

TECHNICAL SUPPORT DOCUMENT

July, 2012

I. SOURCE DESCRIPTION

The source is a federal correctional complex which operates five natural gas fired boilers, several emergency generators and a commercial boiler. The primary pollutants emitted from this source are NO_x, CO, SO_x, PM₁₀, and VOC. The source will emit levels of these criteria pollutants less than major source thresholds by accepting a *Synthetic Minor Limitation* of operating hours for the emergency generators.

No add-on air pollution control devices are required by this permit.

II. EMISSION ESTIMATES

Based on standard EPA AP-42 emission factors the sum of all emissions from the source operating under this permit shall be less than or equal to the following rates:

Pollutant	Emissions (tons/yr)
NO _x	90.0
CO	26.7
SO _x	26.0
PM ₁₀	3.2
VOC	3.1
HAPs (total)	0.2

Based on these estimates, the facility covered by this permit shall be a **Class III, Synthetic Minor, Stationary Source**.

III. APPLICABLE REQUIREMENTS

A. NSPS

No NSPS regulations apply to the source.

The maximum capacity of each boiler is below 10 MMBtu and therefore the units are not subject to the NSPS Subpart Dc.

The generators are not subject to the NSPS Subpart IIII pursuant to 40 CFR 60.42000(a)(2)(i); The units were manufactured before April 1, 2006 and not ordered, reconstructed or modified after July 11, 2005.

The generators are not subject to the NSPS Subpart JJJJ pursuant to 40 CFR 60.4230; the units were not ordered, installed, modified or installed after June 12, 2006.

B. NESHAP

No NESHAP regulations apply to the source.

The generators are not subject to the NSPS Subpart ZZZZ pursuant to 63.6590(b)(3). PDEQ considers these emergency stationary RICE to be located at an institutional facility. Institutional emergency stationary RICE means an emergency stationary RICE used in institutional establishments such as medical centers, research centers, and institutions of higher education

C. Pima County Code (PCC) –The following PCC rules apply:

- 17.16.010 Local Rules and Standards; Applicability of more than one Standard
- 17.16.040 Standards and Applicability (Includes NESHAP)
- 17.16.050 Visibility Limiting Standard
- 17.16.165 Standards of Performance for Fossil-Fuel Fired Industrial and Commercial Equipment
- 17.16.340 Standards of Performance for Stationary Rotating Machinery

IV. PERMIT CONTENTS

A. Applicability

The source is required to obtain a permit solely for the Stationary Rotating Machinery (emergency generator(s)) maintained at the facility, pursuant PCC 17.12.340.B.3.a; and is subject to regulation of Fossil-Fuel Fired Industrial and Commercial Equipment (boiler(s)) pursuant PCC 17.16.165.A.

B. Operational Limitation

The conditions of the permit allow for continuous operation of boilers (24 hours a day, 7 days a week, 365 days a year; or otherwise stated as 8760 hours a year.) In order to avoid classification as a major source (potentially emitting ≥ 100 tons of criteria pollutants) and the associated increase in regulatory stringency, the Permittee must voluntarily agree to restrict the total hours which the generators will be run in any given year. Any restriction in operating hours is documented in Attachment 2. The restriction ensures that the source will not exceed the threshold for major source classification. The Permittee demonstrates compliance with this restriction to Pima County Department of Environmental Quality (PDEQ) by keeping complete records of the time periods in which the generator is operated.

C. Opacity Standard

By law, the Permittee cannot allow any equipment under his control to emit effluents (such as exhaust from a generator or boiler) that exceed specific values of opacity (the degree to which light cannot pass through the plume of effluent/exhaust.) The value of opacity that cannot be exceeded is stated in the permit for each piece of equipment. The Permittee demonstrates compliance with this regulation to PDEQ by checking the exhaust from the generators and boiler under his control quarterly, and keeping complete records of these checks.

D. Fuel Limitation

Each type of fuel burned in equipment powered by combustion has a unique blend of constituents. When burned, each fuel results in the release of regulated pollutants to the atmosphere at characteristic levels. This permit is written to account for only the fuels specified in Attachment 2. Use of fuels other than those specified would result in different rates of pollutant emission. Therefore, the Permittee must

only burn the designated fuels found in Attachment 2 to remain in compliance with the conditions of this permit.

