# Statement of Basis

# Minor Air Quality Operating Permit Renewal

# Veterans Affairs – Black Hills Health Care System Fort Meade, South Dakota

**South Dakota Department of Environment and Natural Resources**

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# 1.0 Operational Description

## 1.1 Background

The Veteran Affairs Black Hills Health Care System - Fort Meade Medical Center (Fort Meade Medical Center) consists of a medical center, National Guard camp and living quarters located in Fort Meade, South Dakota. On August 24, 1996, the Department of Environment and Natural Resources (DENR) issued the facility a minor air quality operating permit (#28.2202-49) with federally enforceable permit conditions to avoid a Title V air quality operating permit. During the 2004 permit renewal, the facility decided not to request federally enforceable limits, therefore DENR issued the facility Title V air quality operating permit #28.2202-49 that included a name change to Veterans Affairs Black Hills Health Care System, Fort Meade Medical Center. The primary SIC code for the facility is 8062 – General Medical and Surgical Hospitals.

In September 2009, Fort Meade Medical Center was issued a renewed minor air quality operating permit due to burning low-sulfur diesel fuel.

On December 9, 2010, Fort Meade Medical Center was issued construction permit #28.2202-49-01C to install an emergency generator. On April 8, 2011, Fort Meade Medical Center was issued a modified minor air quality operating permit to incorporate the emergency generator.

On February 4, 2015, DENR received Fort Meade Medical Center's application to renew its' minor air quality operating permit. The application was considered complete on November 4, 2015.

## 1.2 Existing Equipment

Table 1-1 provides a description of the currently permitted equipment at Fort Meade Medical Center from the minor air quality permit issues February 24, 2014.

***Table 1-1 – Description of Permitted Units, Operations, and Processes***

| Unit | Description | Maximum Operating Rate | Control Device |
|---|---|---|---|
| **#1** | Boiler #1 – 1957 Murray steam boiler, model 9443, fired with natural gas and distillate oil. | 500 horsepower heat output | Not Applicable |
| **#2** | Boiler #2 – 1957 Murray steam boiler, model 9444, fired with natural gas and distillate oil. | 500 horsepower heat output | Not Applicable |
| **#3** | Boiler #3 – 1968 Cleaver Brooks steam boiler, model D42, fired with natural gas and distillate oil. | 500 horsepower heat output | Not Applicable |
| **#5** | Emergency Generator #4 - building 113, 2006 Katolight, model 350DFCC3604E, diesel fired compression ignition generator. | 350 kilowatt | Not Applicable |
| **#7** | Emergency Generator #7-2008 Detroit Diesel-Main Stand-by- model CD2000SX6T2, diesel fired compression ignition generator. | 3,057 horsepower | Not Applicable |
| **#8** | Emergency Generator #8-2009 Cummins Power- | 49 horsepower | Not |

| Unit | Description | Maximum Operating Rate | Control Device |
|---|---|---|---|
| | fire department- model DSKCA-1933029, diesel fired compression ignition generator. | | Applicable |
| **#9** | Emergency Generator # 9 - 2013 Cummins, Model DSGAA-1321189, diesel fired compression ignition generator | 100 kilowatts | Not Applicable |
| **#10** | Emergency Generator #10 - 2013 Cummins, Model DSGAA-1321187, diesel fired compression ignition generator | 125 kilowatts | Not Applicable |

### 1.3 Other Equipment

Fort Meade Medical Center also operates a 1964 Binks paint booth that has not previously been required to be permitted.

## 2.0 New Source Performance Standards

DENR reviewed the new source performance standards and determined the following may be applicable to the Fort Meade Medical Center:

### 2.1 Standards Applicable to Generators – Subpart IIII

Subpart IIII is applicable to owners and operators of stationary compression ignition internal combustion engines that:

1. Commence construction after July 11, 2005 where the stationary compression ignition internal combustion engine are manufactured after April 1, 2006 and are not fire pump engines; or
2. Modify or reconstruct their stationary compression ignition internal combustion engine after July 11, 2005.

All emergency generators at the Fort Meade Medical Center are diesel fired compression ignition engines. Units #9 and #10 were constructed after the April 1, 2006 and are applicable to this subpart.

Units #5, #7, and #8 were constructed after the July 11, 2005 and are applicable to this subpart.

Units #5 and #7 are certified Tier II engines that meet the emission standards as shown in Table 2-1. Units #9 and #10 are 2013 certified Tier III engines and emission standards are shown in Table 2-2. Unit #8 is a certified Tier IV engine that meets the emission standards in Table 2-3. Emissions certification forms were submitted in the application.

