appropriate to the fuel used.

**Table 26: Generators with Maximum Capacity of Greater Than 600 Horsepower**

Pollutant (a)	Maximum Capacity (b)	Emission Factor Diesel (c)	Emission Factor Natural Gas/LPG (d)	Emission Factor Gasoline (e)	Emissions b x (c or d or e)
	<i>(horsepower)</i>	<i>(lb/hp-hr)</i>	<i>(lb/hp-hr)</i>	<i>(lb/hp-hr)</i>	<i>(lb/hr)</i>
CO		0.0055	0.0022	0.00696	
NO <sub>x</sub>		0.024	0.03	0.011	
SO <sub>2</sub>		0.0065	0.000004	0.000591	
VOCs		0.0007	0.000826	0.0216	
PM		0.0007	0.000069	0.000721	
PM <sub>10</sub>		0.0007	0.000001	0.000721	

**Table 27: Generators with Maximum Capacity of Less Than or Equal to 600 Horsepower**

Pollutant (a)	Maximum Capacity (b)	Emission Factor Diesel (c)	Emission Factor Natural Gas/LPG (d)	Emission Factor Gasoline (e)	Emissions b x (c or d or e)
	<i>(horsepower)</i>	<i>(lb/hp-hr)</i>	<i>(lb/hp-hr)</i>	<i>(lb/hp-hr)</i>	<i>(lb/hr)</i>
CO		0.0067	0.0022	0.00696	
NO <sub>x</sub>		0.031	0.03	0.011	
SO <sub>2</sub>		0.002	0.000004	0.000591	
VOCs		0.0025	0.000826	0.0216	
PM		0.0022	0.000069	0.000721	
PM <sub>10</sub>		0.0022	0.000001	0.000721	

Table 28 will be used to list the total emissions of each criteria pollutant from all of the generators. Use the numbers calculated in Tables 26 and 27 to fill out the table on the next page.

4. Overall Emissions Summary

**Table 28: Total Facility Emissions from the Generators**

Pollutant	Total Emissions lb/hr
	Totals from Tables 26 and 27
CO	
NO <sub>x</sub>	
SO <sub>2</sub>	
VOC	
PM	
PM <sub>10</sub>	

**TABLE 29: PM<sub>10</sub> and PM Emissions from Crushing and Screening Operations**

EMISSION UNIT	TOTAL PM EMISSIONS (lb/hr)	TOTAL PM <sub>10</sub> EMISSIONS (lb/hr)
Batch Drop Operations (TABLE 17 total)		
Loading of Feed Hoppers (TABLE 18 total)		
Crushers (TABLE 19 total)		
Screens (TABLE 20 total)		
Stackers and Transfer Points (TABLE 21 total)		
Lime Silos (TABLES 22 AND 23 total)		
Concrete Batch Plant Operations (Truck Mix Concrete) (TABLE 24)		
Concrete Batch Plant Operations (Central Mix Concrete) (TABLE 25)		
Internal Combustion Engines (Table 26 and 27)		
<b>TOTAL EMISSIONS FROM ALL EMISSION UNITS (ton/yr):</b>		

**5. Allowable hours of operation determination**

The applicant is required to calculate the number of hours that will limit the daily and yearly nitrogen oxide (NO<sub>x</sub>), volatile organic compounds (VOCs), sulfur dioxide (SO<sub>2</sub>), and particulate matter emissions to 135 pounds per day and 22.5 tons per year, carbon monoxide (CO) emissions to 495 pounds per year and 90 tons per year, and PM<sub>10</sub> emissions to 76.5 pounds per year and 13.5 tons per year while operating in Maricopa County. Tables 28 and 29 will be used to determine the pounds per hour and tons per year of the listed pollutants. Tables 28 and 29 have summed up all of the emissions from all emission points, and these values shall be used in Tables 30 and 31 to determine the hours of operation in Maricopa County on a daily and annual basis.

**Table 30: Allowable hours per day while operating in Maricopa County**

<b>Pollutant</b>	<b>Emission from Tables 28 and 29</b>	<b>Maximum allowable emissions</b>	<b>Maximum allowable hours of operation per day</b>	<b>Maximum allowable hours of operation per year</b>
	<b>(a)</b>	<b>(b)</b>	<b>(c) = (b)/(a)</b>	<b>(d)=(c) x 365</b>
	(lb/hr)	(lb/day)	(hrs/day)	(hr/yr)
NO <sub>x</sub>		135		
CO		495		
PM		135		
PM <sub>10</sub>		76.5		
VOC		135		
SO <sub>2</sub>		135		

The NO<sub>x</sub>, CO, SO<sub>2</sub>, VOC, PM and PM<sub>10</sub> value listed in Table 28 and 29 will be used in Table 30 (column a) to calculate the allowable daily hours of operation while in Maricopa County. The allowable hours of operation per day is calculated by taking maximum allowable emissions in lb/day listed in column (b) and dividing by the total emissions in column (a). The allowable hours of operation per year is calculated by taking the allowable hours of operation per day listed in column (c) and multiplying by 365.

