

TMC HEALTHCARE

AIR QUALITY PERMIT 971

TECHNICAL SUPPORT DOCUMENT (TSD)

I. GENERAL COMMENTS:

A. Company Information

1. Source Name: Tucson Medical Center (TMC) Healthcare
2. Source Address: 5301 E. Grant Road, Tucson, AZ 85712

B. Background

The facility operates under the following industrial classification: General Medical and Surgical Hospitals – SIC code 8062 (NAICS 621999)

TMC Healthcare currently operates under a Class II air quality permit. It is considered a true minor source of criteria pollutants, and an areas source of HAPs.

This TSD was updated for the renewal of the permit. The renewal application was received on February 5, 2008. The renewal includes information from various updates and a minor revision dated May 17th, 2012.

C. Attainment Classification

The TMC Healthcare is located in an area that is in attainment for all pollutants.

II. SOURCE DESCRIPTION

A. Process Description

TMC Healthcare provides a variety of medical services to the community. TMC Healthcare operates three boilers and 6 large capacity emergency generators, and 6 smaller capacity emergency generators in support of its operations.

The boilers have been manufactured to fire either natural gas or distillate fuel oil. The source has reported that the primary fuel for the boilers is natural gas. The emergency generators are fired with diesel fuel, with the exception of one 101 hp unit that is fired using propane.

B. Operating Capacity and Schedule

The operating schedule at the facility is not limited and the facility and equipment is permitted for operation 7/days/week, 24 hours a day, 365 days a year

C. Air Pollution Control Equipment

No post combustion air pollution control equipment is being operated on the generators or boilers

III. REGULATORY HISTORY

TMC Healthcare is currently in compliance with all Pima County Code requirements.

IV. EMISSIONS ESTIMATES

Emission estimates for TMC Healthcare were derived using emission factors from AP-42 tables. AP-42 tables 3.3-1 thru 3 and 3.4-1 thru 4 (Diesel Industrial Engines and Large Stationary Diesel Engines) were used for emergency generator emission factors and adjusted for NSPS affected units where applicable. For the boilers, the highest emission factors for diesel or natural gas were used from AP-42 tables 1.3-1 and 2, the controlled SO_x emission factor was adjusted per AP-42 Table 1.3-1 to burning distillate fuel oils containing no greater than 0.5% by weight Sulfur.

Federal requirements currently limit “emergency” designated generators to operate no more than 100 hours of operation for maintenance and readiness testing and limited usage for non-emergency purposes, while there is no limit on hours of operation during true emergencies.

In accordance with the federal limits, the controlled facility-wide PTE has been calculated using 100 hours of operation for each generator. Operation of the boilers using fuel that meets the fuel sulfur content limits and limiting the generators to less than 100 hours of operation, results in the boilers requiring a limitation on the annual volume of fuel oil fired to avoid classification as a major source requiring a Class I permit.

The following tables outline TMC Healthcare’s potential to emit controlled and uncontrolled air pollutants.

Uncontrolled ¹ Facility-Wide Potential Emissions of Pollutants (tons/yr)										
Conventional or Criteria Air Pollutant								NSPS	HAPs	
PM _{2.5}	PM ₁₀	PM	NO _x	VOC	CO	SO ₂	Lead	N/A	Total	Single
5.89	7.99	11.61	143.88	5.64	47.18	182.50	ND ²	N/A	0.60	< 0.60

¹ Boilers operating 8760 hrs/yr (0.9% wt. S fuel oil), Emergency generators operating 500 hours.

² No Data. These emissions are insignificant

Controlled ¹ Facility-Wide Potential Emissions of Pollutants (tons/yr)										
Conventional or Criteria Air Pollutant								NSPS	HAPs	
PM _{2.5}	PM ₁₀	PM	NO _x	VOC	CO	SO ₂	Lead	N/A	Total	Single
2.03	2.99	4.73	35.99	1.54	18.90	90.04	ND ²	N/A	0.33	< 0.33

¹ Emergency generator engine PTE is calculated on limited operation of the emergency generators (100 hrs/year). Boiler PTE is calculated on limited operation (5100 hrs when firing fuel oil containing less than 0.5% wt. Sulfur).

