



**Year 2009**  
**Air Quality Division**

*ANNUAL AIR EMISSIONS INVENTORY QUESTIONNAIRE*

*Generators*

The 2009 Generators Annual Emissions Inventory Questionnaire includes 4 forms that are required to be completed and submitted to the Air Quality Division. Instructions for each form are included below. Upon completion, submit all forms along with the signature by the Responsible Official of the facility within 90 days of receipt of a letter from the Department to the address below.

#### **FORM 1: Facility General Information**

Complete all fields as requested.

#### **FORM 2: Equipment & Process Data**

- Table 1: List all information on the generators along with the Authorization To Operate (ATO) number for all the permitted equipment. Indicate, if not available.
- Table 2: Provide details of each stack.

#### **FORM 3: Emissions Data** *Input all calculation results in the appropriate spaces provided in the form.*

Based on the type of fuel used, (Gasoline, Diesel, or Natural Gas/Liquid Propane), choose the appropriate table to input the generator horsepower and hours of operation during the calendar year 2009. To calculate the emission, you take the horsepower multiply the hours operated, multiply by pollutant emission factor, and divide by 2000.

***A sample of the calculations are provided at the bottom of Form 2.***

#### **FORM 4: Summary & Certification**

A summarization of all the emissions by each pollutant will be listed within this form. All reports submitted to the Department should be certified true and accurate by the Responsible Official of the facility. This person is the owner or operator of the facility. **If there is a change of the Responsible Official of the facility, please notify the Department with an additional letter stating the change.**

If you have any question or have difficulty completing this form, please contact Darlene Celaya at (602) 771-7662. Remember to make photocopies of the completed questionnaire prior to mailing for your records/reference. Please mail the emission inventory questionnaire form to the following address:

**Arizona Department of Environmental Quality  
Attention: Darlene Celaya, Emission Inventory Team  
Air Quality Division, Compliance Section 3415A-3  
1110 West Washington Street  
Phoenix, AZ 85007**

**FORM 1: FACILITY GENERAL INFORMATION** **YEAR 2009**

**SECTION I: Plant Identification & Mailing Information**

Company Name: \_\_\_\_\_

Place Name: \_\_\_\_\_ Place ID #: \_\_\_\_\_

Mailing Address: \_\_\_\_\_ City: \_\_\_\_\_ State: \_\_\_\_\_

County: \_\_\_\_\_ Zip Code: \_\_\_\_\_

Phone: \_\_\_\_\_ Fax: \_\_\_\_\_

Permit # or LTF #: \_\_\_\_\_ General Permit: Yes  No

**SECTION II: Emissions Inventory Contact**

Name: \_\_\_\_\_ Title: \_\_\_\_\_

Phone: \_\_\_\_\_ Fax: \_\_\_\_\_

E-mail Address: \_\_\_\_\_

**SECTION III: Confidential Request**

Pursuant to Arizona Revised Statutes §49-432 and §49-201, do you claim the Emissions Inventory data submittal confidential. Yes  No

If yes include which portions of the inventory are confidential along with a brief explanation:

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

**FORM 2: EQUIPMENT, PROCESS & STACK DATA**

**YEAR 2009**

**Table 1: Equipment List**

	Generator #1	Generator #2	Generator #3	Generator #4
Equipment ID				
ATO#				
Max. Rated Capacity				
Hours of Operation				

**Table 2: Stack Information**

	Stack #1	Stack #2	Stack #3	Stack #4
Height (feet)				
Diameter (feet)				
Velocity (feet/second)				
Exhaust Gas Temperature (F)				
Flow Rate (actual cubic feet per minute)				

Sample Emission Calculation: Emissions = Capacity (hp) x Hours of Operation (hrs) x Emission Factor (Pounds per hp-hour)  
2000 pounds per ton

For a Generator of capacity 400hp and using Gasoline fuel and operated for 1500 hours during the year 2009, the emissions of Nitrogen Oxides (NOx) will be as follows:

$$\text{Emissions} = 400 \text{ hp} \times 1500 \text{ hours} \times \frac{0.011 \text{ pounds}}{\text{hp-hr}} = 3.3 \text{ tons per year}$$