**ALLOWABLE HOURS PER DAY LIMIT CHECKLIST**

Are the smallest allowable hours of operation per day in column (c) of Table 30 greater than 16 hours?

YES     NO    **If the answer is YES**, the maximum allowable hours of operation per day is 16 hrs.

**If the answer is No**, the maximum allowable hours of operation per day is the smallest value from column (c) of Table 30.

**Maximum Allowable Hours of Operation per Day determined by TABLE 30 above:**

\_\_\_\_\_ hr/day

The NO<sub>x</sub>, CO, PM, PM<sub>10</sub>, VOC, and SO<sub>2</sub> values listed in Tables 28 and 29 will be used in Table 31 (column a) to calculate the allowable yearly hours of operation while in Maricopa County. The allowable hours of operation per year listed in Table 30 (column d) will be used in Table 31 (column b). The allowable hours of operation per year, listed in Table 31 (column d), is calculated by first taking the maximum allowable emissions in tons/year listed in column (c) and multiplying by that number 2000 and then dividing by the total emissions in column (a).

**Table 31: Allowable hours per year while operating in Maricopa County**

<b>Pollutant</b>	<b>Emission from Table #</b>	<b>Maximum allowable hours of operation per year (from TABLE 30, column d)</b>	<b>Maximum allowable emissions</b>	<b>Maximum allowable hours of operation per year</b>
	<b>(a)</b>	<b>(b)</b>	<b>(c)</b>	<b>(d)= [(c) x 2000]/(a)</b>
	(lb/hr)	(hr/yr)	(tons/yr)	(hr/yr)
NO <sub>x</sub>			22.5	
CO			90.0	
PM			22.5	
PM <sub>10</sub>			13.5	
VOC			22.5	
SO <sub>2</sub>			22.5	

**ALLOWABLE HOURS PER YEAR LIMIT CHECKLIST**

- A. Are all allowable hours of operation per year in column (b) and column (d) of Table 31 greater than 5,840 hrs?
- YES    NO   **If the answer is YES**, the maximum allowable hours of operation per year is 5,840 hrs.  
**If the answer is No**, proceed to Question B.
- B. Are the allowable hours of operation in column (b) of Table 31 greater than the allowable hours of operation in column (d) of Table 31?
- YES    NO   **If the answer is YES**, the maximum allowable hours of operation per year is the lowest value listed in column (d) of Table 31.  
**If the answer is No**, the maximum allowable hours of operation per year is the lowest value listed in column (b) of Table 31.

**Maximum Allowable Hours of Operation per Year determined by TABLE 31 above:**

\_\_\_\_\_ hr/year

## FORM 4: EMISSION CALCULATIONS, CONTINUED

### FUGITIVE DUST SOURCES

**a. Calculating Emissions From Aggregate Storage Piles**

Table 32 must be completed, in order to calculate the PM<sub>10</sub> emissions from the aggregate storage pile(s). To calculate emissions from the aggregate storage pile(s), the total number of aggregate storage pile(s) listed in column (a) is multiplied by the emission and conversion factors listed in columns (b) and (c).

**TABLE 32: PM<sub>10</sub> EMISSIONS FROM AGGREGATE STORAGE PILES**

Total Number of Aggregate Storage Piles	Emission Factor (lb/hr)	Conversion Factor (ton-hr/Lb-yr)	Emissions (ton/yr)
(a)	(b)	(c)	(a x b x c)
	0.000233	4.38	

**b. Calculating Emissions From Haul Roads**

Table 33 must be completed, in order to calculate the PM<sub>10</sub> emissions from the haul road(s). To calculate emissions from the haul road(s), the average number of vehicle miles traveled, which includes easements, in an hour listed in column (a) is multiplied by the emission and conversion factors listed in columns (b) and (c).