² No Data. These emissions are insignificant.

V. APPLICABLE REQUIREMENTS

40 CFR, Part 60 Standards of Performance for New Stationary Sources

- Subpart A General Provisions
- Subpart Dc NSPS for Small Industrial-Commercial-Institutional Steam Generating Units
- Subpart III NSPS for Stationary Compression Ignition Internal Combustion Engines
- Appendix A Test Methods

Pima County Code Title 17, Chapter 17.12 – Permits and Permit Revisions

Article I – General Provisions

- 17.12.010 Statutory Authority
- 17.12.020 Planning, Constructing, or Operating Without a Permit
- 17.12.040 Reporting requirements
- 17.12.045 Test methods and procedures
- 17.12.050 Performance tests
- 17.12.080 Permit Display or Posting

Article II – Individual Source Permits

- 17.12.165 Permit application processing procedures for Class II and Class III permits
- 17.12.185 Permit contents for Class II and Class III permits
- 17.12.235 Facility Changes that require a permit revision
- 17.12.240 Procedures for certain changes that do not require a permit revision Class II or Class III
- 17.12.255 Minor Permit Revision
- 17.12.260 Significant Permit Revision
- 17.12.270 Permit Reopenings – Revocation and reissuance – Termination
- 17.12.350 Material permit condition

Article VI – Individual Source Permits

- 17.12.520 Fees related to Class II and Class III permits

Pima County Code Title 17, Chapter 17.16 – Emission Limiting Standards

Article I – General Provisions

- 17.16.010 Local rules and standards; Applicability of more than one standard
- 17.16.020 Noncompliance with applicable standards
- 17.16.030 Odor limiting standards

Article II – Visible Emission Standards

- 17.16.040 Standards and applicability (includes NESHAP)
- 17.16.050 Visibility limiting standard

Article IV – New and Existing Stationary Source Performance Standards

- 17.16.130 Applicability
- 17.16.165 Standards of performance for fossil-fuel fired industrial commercial equipment
- 17.16.340 Standards of performance for stationary rotating machinery
- 17.16.430 Standards of performance for unclassified sources

Pima County Code Title 17, Chapter 17.20 – Emissions Source Testing and Monitoring

- 17.20.010 Source sampling, monitoring and testing
- 17.20.040 Concealment of emissions

Pima County Code Title 17, Chapter 17.24:

- 17.24.020 Recordkeeping for compliance determination

VI. REQUIREMENTS SPECIFICALLY IDENTIFIED AS NON-APPLICABLE

1. 40 CFR Part 63 NESHAP Subpart JJJJJ has been identified as non-applicable since the boilers will be operated as gas-fired boilers. Should the boilers switch to fuel oil use and become subject to Subpart JJJJJ in the oil firing subcategory as defined in 40 CFR 63.11237 a significant permit revision will be required and compliance with Subpart JJJJJ will be required within 180 days of the effective date of the fuel switch.
2. In accordance with 40 CFR 63.6585(f)(3), NESHAP Subpart ZZZZ does not apply to institutional generators that are not contractually obligated for more than 15 hours a year for emergency demand response and operation where there is a deviation of voltage or frequency of 5 percent or greater below standard voltage, and are not operated for non-emergency purposes to supply power as part of a financial arrangement with another entity.

VII. PERMIT CHANGES and APPLICABILITY DETERMINATIONS

A. Permit and Permit Summary

The Specific Conditions have been organized into permit sections specific to the equipment and emission source categories at the facility. Many of the conditions in the previous permit may no longer apply and NSPS requirements apply to the boilers and generators.