2000 pounds per ton

**FORM 3: EMISSIONS CALCULATIONS      YEAR 2009**

	<i>FUEL - GASOLINE</i>				<i>FUEL - NATURAL GAS OR LIQUIFIED PETROLEUM GAS</i>			
	<b>Generator #1</b>		<b>Generator #2</b>		<b>Generator #1</b>		<b>Generator #2</b>	
	Max. Capacity (HP) (1)	Operational Hours (hours/year) (2)	Max. Capacity (HP) (4)	Operational Hours (hours/year) (5)	Max. Capacity (HP) (1)	Operational Hours (hours/year) (2)	Max. Capacity (HP) (4)	Operational Hours (hours/year) (5)
Pollutants	Emission Factor (3) pounds/hp-hour	Emissions = (1)x(2)x(3)/2000 tons/year	Emission Factor (6) pounds/hp-hour	Emissions = (4)x(5)x(6)/2000 tons/year	Emission Factor (3) pounds/hp-hour	Emissions = (1)x(2)x(3)/2000 tons/year	Emission Factor (6) pounds/hp-hour	Emissions = (4)x(5)x(6)/2000 tons/year
PM	0.0007		0.0007		0.0001		0.0001	
PM10	0.0007		0.0007		0.0001		0.0001	
NOx	0.0110		0.0110		0.0206		0.0206	
SOx	0.0060		0.0060		4.35E-06		4.35E-06	
VOC	0.0220		0.0220		0.0008		0.0008	
CO	0.4390		0.4390		0.0029		0.0029	
1,3-Butadiene	-	-	-	-	1.69E-06		1.69E-06	
Acetaldehyde	-	-	-	-	7.10E-06		7.10E-06	
Acrolein	-	-	-	-	6.70E-06		6.70E-06	
Benzene	-	-	-	-	4.02E-06		4.02E-06	
Butyr/isobutyraldehyde	-	-	-	-	1.24E-07		1.24E-07	
Carbon Tetrachloride	-	-	-	-	4.51E-08		4.51E-08	
Chlorobenzene	-	-	-	-	3.28E-08		3.28E-08	
Chloroform	-	-	-	-	3.49E-08		3.49E-08	
1,1-Dichloroethane	-	-	-	-	2.88E-08		2.88E-08	
1,2-Dichloroethane	-	-	-	-	2.88E-08		2.88E-08	
1,2-Dichloropropane	-	-	-	-	3.31E-09		3.31E-09	
1,3-Dichloropropene	-	-	-	-	3.23E-08		3.23E-08	
Ethane	-	-	-	-	1.79E-04		1.79E-04	
Ethylbenzene	-	-	-	-	6.31E-08		6.31E-08	
Ethylene Dibromide	-	-	-	-	5.42E-08		5.42E-08	
Formaldehyde	-	-	-	-	5.22E-05		5.22E-05	
Methane	-	-	-	-	5.86E-04		5.86E-04	
Methanol	-	-	-	-	7.79E-06		7.79E-06	
Methylene Chloride	-	-	-	-	1.05E-07		1.05E-07	
Naphthalene	-	-	-	-	2.47E-07		2.47E-07	
Styrene	-	-	-	-	3.03E-08		3.03E-08	
1,1,2-Trichloroethane	-	-	-	-	3.90E-08		3.90E-08	
Toluene	-	-	-	-	1.42E-06		1.42E-06	
Vinyl Chloride	-	-	-	-	1.83E-08		1.83E-08	
Xylene	-	-	-	-	4.96E-07		4.96E-07	