***Table 2-1 – EPA Tier II Emission Standards***

| | Units #5 and #7 Tier II | |
|---|---|---|
| **NOx + NMHC** | 6.4 | Grams per kW-hr[1] |
| **TSP/$PM_{10}$/$PM_{2.5}$** | 0.2 | Grams per kW-hr[1] |
| **CO** | 3.5 | Grams per kW-hr[1] |

[1] – To convert from grams per kW-hour to pounds per million Btu, multiply by 0.646. The results are shown in Table 4-2.

***Table 2-2 – EPA Tier III Emission Standards***

| | Units #9 and #10 Tier III | |
|---|---|---|
| **NOx + NMHC** | 4.0 | Grams per kW-hr[1] |
| **TSP/$PM_{10}$/$PM_{2.5}$** | 0.3 | Grams per kW-hr[1] |
| **CO** | 5.0 | Grams per kW-hr[1] |

[1] – To convert from grams per kW-hour to pounds per million Btu, multiply by 0.646. The results are shown in Table 4-2.

***Table 2-3 – EPA Tier IV Emission Standards***

| | Unit #8 Tier IV | |
|---|---|---|
| **NOx + NMHC** | 7.5 | Grams per kW-hr[1] |
| **TSP/$PM_{10}$/$PM_{2.5}$** | 0.3 | Grams per kW-hr[1] |
| **CO** | 5.5 | Grams per kW-hr[1] |

[1] – To convert from grams per kW-hour to pounds per million Btu, multiply by 0.646. The results are shown in Table 4-2.

## 2.2 Standards Applicable to Generators – Subpart JJJJ

For the purposes of this subpart, the date construction commences is the date the engine is ordered by the owner or operator. Subpart JJJJ is applicable to owners and operators of stationary spark ignition internal combustion engines that commence construction after June 12, 2006, where the stationary spark ignition internal combustion engines are manufactured:

1. On or after July 1, 2007, for engines with a maximum engine power greater than or equal to 500 horsepower (except lean burn engines with a maximum engine power greater than or equal to 500 horsepower and less than 1,350 horsepower);
2. On or after January 1, 2008, for lean burn engines with a maximum engine power greater than or equal to 500 horsepower and less than 1,350 horsepower;
3. On or after July 1, 2008, for engines with a maximum engine power less than 500 horsepower;
4. On or after January 1, 2009, for emergency engines with a maximum engine power greater than 19 kilowatts (25 horsepower); or
5. Owners and operators of stationary spark ignition internal combustion engine that commence modification or reconstruction after June 12, 2006.

Units #5, #7, #8, #9, and #10 are not considered spark ignition engines; therefore, none of the generators at Fort Meade Medical Center are applicable to this subpart.

### 2.3 Standards Applicable to Boilers – Subpart D/Db/Dc

There are three New Source Performance Standards for fossil fuel-fired steam boilers. The three standards are applicable to the following steam boilers:

1. 40 CFR Part 60, Subpart D: applicable to a steam generator with a maximum operating rate of 250 million Btus per hour or more and commenced construction after August 17, 1971;
2. 40 CFR Part 60, Subpart Db: applicable to a steam generator with a maximum operating rate of 100 million Btus per hour or more and commenced construction after June 19, 1984; and
3. 40 CFR Part 60, Subpart Dc: applicable to a steam generator with a minimum design heat input capacity equal to or greater than 10 million Btus per hour but less than or equal to 100 million Btus per hour and commenced construction after June 9, 1989.

Units #1, #2, and #3 all have a maximum design heat input capacity of 500 horsepower (1.53 million Btus per hour), which is less than 10 million Btus per hour. The boilers, also, were constructed before 1989; therefore, the units are not subject to Subpart D, Db, or Dc.

### 2.4 Other Applicable New Source Performance Standards

DENR determined that no other New Source Performance Standard regulations are applicable to Fort Meade Medical Center.

## 3.0 New Source Review

ARSD 74:36:10:01 states New Source Review regulations apply to areas of the state which are designated as nonattainment pursuant to the Clean Air Act for any pollutant regulated under the Clean Air Act. This facility is located in Meade County, which is in attainment for all the pollutants regulated under the Clean Air Act. Therefore, this facility is not subject to new source review.

## 4.0 Prevention of Significant Deterioration

A prevention of significant deterioration (PSD) review applies to new major stationary sources and major modifications to existing major stationary sources in areas designated as attainment under Section 107 of the Clean Air Act for any regulated air pollutant. The following is a list of regulated air pollutants under the PSD program:

1. Total suspended particulate (PM);
2. Particulate with a diameter less than or equal to 10 microns (PM10);
3. Particulate with a diameter less than or equal to 2.5 microns (PM2.5);
4. Sulfur dioxide ($SO_2$);
5. Nitrogen oxides (NOx);

6. Carbon monoxide (CO);
7. Ozone – measured as volatile organic compounds (VOCs);
8. Lead;
9. Fluorides
10. Sulfuric acid mist;
11. Hydrogen sulfide;
12. Reduced sulfur compounds;
13. Total reduced sulfur; and
14. Greenhouse gases (carbon dioxide, methane, nitrous oxide, etc.).

