

**UNIVERSITY MEDICAL CENTER CORPORATION: UMC-ARIZONA CANCER CENTER CLINIC**

**TECHNICAL SUPPORT DOCUMENT**

**I. SOURCE DESCRIPTION**

The Arizona Cancer Center Clinic is a medical complex which operates one generator and two commercial/institutional boilers. The primary pollutants emitted from this source are NO<sub>x</sub>, CO, SO<sub>x</sub>, PM<sub>10</sub>, and VOC. The source will emit levels of these criteria pollutants less than major source thresholds by design.

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

**II. EMISSION ESTIMATES**

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

Pollutant	Emissions (tons/yr)
NO <sub>x</sub>	80.6
CO	19.6
SO <sub>x</sub>	26.6
VOC	2.5
PM <sub>10</sub>	2.4

Based on these estimates, the Arizona Cancer Center Clinic is a **Class III, True Minor, Stationary Source**.

**III. APPLICABLE REQUIREMENTS**

**A. NSPS**

No NSPS regulations apply to the source.

**B. NESHAP**

No NESHAP regulations apply to the source.

**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 Arizona Cancer Center is required to obtain a permit for the Stationary Rotating Machinery (one generator) and Fossil Fuel Fired Equipment (two boilers) maintained at the facility, pursuant to PCC 17.12.140.B.3.b & c. The generators and boiler operated at the facility are subject to the regulations of PCC 17.16.340 and PCC 17.16.165, respectively.

**B. Opacity Standard**

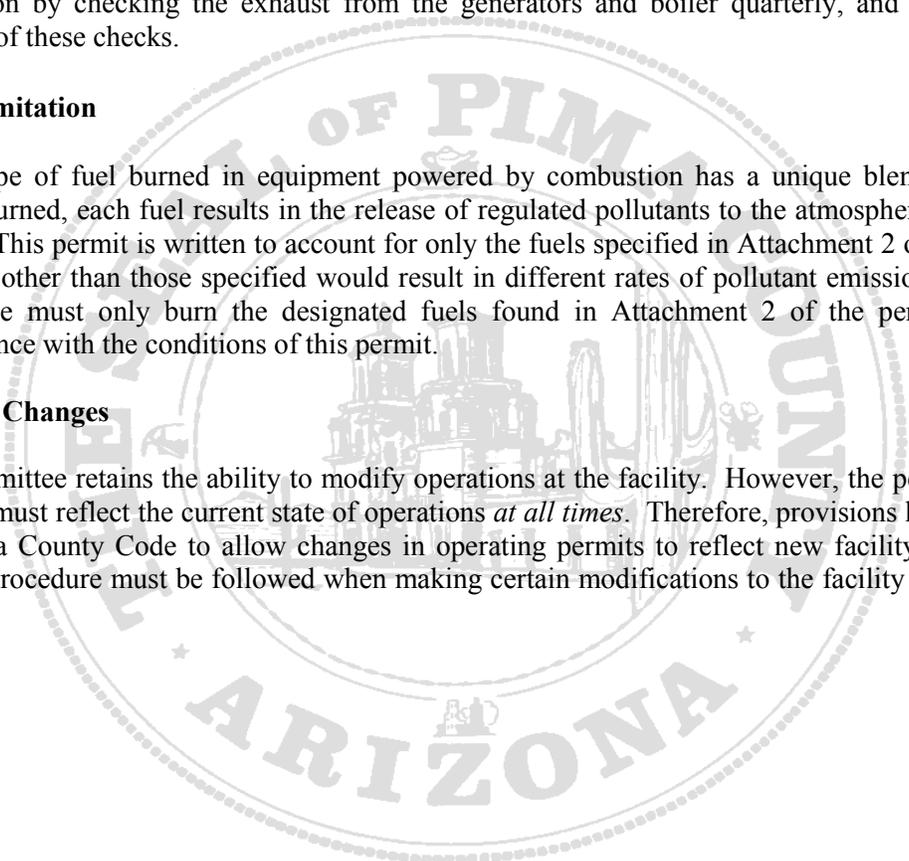
By law, the Permittee cannot allow any equipment under his control to emit effluents (such as exhaust from a generator or boiler) that exceed specific values of opacity (the degree to which light cannot pass through the plume of effluent/exhaust.) The specific value of opacity that effluent from each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

**C. 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 of the permit. 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 of the permit to remain in compliance with the conditions of this permit.

**D. 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 that will affect air quality.



## V. Alternate Operating Scenarios

There are no alternate operating scenarios proposed by University Medical Center Corporation.

## 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 in 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 PCC 17.16.165.G, as well. These rules are incorporated by reference in Attachment 1 of the permit.

