



Statement of Basis

Air Quality Construction Permit

**Smithfield Packaged Meats Corporation
Sioux Falls, South Dakota**

Table of Contents

	Page
1.0 Background.....	1
1.1 Proposed Equipment	1
1.2 Other Emission Activities.....	4
2.0 New Source Performance Standards.....	5
2.1 Standards Applicable to Generators – Subpart III.....	5
2.2 Standards Applicable to Generators – Subpart JJJJ.....	6
2.3 Standards Applicable to Boilers – Subparts D, Da, Db, and Dc.....	7
2.4 Standards Applicable to Storage Tanks – K, Ka, Kb, and Kc	7
2.5 Other New Source Performance Standards	8
3.0 New Source Review	8
4.0 Prevention of Significant Deterioration	8
4.1 Potential Emissions	9
4.2 Proposed Limits	9
4.2.1 <i>Potential Emissions – Natural Gas Combustion</i>	9
4.2.2 <i>Potential Emissions – Generators</i>	10
4.2.3 <i>Potential Emissions – Smoke Generation</i>	11
4.2.4 <i>Potential Emissions – Blood Dryer</i>	12
4.2.5 <i>Potential Emissions – Tanks</i>	13
4.2.6 <i>Potential Emissions – Liquid Smoke Drenching</i>	13
4.2.7 <i>Potential Emissions – Other Emission Activities</i>	13
4.2.8 <i>Summary of Potential Emission</i>	14
4.3 Prevention of Significant Deterioration Summary	14
5.0 National Emission Standards for Hazardous Air Pollutants.....	14
6.0 Maximum Achievable Control Technology Standards	15
6.1 Potential Hazardous Air Pollutant Emissions.....	15
6.1.1 <i>Potential Hazardous Air Pollutant Emissions – Natural Gas Combustion</i> ..	15
6.1.2 <i>Potential Hazardous Air Pollutant Emissions – Generators</i>	15
6.1.3 <i>Potential Hazardous Air Pollutant Emissions – Smoke Generation</i>	16
6.1.4 <i>Potential Hazardous Air Pollutant Emissions – Blood Dryer</i>	16
6.1.5 <i>Potential Hazardous Air Pollutant Emissions – Tanks</i>	17
6.1.6 <i>Potential Hazardous Air Pollutant Emissions – Liquid Smoke Drenching</i> ..	17
6.1.7 <i>Potential Hazardous Air Pollutant Emissions – Other Emission Activities</i> ..	17
6.1.8 <i>Summary of Hazardous Air Pollutant Emissions</i>	17
6.2 Maximum Achievable Control Technology Standards	18
6.2.1 <i>Standards Applicable to Generators – Subpart ZZZZ</i>	18
6.2.2 <i>Standards Applicable to Boilers – Subpart DDDDD</i>	18
6.2.3 <i>Standards Applicable to Boilers – Subpart JJJJJJ</i>	18
6.2.4 <i>Other Maximum Achievable Control Technology Standards</i>	19
7.0 State Requirements	19
7.1 Permit Type	19
7.2 Insignificant Activities	19
7.3 State Emissions Limits.....	21
7.2.1 <i>Particulate Emission Limits</i>	21
7.3.2 <i>Sulfur Dioxide Emission Limits</i>	23
7.3.3 <i>Visible Emissions</i>	24

Table of Contents

	Page
7.4 Performance Tests	25
7.5 Title V Air Quality Operating Permit.....	25
8.0 Recommendation	25

1.0 Background

On May 5, 2026, the South Dakota Department of Agriculture and Natural Resources (DANR) received an air quality construction permit for Smithfield Packaged Meats Corporation (Smithfield) in Sioux Falls, South Dakota. Smithfield is proposing to construct a new pork processing facility. Operations will consist of fresh pork processing and consumer packaged goods including ham, bacon, sausage, crumble toppings, meatballs, patties, and hot dogs. The primary standard industrial classification (SIC) code for this facility is 2011, Manufacturing – Meat Packing Plants.

The application was deemed complete May 27, 2026.

1.1 Proposed Equipment

Table 1-1 provides a list of the proposed equipment as listed in the air quality construction permit application.