B. General Applicability (Section 1):

This Section of the permit provides a reference for the PCC and federal rules that apply to the facility and operations, and to help organize the permit sections. Specific Conditions relating to the applicability of permitted facility sources are included in Section 6.

C. Facility-Wide Operations (Section 2):

This Section incorporates the facility wide provisions applicable to all sources at the facility and is used to streamline provisions applicable to the specific sources and operations in other Sections of the permit. The facility-wide provisions include the following: Operating Restrictions, General Control Standards, Materials Handling Standards, Odor Limiting Standards, Opacity Limits, Visibility Limiting Standard, and Asbestos Requirements for Demolition and Renovation Activities. This Section also includes the facility-wide provisions for recordkeeping, reporting requirements, facility changes, and testing requirements.

D. Fossil Fuel Fired Industrial and Commercial Equipment (Boilers and Heaters) (Section 3):

This Section incorporates applicable PCC requirements and operating restrictions for boilers, heaters, and fuel fired equipment to avoid certain requirements in PCC 17.16.165, 40 CFR Part 60, NSPS Subpart Dc and 40 CFR Part 63, and NESHAP Subpart JJJJJ for certain classes of boilers. The specific applicability provisions for the boilers, heaters, and fuel fired equipment are included in Section 6 and indicated in the equipment list in Attachment 2.

The listed boilers and heaters in the equipment list are limited to firing natural gas, fuel oil, or both. The specific definition for natural gas in this Section is taken from the NESHAP standard and is a broad definition that also includes LPG or Propane for use in temporary boilers or as an alternate fuel if required.

The fuel oils fired in the boilers are limited to distillate fuels which are limited by ASTM fuel standards to contain no more than 0.5% weight Sulfur (5000 ppm_{mass}) [ref. 40 CFR 63.11237, distillate fuel oil definition and ASTM D 396]. The permit limits the fuel sulfur content to avoid triggering certain federal and other applicable requirements for certain classes of boilers.

The permit restricts the Permittee to use fuel oil only during periods of gas curtailment, gas supply interruption, startups, or periodic testing on liquid fuel to avoid triggering tune up requirements for boilers that are considered oil fired boilers subject to 40 CFR Part 63, Subpart JJJJJ.

E. Non-NSPS / Non-NESHAP Generators (Section 4):

This Section contains requirements for generators that are not subject to NSPS or NESHAP requirements.

F. NSPS for Stationary Internal Combustion Engines ‘ICE’ (Section 5):

This Section incorporates specific federal emission limits and requirements for installation and operation of compression ignition engines subject to 40 CFR Part 60, NSPS Subpart IIII. The federal requirements limit operation of emergency engines to less than 100 hours per calendar year for maintenance and testing and emergency demand response and less than 50 of the 100 hours per year for non-emergency situations if they qualify per 40 CFR 60.4211(f)(3)(i). There are no limitations for the use of the emergency generators for true emergencies.

G. Specific Applicability Provisions (Section 6):

This Section of the permit includes specific conditions on the applicability of permitted facility sources to include provisions related to the source categories, affected facilities, equipment, emission sources, installations, activities and operations at the facility.

Applicable steam generating units (boilers) that comply with Section 3 of the permit shall be considered to be compliant with 40 CFR 60, Subpart Dc and PCC 17.16.165. The facility is required to submit a significant revision if the facility desires to fire fuels in the boilers other than those allowed in Section 3 or switching to fuel oil use and status as an oil fired boiler in accordance with 40 CFR 63, Subpart JJJJJ.

VII. Periodic Monitoring

This is a Class II/III permit and as such does not include the mandatory submittal of a semiannual summary report of required monitoring or an annual compliance certification to the Control Officer. The permit requires the facility to maintain the required periodic monitoring records on site and their submittal as requested by the Control Officer in order to demonstrate compliance.