**TABLE 33: PM<sub>10</sub> EMISSIONS FROM HAUL ROADS**

Average Number of Vehicle Miles Traveled in an Hour	Emission Factor (lb/VMT)	Conversion Factor (ton-hr/Lb-yr)	Emissions (ton/yr)
(a)	(b)	(c)	(a x b x c)
	0.167	4.38	



## FORM 6: AIR POLLUTION CONTROLS

1. In order for ADEQ to fully evaluate a General Permit application, the type of air pollution controls utilized must be submitted. This section of the manual is intended to assist the applicant in listing the air pollution controls that are utilized at the plant. TABLE 35 must be completed by check marking each emission point(s) with the appropriate air pollution control device. Generally emissions are controlled with spray bars, sprinkler systems and a water truck. In addition, some operators choose to use a chemical surfactant or dust palliative. Shaded boxes represent air pollution control devices which are typically not utilized with the referenced emission point(s).

**TABLE 35: AIR POLLUTION CONTROLS CHECKLIST FOR THE CRUSING AND SCREENING FACILITY**

AIR POLLUTION CONTROL DEVICE	EMISSION POINT							
	Crushers	Screens	Transfer Points	Stackers	Haul Roads	Storage Piles	Other:	Other:
Spray Bars								
Sprinklers								
Water Truck								
Water Hose								
Venturi Scrubber								
Low-Energy Scrubber								
Baghouse								
Other:								
Other:								

2. For each Venturi Scrubber, Low-Energy Scrubber, or Baghouse please provide the following information. The manufacturer of the control device should be able to provide you with the necessary information including the rated efficiency of the device. If more than one device is used, make copies of this page and complete one for each device:
- a. Type of equipment (e.g. venturi scrubber, low-energy scrubber, baghouse etc.): \_\_\_\_\_
  - b. Rated efficiency of equipment (in percent): \_\_\_\_\_
  - c. If the device has a stack emission point:
    - i. Stack flowrate (cubic feet per second): \_\_\_\_\_
    - ii. Inside diameter of the stack (feet): \_\_\_\_\_

3. In order for ADEQ to fully evaluate a General Permit application, the type of air pollution controls utilized must be submitted. This section of the application is intended to assist the applicant in listing the air pollution controls that are utilized at the plant if it is co-located with a Concrete Batch Plant. TABLE 36 must be completed by check marking each emission point(s) with the appropriate air pollution control device. Generally emissions are controlled with spray bars, sprinkler systems and a water truck. In addition, some operators choose to use a chemical surfactant or dust palliative. Shaded boxes represent air pollution control devices which are typically not utilized with the referenced emission point(s).

**TABLE 36: AIR POLLUTION CONTROLS CHECKLIST FOR THE CONCRETE BATCH PLANT**

AIR POLLUTION CONTROL DEVICE	EMISSION POINT								
	Material Handling (Front End Loaders)	Feed Hoppers	Elevated Bins/ Weigh Hoppers	Cement / Fly Ash Silo	Mixer Loading (Truck Mix)	Mixer Loading (Central Mix)	Transfer Points	Haul Roads	Storage Piles
Spray Bars									
Sprinklers									
Water Truck									
Water Hose									
Baghouse									
Other:									
Other:									

## FORM 7: OPERATION AND MAINTENANCE PLAN

In order for the Applicant to be granted coverage under the Crushing and Screening General Permit, the Applicant must submit and agree to operate in accordance with an acceptable Operation and Maintenance (O&M) plan which identifies the procedures utilized to maintain its air pollution controls. This section of the manual is intended to assist the applicant in the development of their O&M plan. Mark the appropriate boxes that best describe the startup and shutdown procedures, operations plan, and maintenance plan for your crushing/screening operation. If the given descriptions do not describe your operation or have left something out, please fill in the box marked other with this information. The applicant should make additional copies of any pages necessary to submit a complete O&M plan.

### 1. STARTUP AND SHUTDOWN PROCEDURES

#### a. Water Truck

##### i. Startup

Check water supply, inspect nozzles and open all associated valves before startup.

Other: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Not Applicable

##### ii. Shutdown

Inspect nozzles and close all associated valves after shutdown.

Other: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Not Applicable

#### b. Processing Plant Water Spray Dust Suppression

##### i. Startup

Check water supply, inspect nozzles and open all associated valves before startup.

Other: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Not Applicable

**FORM 7: OPERATION AND MAINTENANCE PLAN, CONTINUED**

1. STARTUP AND SHUTDOWN PROCEDURES, CONTINUED

ii. Shutdown

Inspect nozzles and close all associated valves after shutdown.

Other: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Not Applicable

c. Baghouse

i. Startup

Visual inspection of: product lines, vent lines and all fittings, including dust shroud, baghouse blower.

Other: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Not Applicable

ii. Shutdown

Check that all pressurized systems are off.