**FORM 3: EMISSIONS CALCULATIONS      YEAR 2009**

	<i>FUEL - DIESEL - LESS THAN OR EQUAL TO 600 HP</i>				<i>FUEL - DIESEL - GREATER THAN 600 HP</i>			
	<b>Generator #1</b>		<b>Generator #2</b>		<b>Generator #1</b>		<b>Generator #2</b>	
	Max. Capacity (HP) (1)	Operational Hours (hours/year) (2)	Max. Capacity (HP) (4)	Operational Hours (hours/year) (5)	Max. Capacity (HP) (1)	Operational Hours (hours/year) (2)	Max. Capacity (HP) (4)	Operational Hours (hours/year) (5)
Pollutants	Emission Factor (3) pounds/np-hour	Emissions = (1)x(2)x(3)/2000 tons/year	Emission Factor (6) pounds/np-hour	Emissions = (4)x(5)x(6)/2000 tons/year	Emission Factor (3) pounds/np-hour	Emissions = (1)x(2)x(3)/2000 tons/year	Emission Factor (6) pounds/np-hour	Emissions = (4)x(5)x(6)/2000 tons/year
PM	0.0022		0.0022		0.0007		0.0007	
PM10	0.0022		0.0022		0.0006		0.0006	
NOx	0.0310		0.0310		0.0240		0.0240	
SOx	0.0021		0.0021		0.0073		0.0073	
VOC	0.0025		0.0025		0.0007		0.0007	
CO	0.0067		0.0067		0.0055		0.0055	
Acenaphthene	9.94E-09		9.94E-09		3.28E-08		3.28E-08	
Acenaphthylene	3.54E-08		3.54E-08		6.46E-08		6.46E-08	
Acetaldehyde	5.37E-06		5.37E-06		1.76E-07		1.76E-07	
Acrolein	6.48E-07		6.48E-07		5.52E-08		5.52E-08	
Anthracene	1.31E-08		1.31E-08		8.61E-09		8.61E-09	
Benzene	6.53E-06		6.53E-06		5.43E-06		5.43E-06	
Benzo(a)anthracene	1.18E-08		1.18E-08		4.35E-09		4.35E-09	
Benzo(a)pyrene	1.32E-09		1.32E-09		1.80E-09		1.80E-09	
Benzo(b)fluoranthene	6.94E-10		6.94E-10		7.77E-09		7.77E-09	
Benzo(g,h,i)perylene	3.42E-09		3.42E-09		3.89E-09		3.89E-09	
Benzo(k)fluoranthene	1.09E-09		1.09E-09		1.53E-09		1.53E-09	
1,3-Butadiene	2.74E-07		2.74E-07		-		-	
Chrysene	2.47E-09		2.47E-09		1.07E-08		1.07E-08	
Dibenz(a,h)anthracene	4.08E-09		4.08E-09		2.42E-09		2.42E-09	
Fluoranthene	5.33E-08		5.33E-08		2.82E-08		2.82E-08	
Fluorene	2.04E-07		2.04E-07		8.96E-08		8.96E-08	
Formaldehyde	8.26E-06		8.26E-06		5.52E-07		5.52E-07	
Indeno(1,2,3-cd)pyrene	2.63E-09		2.63E-09		2.90E-09		2.90E-09	
Naphthalene	5.94E-07		5.94E-07		9.10E-07		9.10E-07	
Phenanthrene	2.06E-07		2.06E-07		2.86E-07		2.86E-07	
Propylene	1.81E-05		1.81E-05		1.95E-05		1.95E-05	
Pyrene	3.35E-08		3.35E-08		2.60E-08		2.60E-08	
Toluene	2.86E-06		2.86E-06		1.97E-06		1.97E-06	
Xylene	2.00E-06		2.00E-06		1.35E-06		1.35E-06	

**FORM 4: SUMMARY & CERTIFICATION****YEAR 2009**

All the emissions for each pollutant are totalled and entered in the table below.

<b>Pollutant</b>	<b>Tonnage (tons per year)</b>
Particulate Matter (PM)	
Particulate Matter Less Than 10 Microns (PM10)	
Nitrogen Oxides (NOx)	
Sulfur Oxides (SOx)	
Volate Organic Compounds (VOC)	
Carbon Monoxide (CO)	
Hazard Air Pollutants (HAPs)	

**Certification of Truth & Accuracy**

I certify that based on information and belief formed after reasonable inquiry, the statements and information in the document are true, accurate, and complete. All information not identified by me as confidential in nature shall be treated by the Arizona Department of Environmental Quality as public record.

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

Print Name: \_\_\_\_\_

Title: \_\_\_\_\_