If the source is considered one of the 28 named PSD source categories listed in Section 169 of the federal Clean Air Act, the major source threshold is 100 tons per year of any regulated air pollutant, except for greenhouse gases. The major source threshold for all other sources is 250 tons per year of any regulated air pollutant, except for greenhouse gases.

On June 23, 2014, the Supreme Court of the United States issued a ruling that the EPA could not require facilities to obtain a Prevention of Significant Deterioration program permit based solely on greenhouse gas emissions. The Supreme Court of the United States ruling states that in order for a Prevention of Significant Deterioration program evaluation for greenhouse gas to occur, a facility must trigger one of the major source thresholds for another regulated pollutant before a greenhouse gas emission can be considered under the Prevention of Significant Deterioration permitting program. The ruling applies to both new Prevention of Significant Deterioration program sources as well as major source modifications.

## 4.1 Potential Emissions

DENR uses stack test results to determine air emissions whenever stack test data is available from the source or a similar source. When stack test results are not available, DENR relies on manufacturing data, material balance, EPA's Compilation of Air Pollutant Emission Factors (AP-42, Fifth Edition, Volume 1) document, the applicant's application, or other methods to determine potential air emissions.

Potential emissions for each applicable pollutant are calculated from the maximum design capacity listed in the application and assuming the unit operates every hour of every day of the year, while using the fuel that will emit the greatest emissions. Potential emissions are not realistic of the actual emissions and are used only to identify which air quality permit and requirements Fort Meade Medical Center is required to meet.

### *4.1.1 Potential Emissions – Generator*

The facility operates two emergency generators. Generators produce emissions from the burning of fuel. Table 4-1 displays the emission factors as derived from the Compilation of Air Pollutant Emission Factors (AP-42, Fifth Edition, Volume 1, Chapter 3, Section 3.3, October 1996 (Engines < 600 horsepower), and Compilation of Air Pollutant Emission Factors (AP-42, Fifth Edition, Volume 1, Chapter 3, Section 3.4, October 1996 (Engines > 600 horsepower).

***Table 4-1 – Uncontrolled emission factors for generators***

| Distillate Oil (pounds per MMBtu) | $SO_2$ | VOC |
|---|---|---|
| (Engines < 600 horsepower) | 0.29 | 0.035 |
| (Engines > 600 horsepower) | 1.01*S[1] | 0.09 |

[1] – S indicates that the weight % of sulfur in the oil, 15 ppm.

Table 4-2 displays the emission factors for the certified Tier II, III, and IV engines.

***Table 4-2 – Uncontrolled emission factors for certified engines***

| Distillate Oil (pounds per MMBtu) | TSP/$PM_{10}$/$PM_{2.5}$ | NOx | CO |
|---|---|---|---|
| Tier II (Units #5 and #7) | 0.13 | 4.13 | 2.26 |
| Tier III (Units #9 and #10) | 0.19 | 2.58 | 3.23 |
| Tier IV (Unit #8) | 0.19 | 4.85 | 3.55 |

Equations 4-1 and 4-2 were used to determine the heat input rate of the generators based on the heat output. The conversion factor was derived from AP-42, Appendix A, page A-29, January 1995, and already accounts for the efficiency of the unit.

***Equation 4-1 – Horsepower Unit Conversion***

$$Heat\ Input\left(\frac{MMBtus}{hours}\right) = \frac{Output(horsepower) \times 2{,}454\left(\frac{Btus}{horsepower}\right)}{1{,}000{,}000\left(\frac{Btus}{MMBtus}\right) \times Efficiency}$$

***Equation 4-2 – Kilowatt Unit Conversion***

$$Heat\ Input\left(\frac{MMBtus}{hours}\right) = \frac{Output(Kilowatts) \times 3{,}413\left(\frac{Btus}{Kilowatt}\right)}{1{,}000{,}000\left(\frac{Btus}{MMBtus}\right) \times Efficiency}$$

Using the horsepower or kilowatt ratings in Table 1-1 and Equations 4-1 and 4-2, the heat input rates for the generators were calculated. The results can be seen in Table 4-3.