Other: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Not Applicable

d. Other Control Device:

i. Startup

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

ii. Shutdown

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**FORM 7: OPERATION AND MAINTENANCE PLAN, CONTINUED**

2. OPERATIONS PLAN

a. Water Truck Operation

Water truck to be operated simultaneous with pit and/or yard loading operations. These activities include; earth moving, unpaved haul roads, storage piles and inactive disturbed areas. Water spray application rate will be determined based on the occurrence of visible dust and may vary depending on existing road conditions, traffic, wind, temperature, and precipitation.

Other: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Not Applicable

b. Processing Plant Water Spray Dust Suppression Operation

The water sprays will be utilized to control dust during material processing whenever the material is not adequately wet to prevent visible emissions from occurring in excess of the applicable opacity limits listed in the Crushing and Screening General Permit. Sprays will be located at designated screens, crushers, and transfer points and will be operated as needed to meet the applicable opacity limits listed in the Crushing and Screening General Permit. Visual opacity observations will be made regularly to verify proper functioning of equipment.

Other: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Not Applicable

c. Baghouse Operation

The baghouse will be operated at all times when pertinent equipment is operating. The following parameters shall be monitored and recorded once daily during operation:

- (1) Pressure drop between exhaust and inflow shall be maintained between \_\_\_\_ and \_\_\_\_ inches of water; and
- (2) Damper setting shall be between \_\_\_\_ and \_\_\_\_ percent; and
- (3) Stack exhaust temperature shall be below \_\_\_\_.

Visual opacity observations will be made regularly to verify proper functioning of equipment. When emissions are suspected to approach compliance values, equipment will be checked for problems.

Other: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Not Applicable

**FORM 7: OPERATION AND MAINTENANCE PLAN, CONTINUED**

2. OPERATIONS PLAN, CONTINUED

d. Other Control Device Operation:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

3. MAINTENANCE PLAN

a. Water Truck Maintenance

A safety check and equipment check will be conducted daily. Normal vehicle maintenance will be performed regularly or as needed.

Other: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Not Applicable

b. Processing Plant Water Spray Dust Suppression Maintenance

The spray system will be checked daily for performance. Nozzles and valves will be cleaned or replaced as needed.

Other: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Not Applicable

c. Baghouse Maintenance

Baghouse pressure and temperature gauges, flow meters, and other associated instruments will be checked daily for proper functioning. Abnormal readings will normally detect equipment failures or leaks. Any detected equipment failures will be remedied as soon as possible. Baghouse ducts, hoods, framework, and housing will be checked daily for signs of wear from corrosion, erosion, excessive heat, and excessive moisture when operating. Fan motor, and bearings, shaking device, reverse jet blow rings, valves, and dampers will be lubricated regularly and checked for wear.

Other: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Not Applicable

d. Other Control Device:

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**FORM 8: COMPLIANCE CERTIFICATION AND CERTIFICATION OF TRUTH, ACCURACY, AND COMPLETENESS**

**This certification must be signed by the Responsible Official. Applications without a signed certification will be deemed incomplete.**

I certify that I have knowledge of the facts herein set forth, that the same are true, accurate and complete to the best of my knowledge and belief, and that all information not identified by me as confidential in nature shall be treated by ADEQ as public record. I also attest that I am in compliance with the applicable requirements of the General Permit and will continue to comply with such requirements and any future requirements that become effective during the life of the General Permit. I will present a certification of compliance to ADEQ no less than semiannually and more frequently if specified by ADEQ. I further state that I will assume responsibility for the construction, modification, or operation of the source in accordance with Arizona Administrative Code, Title 18, Chapter 2 and any permit issued thereof.

Typed or Printed Company Name: \_\_\_\_\_

Official Title of Signer: \_\_\_\_\_

Typed or Printed Name of Signer: \_\_\_\_\_

Signature of Responsible Official: \_\_\_\_\_ Date: \_\_\_\_\_

FORM 9: FEE SUMMARY

**FEE RULE SUMMARY FOR CRUSHING/SCREENING PLANT GENERAL PERMITS**

<b>SOURCE</b>			
<b>GENERAL PERMIT</b>			
<b>CLASS II</b>			
<b>TITLE V</b>		<b>NON - TITLE V</b>	
APPLICATION FEE \$500	<u>ANNUAL ADMINISTRATIVE FEE</u> \$4,520	APPLICATION FEE \$500	<u>ANNUAL INSPECTION FEE</u> \$3,020
<p>There is a \$500 fee for facility changes that require the issuance of new Authorizations to Operate. There is no fee for transfers, administrative amendments, or facility change notices that do not require a permit revision. Administrative and Inspection fees are due no later than February 1st of each year.</p>			