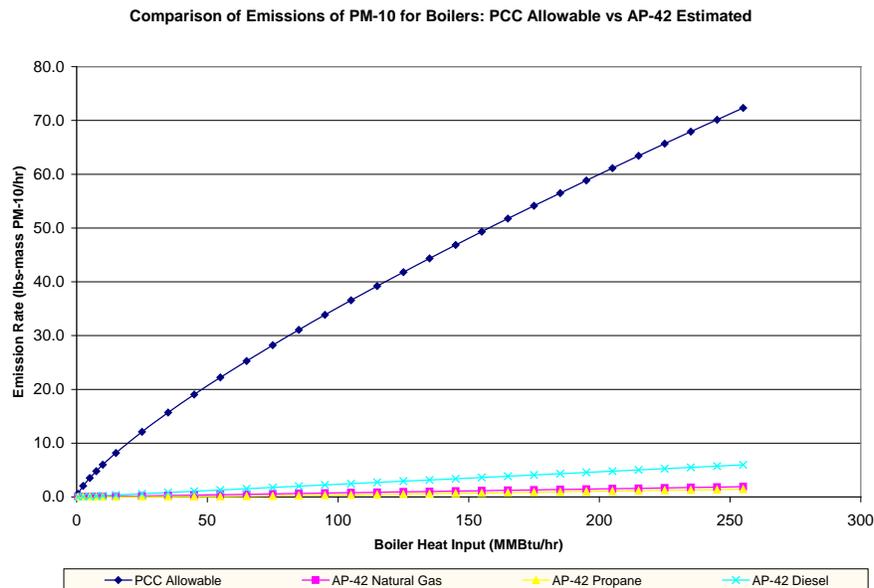
IX. Control Technology Determination

No control technologies needed to be determined; the source is not subject to RACT, BACT or LAER.

X. Exclusion of PCC Particulate Matter Discharge Rate Standards

The applicable PCC rule for limiting the maximum particulate matter discharge rates is not normally included in Class II and III area source permits as explained below.

- For particulate matter sources, the calculated maximum particulate matter discharge rate, as provided in Title 17, yields maximum rates that far exceed the emissions expected from most typical area sources. For example a 200 ton/hour process source, which is typical for an average construction aggregate screening operation, would be limited to a maximum particulate matter discharge rate of 40.4 lbs/hour or 177 tons/year. This limit far exceeds estimated emissions from typical sources using EPA AP-42 emission factors and the source is far more likely to exceed opacity and visibility limiting standards well before reaching this limit.
- With regard to fuel burning equipment, 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 limit is not normally included in permits because allowable emissions are consistently over an entire order of magnitude higher than EPA AP-42 estimated potential emissions. The chart below, illustrates the point.



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.

XI. Exclusion of PCC Sulfur Dioxide Emission Standards

Compliance with the fuel sulfur limitation requirements in the permit shall ensure compliance with the Sulfur Dioxide Standards of PCC 17.16.165.E and 17.16.340.F; which limit the emission of SO₂ to 1.0 pound per million BTU of 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. “High Sulfur Fuel” is defined as fuel oil containing 0.9% wt. or more Sulfur. In accordance with EPA AP-42 Appendix A, page A-5, the heating value of diesel fuel is estimated at 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. 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 limit.

An excess emissions report is required to be submitted to the control officer should the fuel oils fired in fuel burning equipment, to include non NSPS / non NESHAP rotating machinery, contain 0.9% wt. Sulfur or greater since the permit explicitly prohibits the use of high sulfur oil by the Permittee.

Jet fuel, natural gas, gasoline, and No. 1 and 2 distillate fuel oils and diesel delivered to Pima County consistently show sulfur levels below this limit as shown in fuel supplier certifications which verify the sulfur content of the fuel fired. The equipment specific sulfur content limitations in the permit and the prohibition to use high sulfur oil allow for the omission of PCC 17.16.165.E and PCC 17.16.340.F; these rules are incorporated by reference in Attachment 1 of the permit.