***Table 4-3 – Maximum Designed Heat Input Capacities-Generators***

| Unit | Operating Rate | Operating Efficiency | Heat Input (million Btus per hour) |
|---|---|---|---|
| **#5** | 350 kilowatts | 0.35 | 3.4 |
| **#7** | 3,057 horsepower | 0.35 | 21.4 |
| **#8** | 49 horsepower | 0.35 | 0.3 |
| **#9** | 100 kilowatts | 0.35 | 1.0 |
| **#10** | 125 kilowatts | 0.35 | 1.2 |

Equation 4-3 calculates the generators' potential emissions of each pollutant based on the capacities found in Table 4-3, the emission factors in Table 4-1 and Table 4-2, and 500 operating hours per year because the engines are used for emergency use only.

***Equation 4-3 – Generator Potential Emissions for Distillate Oil***

$$Potential\left(\frac{tons}{year}\right) = \frac{Input\ Capacity\left(\frac{MMBtu}{hour}\right) \times Emission\ Factor\left(\frac{pounds}{MMBtu}\right) \times 500\left(\frac{hours}{year}\right)}{2{,}000\left(\frac{pounds}{ton}\right)}$$

Table 4-4 summarizes the potential emissions from the generators.

***Table 4-4 – Potential uncontrolled emissions for generators (tons per year)***

| Unit | TSP | $PM_{10}$ | $PM_{2.5}$ | $SO_2$ | NOx | CO | VOCs |
|---|---|---|---|---|---|---|---|
| **#5** | 0.11 | 0.11 | 0.11 | 0.25 | 3.51 | 1.92 | 0.03 |
| **#7** | 0.70 | 0.70 | 0.70 | 0.01 | 22.10 | 12.10 | 0.48 |
| **#8** | 0.01 | 0.01 | 0.01 | 0.02 | 0.36 | 0.27 | 0.00 |
| **#9** | 0.05 | 0.05 | 0.05 | 0.07 | 0.65 | 0.81 | 0.01 |
| **#10** | 0.06 | 0.06 | 0.06 | 0.09 | 0.77 | 1.0 | 0.01 |
| **Total** | **1** | **1** | **1** | **0** | **27** | **16** | **1** |

### *4.1.2 Potential Emissions – Boiler*

The air pollutant emission factors for boilers are derived from EPA's AP-42 – Fifth Edition. Boilers are classified according to their design capacity. AP-42 states that small boilers are defined as those that have a heat input capacity of less than 100 million Btus per hour. Based on the heat input capacities listed in the application, the boilers at Fort Meade Medical Center are classified as small boilers. Emission factors for natural gas were derived from Tables 1.4-1, 1.4-2, and 1.4-3. Emission factors for distillate oil were derived from Tables 1.3-1, 1.3-3, and 1.3-4. Emission factors for the boilers are summarized in Table 4-5.

***Table 4-5 – Uncontrolled Emission Factors for Boilers***

| Pollutant | $TSP/PM_{10}/PM_{2.5}$ | $SO_2$ | $NO_x$ | CO | VOCs |
|---|---|---|---|---|---|
| **Natural Gas (pounds per $10^6$scf)[1]** | 7.6 | 0.6 | 100 | 84 | 5.5 |
| **Natural Gas (pounds per million Btu)** | 0.007 | 0.0006 | 0.098 | 0.082 | 0.005 |
| **Distillate Oil (pounds per $10^3$ gallons)[3]** | 2 | $142*S^2$ | 20 | 5 | 0.34 |
| **Distillate Oil (pounds per million Btu)** | 0.014 | 0.0015 | 0.14 | 0.04 | 0.002 |

[1] – To convert from pounds per $10^6$ scf, divide by 1,020.

[2] – S indicates that the weight % of sulfur in the oil should be multiplied by the value given. For example, if the fuel is 1% sulfur, then S = 1. The sulfur content is 0.0015 weight %.

[3] – To convert from pounds per $10^3$ gallons, divide by 140.

The application listed the three boilers as having heat output ratings of 500 horsepower. Equation 4-1 converts horsepower to million Btus per hour with an operating efficiency of 80 percent. The results are shown in Table 4-6.

***Table 4-6 – Maximum Designed Heat Input Capacities – Generators***

| Unit | Operating Rate (Horsepower) | Operating Efficiency | Heat Input (million Btus per hour) |
|---|---|---|---|
| **#1** | 500 | 0.8 | 1.53 |
| **#2** | 500 | 0.8 | 1.53 |
| **#3** | 500 | 0.8 | 1.53 |

Equation 4-4 calculates the generators' potential emissions of each pollutant based on the capacities (heat input), the listed emission factor, and 8,760 operating hours per year.