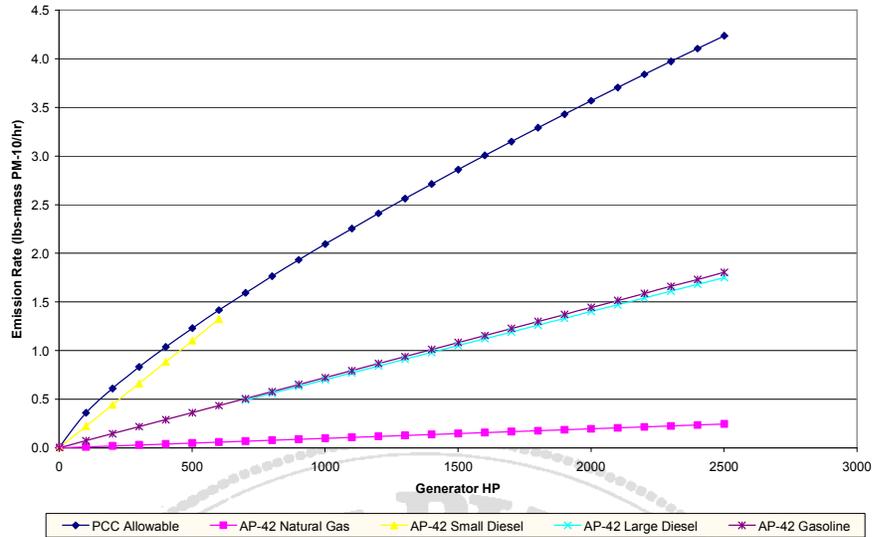
Compliance with the fuel limitation requirements of III.A.1 and III.B.1, of the Specific Conditions, shall ensure compliance with the Sulfur Dioxide Standards of PCC 17.16.340.F and PCC 17.16.165.E; which limit the emission of SO<sub>2</sub> to 1.0 pound per million BTU heat input, when burning low sulfur 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 SO<sub>2</sub>, and assuming 100% of the sulfur in the fuel forms SO<sub>2</sub>, this would yield 0.92 lb SO<sub>2</sub> per 1MMBtu.<sup>1</sup> Thus, low sulfur fuel oil will produce 0.92 lbs of SO<sub>2</sub> per million BTU of heat input. This is roughly 8% less than the prescribed 1.0 pound SO<sub>2</sub> per million BTU (PCC 17.16.340.F and PCC 17.16.165.E). Likewise, distillate, residual, and other such fuel oils range from 0.84 to 0.94 lbs of SO<sub>2</sub> per million BTU. Thus, it is not necessary to include the standards in the permit explicitly but, by reference in Attachment 1 of the permit.

### 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 EPA AP-42 estimated potential emissions. The chart in Figure 1, page 4, illustrates the point.

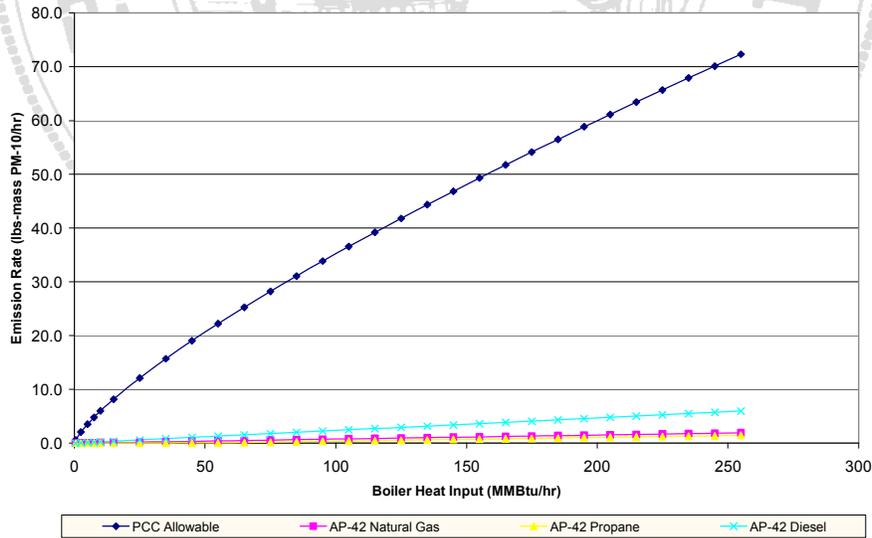
<sup>1</sup>The atomic weight of SO<sub>2</sub> = 64; the atomic weight of S = 32. SO<sub>2</sub> = (S) x (SO<sub>2</sub>/S); (0.46 lb/MMBtu) x (64/32) = 0.92 lb SO<sub>2</sub>

Comparison of Emissions of PM-10 for Generators : PCC Allowable vs AP-42 Estimated



**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.<sup>2</sup> Therefore, it is not necessary to include the standard in the permit explicitly, but by reference in Attachment 1.

Comparison of Emissions of PM-10 for Boilers: PCC Allowable vs AP-42 Estimated



**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.

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

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, page 4, illustrates the point.

## **VII. IMPACTS TO AMBIENT AIR QUALITY**

Only major sources are required to conduct impacts to ambient air quality, and the Arizona Cancer Center is not a major source.

## **VIII. CONTROL TECHNOLOGY DETERMINATION**

Control Technologies are not required for the source.