Table 1-1 – Description of Proposed Units, Operations, and Processes

Unit	Description	Maximum Operating Rate	Control Device
#1	2026 or newer Boiler #1, fueled with natural gas	60.243 million Btus per hour	Low NOx burner
#2	2026 or newer Boiler #2, fueled with natural gas	60.243 million Btus per hour	Low NOx burner
#3	2026 or newer Boiler #3, fueled with natural gas	60.243 million Btus per hour	Low NOx burner
#4	2026 or newer Boiler #4, fueled with natural gas	60.243 million Btus per hour	Low NOx burner
#5	2026 or newer Singer #1, fueled with natural gas	26 million Btus per hour	Not applicable
#6	2026 or newer Singer #2, fueled with natural gas	26 million Btus per hour	Not applicable
#7	2026 or newer Singer #3, fueled with natural gas	26 million Btus per hour	Not applicable
#8	2026 or new Singer #4, fueled with natural gas	26 million Btus per hour	Not applicable
#9	2026 or newer Smokehouse #1 Electric Smoke Generator, fueled with wood chips	Not applicable	Wet scrubber
	2026 or newer Smokehouse #1 Batch Oven, fueled with natural gas	3.85 million Btus per hour	
#10	2026 or newer Smokehouse #2 Electric Smoke Generator, fueled with wood chips	Not applicable	Wet scrubber
	2026 or newer Smokehouse #2 Batch Oven, fueled with natural gas	3.85 million Btus per hour	
#11	2026 or newer Smokehouse #3 Electric Smoke Generator, fueled with wood chips	Not applicable	Wet scrubber

Unit	Description	Maximum Operating Rate	Control Device
	2026 or newer Smokehouse #3 Batch Oven, fueled with natural gas	3.85 million Btus per hour	
#12	2026 or newer Smokehouse #4 Electric Smoke Generator, fueled with wood chips	Not applicable	Wet scrubber
	2026 or newer Smokehouse #4 Batch Oven, fueled with natural gas	3.85 million Btus per hour	
#13	2026 or newer Smokehouse #5 Electric Smoke Generator, fueled with wood chips	Not applicable	Wet scrubber
	2026 or newer Smokehouse #5 Batch Oven, fueled with natural gas	3.85 million Btus per hour	
#14	2026 or newer Smokehouse #6 Electric Smoke Generator, fueled with wood chips	Not applicable	Wet scrubber
	2026 or newer Smokehouse #6 Batch Oven, fueled with natural gas	3.85 million Btus per hour	
#15	2026 or newer Smokehouse #7 Electric Smoke Generator, fueled with wood chips	Not applicable	Wet scrubber
	2026 or newer Smokehouse #7 Batch Oven, fueled with natural gas	3.85 million Btus per hour	
#16	2026 or newer Smokehouse #8 Electric Smoke Generator, fueled with wood chips	Not applicable	Wet scrubber
	2026 or newer Smokehouse #8 Batch Oven, fueled with natural gas	3.85 million Btus per hour	
#17	2026 or newer Smokehouse #9 Electric Smoke Generator, fueled with wood chips	Not applicable	Wet scrubber
	2026 or newer Smokehouse #9 Batch Oven, fueled with natural gas	3.85 million Btus per hour	
#18	2026 or newer Smokehouse #10 Electric Smoke Generator, fueled with wood chips	Not applicable	Wet scrubber
	2026 or newer Smokehouse #10 Batch Oven, fueled with natural gas	3.85 million Btus per hour	
#19	2026 or newer Smokehouse #11 Electric Smoke Generator, fueled with wood chips	Not applicable	Wet scrubber
	2026 or newer Smokehouse #11 Batch Oven, fueled with natural gas	3.85 million Btus per hour	
#20	2026 or newer Smokehouse #12 Electric Smoke Generator, fueled with wood chips	Not applicable	Wet scrubber
	2026 or newer Smokehouse #12 Batch Oven, fueled with natural gas	3.85 million Btus per hour	
#21	2026 or newer Smokehouse #13 Electric Smoke Generator, fueled with wood chips	Not applicable	Wet scrubber
	2026 or newer Smokehouse #13 Batch Oven, fueled with natural gas	3.85 million Btus per hour	
#22	2026 or newer Oven #1, fueled with natural gas	1 burner at 1.71 million Btus per	Wet scrubber