E. Facility Changes

The Permittee retains the ability to modify operations at the facility. However, the permit covering the facility must reflect the current state of operations *at all times*. Therefore, provisions have been made in the Pima County Code to allow changes in operating permits to reflect new facility conditions. The proper procedure must be followed when making certain modifications to the facility, and the permit. See the rules referenced in the permit for enumeration of these requirements.

V. Alternate Operating Scenarios

There are no alternate operating scenarios for pieces of equipment covered by this permit.

VI. Miscellaneous Comments

A. Sulfur Dioxide:

The requirement in PCC 17.16.340.J to report daily periods when the fuel sulfur content of the fuel being fired exceeds 0.8% by weight has not been included in the permit as all fuel that is delivered to Pima County has an enforceable limit of 0.9% by weight. Any fuel over 0.8% but below 0.9% would not be an exceedance of any standard or limitation and so it would be burdensome for sources to report every time the fuel had a sulfur content above 0.8%. An excess emissions report would be submitted should the fuel exceed the 0.9% sulfur content standard. This permit will not allow the use of high sulfur diesel. Moreover, even though the sulfur content limit is 0.9% by weight, jet fuel, natural gas, gasoline and low sulfur diesel #2 delivered to Pima County consistently shows sulfur levels below this limit as shown in past records of fuel supplier specifications which verify sulfur content of the fuel fired. The limitations of IV.A.1 and IV.B.1, of the Specific Conditions, will ensure high sulfur fuel is not fired allowing the omission of rules PCC 17.16.340.H and 17.16.165.G, as well. These rules are incorporated by reference in Attachment 1.

Compliance with the fuel limitation requirements of IV.A.1 and IV.B.1, of the Specific Conditions, shall ensure compliance with the Sulfur Dioxide Standards of PCC 17.16.340.F and 17.16.165.E; which limit the emission of SO₂ to 1.0 pound per million BTU heat input, when burning low sulfur fuel. The definition of low sulfur fuel (PCC 17.04.340.A. "Low Sulfur Fuel") is fuel oil containing less than 0.9 percent sulfur by weight. EPA AP-42 Appendix A, page A-5 states the heating value of diesel fuel is 137,000 BTU per gallon. Thus, 1 million BTU of heat input is equivalent to 7.3 gallons of diesel. At 7.05 lbs per gallon, 51.47 lbs of diesel will produce 1 million BTU. At 0.9% 51.47 lbs of diesel contains 0.46 lbs of sulfur. Combined with Oxygen to form SO₂, and assuming 100% of the sulfur in the fuel forms SO₂, this would yield 0.92 lb SO₂ per 1MMBtu.¹ Thus, low sulfur fuel oil will produce 0.92 lbs of SO₂ per million BTU of heat input. This is roughly 8% less than the prescribed 1.0 pound SO₂ per million BTU (PCC 17.16.340.F and 17.16.165.E). Likewise, distillate, residual, and other such fuel oils range from 0.84 to 0.94 lbs of SO₂ per million BTU. Thus, it is not necessary to include the standards in the permit explicitly but, by reference in Attachment 1.

¹ The atomic weight of SO₂ = 64; the atomic weight of S = 32. SO₂ = (S) x (SO₂/S);
(0.46 lb/MMBtu) x (64/32) = 0.92 lb SO₂

B. Particulate Matter:

PCC 17.16.340.C.1 limits the emissions of particulate matter from stationary rotating machinery. This rule has not been included in the permit as allowable emissions are well above potential emissions. The chart in Figure 1, below, illustrates the fact.