***Equation 4-4 – Boiler Potential Emissions***

$$Potential\left(\frac{tons}{year}\right) = \frac{input\ capacity\left(\frac{MMBtu}{hour}\right) \times emission\ factor\left(\frac{pounds}{MMBtu}\right) \times 8{,}760\left(\frac{hours}{year}\right)}{2{,}000\left(\frac{pounds}{ton}\right)}$$

Table 4-7 summarizes the potential emissions from each of the boilers while fired by natural gas.

***Table 4-7 – Boiler emission for natural gas (tons per year)***

| Unit | TSP | $PM_{10}$ | $PM_{2.5}$ | $SO_2$ | NOx | CO | VOCs |
|---|---|---|---|---|---|---|---|
| **#1** | 0.05 | 0.05 | 0.05 | 0.00 | 0.66 | 0.55 | 0.03 |
| **#2** | 0.05 | 0.05 | 0.05 | 0.00 | 0.66 | 0.55 | 0.03 |
| **#3** | 0.05 | 0.05 | 0.05 | 0.00 | 0.66 | 0.55 | 0.03 |
| **Total** | **0** | **0** | **0** | **0** | **2** | **2** | **0** |

Table 4-8 summarizes the potential emissions from the boilers when fueled with distillate oil.

***Table 4-8 – Boiler emissions fueled with distillate oil (tons per year)***

| Description | TSP | $PM_{10}$ | $PM_{2.5}$ | $SO_2$ | NOx | CO | VOCs |
|---|---|---|---|---|---|---|---|
| **#1** | 0.09 | 0.09 | 0.09 | 0.01 | 0.94 | 0.27 | 0.01 |
| **#2** | 0.09 | 0.09 | 0.09 | 0.01 | 0.94 | 0.27 | 0.01 |
| **#3** | 0.09 | 0.09 | 0.09 | 0.01 | 0.94 | 0.27 | 0.01 |
| **Total** | **0** | **0** | **0** | **0** | **3** | **1** | **0** |

### *4.1.3 Potential Emissions – Paint Booth*

Emissions from the paint booth were calculated in Fort Meade Medical Center's previous statement of basis in 2009, using by EPA's *AP-42 Air Pollutant Emission Factors* and the provided material and safety data sheets. There has been no change in Fort Meade Medical Center's paint booth or to emission factors used to calculate its emissions; therefore the department will use the same emissions that were previously calculated.

### *4.1.4 Potential Emission – Summary*

The facility potential emissions from the source categories discussed above in addition to the permitted existing equipment are summarized in Table 4-9.

***Table 4-9 – Potential Emissions (tons per year)***

| Source | TSP | $PM_{10}$ | $PM_{2.5}$ | $SO_2$ | NOx | CO | VOC |
|---|---|---|---|---|---|---|---|
| **Generators** | 1 | 1 | 1 | 1 | 27 | 16 | 1 |
| **Boilers**[1] | 0 | 0 | 0 | 0 | 3 | 2 | 0 |
| **Paint Booth**[2] | 0 | 0 | 0 | 0 | 0 | 0 | 2 |
| **Total** | **1** | **1** | **1** | **1** | **30** | **18** | **3** |

[1] – Potential Emissions from the boilers are worst case scenario.
[2] – From 2009 Statement of Basis.

### 4.2 PSD Summary

Fort Meade Medical Center does not meet the 250 tons per year threshold and is not one of the 28 named PSD source categories. Therefore, Fort Meade Medical Center is considered a minor source for criteria air pollutants under the PSD program and is not subject to PSD requirements.

## 5.0 National Emission Standards for Hazardous Air Pollutants

DENR reviewed the national emission standards for hazardous standards and determined Fort Meade Medical Center is not applicable to any standards under 40 CFR Part 61.

## 6.0 Maximum Achievable Control Technology Standards

### 6.1 Potential Hazardous Air Pollutant Emissions

The federal Maximum Achievable Control Technology Standards are applicable to both major and area sources of hazardous air pollutants. A major source of hazardous air pollutants is defined as having the potential to emit 10 tons or more per year of a single hazardous air pollutant or 25 tons per year or more of a combination of hazardous air pollutants. An area source is a source that is not a major source of hazardous air pollutants.

DENR uses stack test results to determine air emissions whenever stack test data is available from the source or a similar source. When stack test results are not available, DENR relies on manufacturing data, material balance, EPA's Compilation of Air Pollutant Emission Factors (AP-42, Fifth Edition, Volume 1) document, the applicant's application, or other methods to determine potential air emissions.