Unit	Description	Maximum Operating Rate	Control Device
		hour 3 burners at 0.913 million Btus per hour, each	
#23	2026 or newer Oven #2, fueled with natural gas	1 burner at 1.71 million Btus per hour 3 burners at 0.913 million Btus per hour, each	Wet scrubber
#24	2026 or newer Oven #3, fueled with natural gas	1 burner at 1.71 million Btus per hour 3 burners at 0.913 million Btus per hour, each	Wet scrubber
#25	2026 or newer Oven #4, fueled with natural gas	4 burners at 2.475 million Btus per hour, each	Wet scrubber
#26	2026 or newer Liquid Smoke Drenching	7 gallons per hour	Not applicable
#27	2026 or newer Rendering Cooker #1, steam heated	Not applicable	Room air scrubber #1 or Room air scrubber #2, and regenerative thermal oxidizer ¹
	2026 or newer Rendering Cooker #2, steam heated	Not applicable	
	Shell and tube condenser	Not applicable	
	2026 or newer Hair Hydrolyzer	Not applicable	
	2026 or newer Blood Dryer, fueled with natural gas	3.76 million Btus per hour	
	Thermal oxidizer, fueled with natural gas, and/or exhaust gases	2.2 million Btus per hour	
#28	2026 or newer Emergency Generator #1, fueled with distillate oil	500 kilowatts	Not applicable
#29	2026 or newer Emergency Generator #2, fueled with distillate oil	500 kilowatts	Not applicable
#30	2026 or newer Air Makeup Unit #1, fueled with natural gas	10 million Btus per hour	Not applicable
#31	2026 or newer Air Makeup Unit #2, fueled with natural gas	10 million Btus per hour	Not applicable
#32	2026 or newer Air Makeup Unit #3, fueled with natural gas	10 million Btus per hour	Not applicable
#33	2026 or newer Air Makeup Unit #4, fueled with natural gas	10 million Btus per hour	Not applicable
#34	2026 or newer Air Makeup Unit #5, fueled with natural gas	10 million Btus per hour	Not applicable

Unit	Description	Maximum Operating Rate	Control Device
#35	2026 or newer Air Makeup Unit #6, fueled with natural gas	10 million Btus per hour	Not applicable
#36	2026 or newer Air Makeup Unit #7, fueled with natural gas	10 million Btus per hour	Not applicable
#37	2026 or newer Air Makeup Unit #8, fueled with natural gas	10 million Btus per hour	Not applicable
#38	2026 or newer Air Makeup Unit #9, fueled with natural gas	10 million Btus per hour	Not applicable
#39	2026 or newer Air Makeup Unit #10, fueled with natural gas	10 million Btus per hour	Not applicable
#40	2026 or newer Air Makeup Unit #11, fueled with natural gas	10 million Btus per hour	Not applicable
#41	2026 or newer Air Makeup Unit #12, fueled with natural gas	10 million Btus per hour	Not applicable
#42	2026 or newer Air Makeup Unit #13, fueled with natural gas	10 million Btus per hour	Not applicable
#43	2026 or newer Air Makeup Unit #14, fueled with natural gas	10 million Btus per hour	Not applicable
#44	2026 or newer Air Makeup Unit #15, fueled with natural gas	10 million Btus per hour	Not applicable
#45	2026 or newer Air Makeup Unit #16, fueled with natural gas	10 million Btus per hour	Not applicable
#46	2026 or newer Air Makeup Unit #17, fueled with natural gas	7.5 million Btus per hour	Not applicable
#47	2026 or newer Air Makeup Unit #18, fueled with natural gas	3.5 million Btus per hour	Not applicable

¹ – Emissions may be routed to Room Air Scrubber #1 or #2 only when the regenerative thermal oxidizer is down.

1.2 Other Emission Activities

Smithfield's proposed operations also include several emissions activities. Table 1-2 summarizes the other emissions activities as listed in the construction application.

Table 1-2 – Description of Proposed Other Units, Operations, and Processes

Description	Maximum Operating Rate	Control Device
Wastewater treatment	Not applicable	Not applicable
Diesel tank	2,000 gallons	Not applicable
Propane tank ¹	500 gallons	Not applicable
Blood meal storage	2,400 pounds per hour or 1.2 tons per hour	Not applicable
Blood meal loadout	2,400 pounds per hour or 1.2 tons per hour	Not applicable

Description	Maximum Operating Rate	Control Device
Rendering bone meal storage	13,000 pounds per hour or 6.5 tons per hour	Not applicable
Rendering bone meal loadout	13,000 pounds per hour or 6.5 tons per hour	Not applicable
Rendering bone meal pressing and milling operations	Not applicable	Not applicable
Rendering grease tanks	Not applicable	Not applicable
Ammonia refrigeration	Not applicable	Not applicable
12 roof top units, fueled with natural gas	1 million Btus per hour, each	Not applicable
10 roof top units, fueled with natural gas	0.5 million Btus per hour, each	Not applicable
10 make-up air units, fueled with natural gas	1 million Btus per hour, each	Not applicable
10 make-up air units, fueled with natural gas	2 million Btus per hour, each	Not applicable
Kitchen cooling ranges, griddles, ovens, etc., fueled with natural gas	2 million Btus per hour	Not applicable
8 satellite hot water heaters, fueled with natural gas	1 million Btus per hour, each	Not applicable
Miscellaneous welfare units, fueled with natural gas	<3.5 million Btus per hour	Not applicable

¹ – Propane is to fuel forklifts.