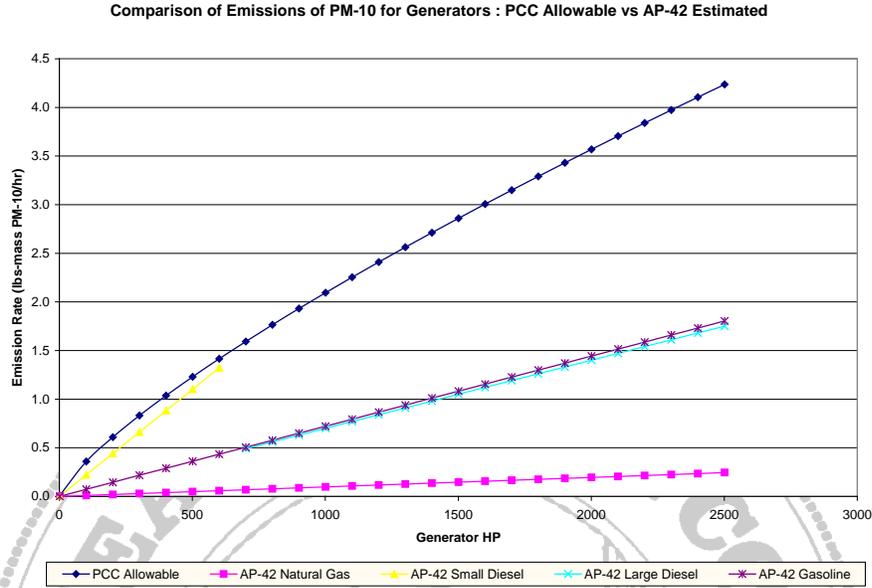
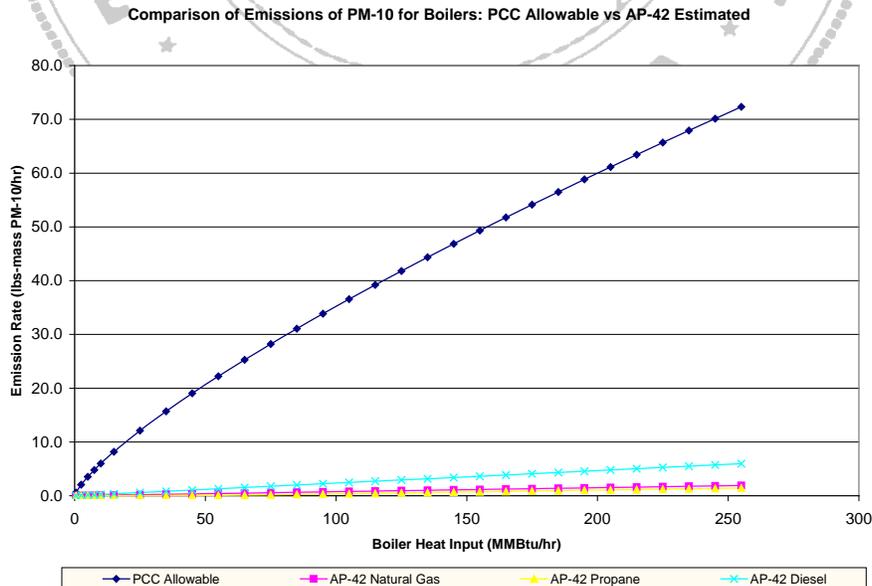


Figure 1) Comparative Chart of Allowable Particulate Emissions Under Pima County Code, Title 17 and Estimated Potential Emissions based on EPA AP-42 Estimates for Stationary Rotating Machinery. EPA AP-42 estimated emissions are demonstrably less than allowable emissions; and with the exception of small diesel engines, AP-42 estimated emissions are significantly less than the allowable emissions.² Therefore, it is not necessary to include the standard in the permit explicitly, but by reference in Attachment 1.



² At 599 hp the allowable emissions rate is 1.41 lb/hr while AP-42 estimates 1.32 lb/hr.

Figure 2) Comparative Chart of Allowable Particulate Emissions Under Pima County Code, Title 17, and Estimated Potential Emissions based on EPA AP-42 Estimates for External Combustion Sources. Allowable emissions are consistently over ten times estimated potential emissions. Therefore, it is not necessary to include the standard in the permit explicitly, but by reference in Attachment 1.

Likewise, PCC 17.16.165.C limits the emissions of particulate matter from commercial and industrial fossil-fuel fired equipment (including but not limited to boilers.) This rule has not been included in the permit as allowable emissions are consistently over an entire order of magnitude higher than EPA AP-42 estimated potential emissions. The chart in Figure 2, above, illustrates the point.

VII. IMPACTS TO AMBIENT AIR QUALITY

Only major sources are required to conduct impacts to ambient air quality and major sources are excluded from this permit.

VIII. CONTROL TECHNOLOGY DETERMINATION

Control Technologies are not required for the source.