#### *6.1.1 Potential Hazardous Air Pollutant Emissions – Generators*

The potential for generators to emit hazardous air pollutants can be calculated using the same assumptions outlined in 4.1.1. The emission factors as derived from the Compilation of Air Pollutant Emission Factors (AP-42, Fifth Edition, Volume 1, Chapter 3, Section 3.3, October 1996 (Engines < 600 horsepower), and Compilation of Air Pollutant Emission Factors (AP-42, Fifth Edition, Volume 1, Chapter 3, Section 3.4, October 1996 (Engines > 600 horsepower), and

are listed in Table 6-1. The total potential emissions can be calculated using Equation 4-2. The results for the generators are listed in Table 6-2.

***Table 6-1 – Hazardous Air Pollutant Emission Factors (pounds per million Btu)***

| | **Emission Factor** |
|---|---|
| **Generator (<600 Horsepower)** | 0.00379 |
| **Generator (>600 Horsepower)** | 0.00156 |

***Table 6-2 – Potential Hazardous Air Pollutant Emissions for Generators (tons per year)***

| **Unit** | **HAPs** |
|---|---|
| **#5** | 0.003 |
| **#7** | 0.008 |
| **#8** | 0.0003 |
| **#9** | 0.0009 |
| **#10** | 0.001 |
| **Total** | **0** |

### *6.1.2 Potential Hazardous Air Pollutant Emissions – Boilers*

The potential for boilers to emit hazardous air pollutants can be calculated using the same assumptions outlined in 4.1.2. The emission factor for hazardous air pollutants for natural gas fired boilers was derived from AP 42, Tables 1.4-1, 1.4-2, and 1.4-3. The emission factor for hazardous air pollutants for distillate oil fired boilers was derived from AP 42, Table 1.3-9. The potential emissions factors are shown in Table 6-3.

***Table 6-3 – Hazardous Air Pollutant Emission Factors (pounds per million Btu)***

| | **Emission Factor** |
|---|---|
| **Boiler – Natural Gas (pounds per $10^6$scf)[1]** | 1.88 |
| **Boiler – Natural Gas (pounds per million Btu)** | 0.0018 |
| **Boiler – Distillate Oil (pounds per $10^3$ gallons)[2]** | 0.041 |
| **Boiler – Distillate Oil (pounds per million Btu)** | 0.00029 |

[1] – To convert from pounds per $10^6$ scf, divide by 1,020.
[2] – To convert from pounds per $10^3$ gallons, divide by 140.

Equation 4-5 was used to calculate potential emissions from the boilers for hazardous air pollutants. Table 6-4 shows the potential emissions for the boilers fired with natural gas.

***Table 6-4 – Potential Hazardous Air Pollutant Emissions for Natural Gas (tons per year)***

| **Unit** | **HAPs** |
|---|---|
| **#1** | 0.012 |
| **#2** | 0.012 |
| **#3** | 0.012 |
| **Total** | **0** |

Table 6-5 shows the potential emissions for the boilers fired with distillate oil.

***Table 6-5 – Potential Hazardous Air Pollutant Emissions for Distillate Oil (tons per year)***

| Unit | HAPs |
|---|---|
| **#1** | 0.002 |
| **#2** | 0.002 |
| **#3** | 0.002 |
| **Total** | **0** |

The worse scenario for the boilers, for hazardous air pollutants, would be emissions from natural gas.

### *6.1.3 Hazardous Air Pollutant Emissions Summary*

Table 6-6 shows the summary of the potential hazardous air pollutant emissions.

***Table 6-6 – Potential Hazardous Air Pollutant Emissions Summary (tons per year)***

| Unit | HAPs |
|---|---|
| **Generators** | 0 |
| **Boilers** | 0 |
| **Total** | **0** |

Based on Table 6-6 the potential to emit is less than 10 tons of a single hazardous air pollutant, and has the potential to emit less than 25 tons of any combination of a hazardous air pollutant. Therefore, Fort Meade Medical Center is considered an area source for hazardous air pollutants.

## 6.2 Maximum Achievable Control Technology Standards

DENR reviewed the Maximum Achievable Control Technology standards under 40 CFR Part 63 and determined the following need to be reviewed further to determine if they are applicable.

### *6.2.1 40 CFR Part 63 Subpart ZZZZ*

In accordance with 40 CFR Part 63 Subpart ZZZZ—National Emissions Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines an affected source is any existing, new, or reconstructed stationary reciprocating internal combustion engines located at a major or area source of hazardous air pollutant emissions, excluding stationary reciprocating internal combustion engines being tested at a stationary reciprocating internal combustion engines test cell/stand (40 CFR § 63.6590).

A stationary reciprocating internal combustion engine located at an area source of hazardous air pollutants is existing if you commenced construction or reconstruction of the stationary reciprocating internal combustion engine before June 12, 2006. Units #5, #7, #8, #9, and #10 were constructed after June 12, 2006 and are located at an area source. Therefore, the emergency generators in operation at Fort Meade Medical Center are considered new reciprocating internal combustion engines and are applicable to this subpart.

### *6.2.2 Standards for Boilers – Subpart JJJJJJ*

Subpart JJJJJJ is applicable to any new or existing industrial, commercial and institutional boiler located at an area source of hazardous air pollutants. A new boiler is defined as a boiler where construction was commenced after June 4, 2010 and the boiler meets the applicabililty criteria at the time construction was commenced. An existing boiler is defined as a boiler where construction or reconstruction occurred prior to June 4, 2010. The subpart excludes boilers that are gas-fired according to the definition.

Fort Meade Medical Center operates three boilers, Units #1, #2, and #3, which were constructed before June 4, 2010 and are located at an area source of hazardous air pollutants. Therefore, Units #1, #2, and #3 are applicable to Subpart JJJJJJ.

### *6.2.3 Industrial, Commercial, and Institutional Boilers and Process Heaters*

40 CFR Part 63, Subpart DDDDD establishes national emission and operating limits for hazardous air pollutants emitted from industrial, commercial, and institutional boilers and process heaters located at a major source of hazardous air pollutant emissions. Because of emission and operational limits, Fort Meade Medical Center is considered an area source of hazardous air pollutants and not subject to this subpart.

### *6.2.4 Surface Coating of Miscellaneous Metal Parts and Products*

The National Emission Standards for Surface Coating of Miscellaneous Metal Parts and Products is applicable to new, reconstructed, or existing affected sources that use 946 liters (250 gallons) per year, or more, of coatings that contain HAPs in the surface coating of miscellaneous metal parts and products and that is a major source, is located at a major source, or is part of a major source of HAP emissions.

Fort Meade Medical Center's operation is not a major source of hazardous air pollutant emissions. Therefore, the operations at the facility are not subject to this subpart.

### *6.2.5 Paint Stripping and Miscellaneous Surface Coating Operations*

The National Emission Standards for Paint Stripping and Miscellaneous Surface Coating Operations is applicable to establishments that are considered area source of hazardous air pollutants, which have paint stripping operations that involve the use of chemical strippers that contain methylene chloride (MeCl), Chemical Abstract Service number 75092, in paint removal processes; autobody refinishing operations that encompass motor vehicle and mobile equipment spray-applied surface coating operations; and spray application of coatings containing compounds of chromium (Cr), lead (Pb), manganese (Mn), nickel (Ni), or cadmium (Cd), collectively referred to as the target hazardous air pollutants to any part or product made of metal or plastic, or combinations of metal and plastic that are not motor vehicles or mobile equipment.

Motor vehicle and mobile equipment surface coating means the spray application of coatings to assembled motor vehicles or mobile equipment. Mobile equipment means any device that may

be drawn and/or driven on a roadway including, but not limited to, heavy-duty trucks, truck trailers, fleet delivery trucks, buses, mobile cranes, bulldozers, street cleaners, agriculture equipment, motor homes, and other recreational vehicles.

Fort Meade Medical Center is considered an area source for hazardous air pollutants. Upon review of the Material Safety Data Sheets (MSDS) submitted as part of the application, no paint used in the spray applications contain any of above listed target hazardous air pollutants and does not spray coat on assembled mobile equipment. Therefore, Fort Meade Medical Center is not applicable to this subpart.

#### *6.2.6 Other Maximum Achievable Control Technology Standards*

DENR determined no other Maximum Achievable Control Technology Standards are applicable to the operations at Fort Meade Medical Center.

## 7.0 State Requirements

### 7.1 Permit Type

Any source operating in South Dakota that meets the requirements of the Administrative Rules of South Dakota (ARSD) 74:36:05:03 is required to obtain a Title V air quality operating permit. Fort Meade Medical Center's particulate matter, sulfur dioxide ($SO_2$), nitrogen oxides (NOx), carbon monoxide (CO) and volatile organic compound (VOC) emissions are less than 100 tons per year, carbon dioxide equivalent (CO2) emissions are less than 100,000 tons per year and hazardous air pollutant emissions are less than 10 tons per year for a single hazardous air pollutant and 25 tons per year of a combination of hazardous air pollutant. However, Fort Meade Medical Center is applicable to 40 CFR Part 60, Subpart IIII and 40 CFR Part 63, Subpart ZZZZ.

The applicable New Source Performance Standards and Maximum Achievable Control Technology Standards were promulgated under Section 111 and Section 112 of the Clean Air Act. However, both the subparts exempt affected area sources from Part 70 operating permits provided they are not required to obtain a permit Part 70 operating permit under 40 CFR 70.3(a) for a reason other than their status as an area source under those subparts.

Based on the emission estimates, Fort Meade Medical Center is still considered a minor source.

### 7.2 Emission Limits

Total suspended particulate matter and sulfur dioxide emission limits are applicable to fuel burning units. Fort Meade Medical Center's operation involves fuel burning units. The total suspended particulate matter and sulfur dioxide emission limits for fuel burning units are derived from ARSD 74:36:06:02. In accordance with ARSD 74:36:06:01, a unit that is subject to a New Source Performance Standards that contains limits on particulate matter and/or sulfur dioxide is not applicable to the state's particulate matter and/or sulfur dioxide emission limits.

### *7.2.1 State Particulate Emission Limits*

In accordance with 74:36:12, fuel burning units are subject to a visible emission limit of 20 percent opacity.

Particulate matter emission limits for fuel burning units are derived from ARSD 74:36:06:02. ARSD 74:36:06:02(1)(a), notes a fuel burning unit with heat input less than 10 million Btus per hour may not exceed 0.6 pounds of particulate matter per million Btus of heat input. In accordance with ARSD 74:36:06:02(1)(b), a fuel-burning unit may not exceed the particulate emissions rate determined by Equation 7-1.

***Equation 7-1 – Particulate Matter Emissions***

$E = 0.811 \times H^{-0.131}$

Where:

- E = the allowable particulate emissions rate in pounds per million Btus of heat input; and
- H = heat input in millions of Btus per hour;

Table 7-1 provides a maximum heat input value for each unit, the corresponding particulate emission limit, and a comparison of the state emission limit to the potential emissions to determine if the units are in compliance with the state emission limits.

***Table 7-1 – State Total Suspended Particulate Matter Emission Limit for Fuel Burning Units***

| Unit | Potential Emission Rate | State Emission Limit |
|---|---|---|
| **#1** | 0.014 pounds per million Btu | 0.6 pounds per million Btu |
| **#2** | 0.014 pounds per million Btu | 0.6 pounds per million Btu |
| **#3** | 0.014 pounds per million Btu | 0.6 pounds per million Btu |

Based on the emission comparison in Table 7-1, the units can operate in compliance with the state particulate matter emission limit.

### *7.2.2 State Sulfur Dioxide Emission Limits*

ARSD 74:36:06:02(2), the sulfur dioxide emission limit for a fuel burning unit is 3.0 pounds per million Btus heat input based on a three-hour rolling average.

***Table 7-2 – State Sulfur Dioxide Emission Limit for Fuel Burning Units***

| Unit | Potential Emission Rate | State Emission Limit |
|---|---|---|
| **#1** | 0.0015 pounds per million Btu | 3.0 pounds per million Btu |
| **#2** | 0.0015 pounds per million Btu | 3.0 pounds per million Btu |
| **#3** | 0.0015 pounds per million Btu | 3.0 pounds per million Btu |

Based on the emission comparison in Table 7-2, the units can operate in compliance with the state sulfur dioxide emission limit.

### 7.3 Performance Tests

Based on the type of permitted operations and compliance history of this facility, Fort Meade Medical Center will not be required to conduct stack performance tests at this time. The permit will contain language that allows DENR to require a stack performance test or fuel analysis during the term of the permit if an investigation of the facility warrants it.

### 7.4 Compliance Assurance Monitoring

Compliance assurance monitoring is applicable to any unit at major sources applying for a Title V air quality permit. The Fort Meade Medical Center is a minor source and is not required to obtain a Title V air quality permit. Compliance assurance monitoring is only required of major sources obtaining a Title V air quality permit. Therefore, compliance assurance monitoring is not required.

### 7.5 Periodic Monitoring

Periodic monitoring is required for each emission unit that is subject to an applicable requirement at a source subject to Title V of the federal Clean Air Act. Fort Meade Medical Center is a minor source and therefore, not required to do periodic monitoring. However, any monitoring required by the applicable New Source Performance Standards or Maximum Achievable Control Technology standards will be included in the permit.

## 8.0 Recommendation

Based on the above findings, Fort Meade Medical Center is required to operate within the requirements stipulated in the following regulations:

1. ARSD 74:36:04 – Operating Permits for Minor Sources;
2. ARSD 74:36:06 – Regulated Air Pollutant Emissions;
3. ARSD 74:36:07 – New Source Performance Standards;
4. ARSD 74:36:08 – National Emission Standards for Hazardous Air Pollutants; and
5. ARSD 74:36:12 – Control of Visible Emissions.

Based on the information submitted in the air quality permit application, the department recommends approval to renew a Minor air quality operating permit for Fort Meade Medical Center in Fort Meade, South Dakota. Questions regarding this permit review should be directed to Samantha Olmstead, Engineer I.