2.0 New Source Performance Standards

DANR reviewed the New Source Performance Standards listed in 40 CFR Part 60 and determined the following standards may be applicable to the proposed construction.

2.1 Standards Applicable to Generators – Subpart IIII

DANR's review of the New Source Performance Standards determined that 40 CFR Part 60, Subpart IIII may be applicable. Subpart IIII is applicable to owners and operators of stationary compression ignition internal combustion engines that meet one of the following:

1. Manufacturers of stationary compression ignition internal combustion engines with a displacement of less than 30 liters per cylinder where the model year is 2007 or later for engines that are not fire pump engines or model year 2008 or later for engines that are fire pump engines;
2. Owners or operators of stationary compression ignition internal combustion engines that commence construction after July 11, 2005, where the compression ignition internal combustion engine is manufactured after April 1, 2006, and is not a fire pump engine or manufactured as a certified National Fire Protection Association fire pump engine after

July 1, 2006; or

3. Owners or operators of stationary compression ignition internal combustion engines that modified or reconstructed their stationary compression ignition internal combustion engines after July 11, 2005.

Smithfield is proposing to construct two distillate oil-fired emergency generators that will be manufactured after 2008. The proposed generators are considered compression ignition engines. Therefore, the generators are applicable to Subpart IIII and must meet the following standards:

- 2026 or newer emergency generator that is not a fire pump;
- Displacement of less than 10 liters per cylinder
- Greater than or equal to 450 kilowatts but less 560 kilowatts;
- EPA Tier 3 Certified; and
- Emission standards in Table 2-1.

Table 2-1 – Emission Limits for Emergency Engines

	Nonmethane Hydrocarbon + Nitrogen Oxide	Carbon Monoxide	Particulate Matter
Grams per kilowatt-hour ¹	4.0	3.5	0.20
Pounds per million Btu	0.90	0.79	0.05

¹ – To convert from grams per kilowatt-hour to pounds per million Btu, use the following equation:

$$\left(\frac{\text{pounds}}{\text{MMBtu}}\right) = \frac{\text{Emission Factor} \left(\frac{\text{grams}}{\text{kilowatt} - \text{hour}}\right) \times 0.0022 \left(\frac{\text{pounds}}{\text{gram}}\right) \times 0.35 \times 1,000,000 \left(\frac{\text{Btus}}{\text{MMBtu}}\right)}{3,412 \left(\frac{\text{Btus}}{\text{kilowatt} - \text{hour}}\right)}$$

2.2 Standards Applicable to Generators – Subpart JJJJ

The provisions of 40 CFR Part 60, 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 engines that commence modification or reconstruction after June 12, 2006.

Smithfield is proposing to construct two distillate oil fired emergency generators. These engines are considered compression ignition engines and therefore, are not applicable to Subpart JJJJ.

2.3 Standards Applicable to Boilers – Subparts D, Da, Db, and Dc

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

1. 40 CFR Part 60, Subpart D: applicable to a steam generator with a maximum operating rate of 250 million Btu per hour or more and commenced construction after August 17, 1971;
2. 40 CFR Part 60, Subpart Da: Standards for Electric Utility Steam Generating Units. This subpart is applicable to each utility generating unit that is capable of combusting more than 73 megawatts (250 million Btu per hour) heat input of fossil fuel (either alone or in combination with any other fuel) that commenced construction, modification, or reconstruction after September 18, 1978;
3. 40 CFR Part 60, Subpart Db: applicable to a steam generator with a maximum operating rate of 100 million Btu per hour or more and commenced construction after June 19, 1984; and
4. 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 Btu per hour but less than or equal to 100 million Btu per hour and commenced construction after June 9, 1989.

Smithfield is proposing to construct four natural gas-fired boilers. All four boilers have a maximum operating rate of 60.243 million Btus per hour. Therefore, the four boilers are applicable to Subpart Dc.

2.4 Standards Applicable to Storage Tanks – K, Ka, Kb, and Kc

There are four New Source Performance Standards for storage vessels. The four standards are applicable to the following storage vessels:

1. 40 CFR Part 60, Subpart K: applicable to storage vessels for petroleum liquids capable of storing greater than 40,000 gallons and commenced construction after June 11, 1973, but prior to May 19, 1978;
2. 40 CFR Part 60, Subpart Ka: applicable to storage vessels for petroleum liquids capable of storing greater than 40,000 gallons and commenced construction after May 18, 1978;
3. 40 CFR Part 60, Subpart Kb: applicable to storage vessels for volatile organic liquids capable of storing 75 cubic meters (approximately 19,813 gallons) or greater and commenced construction after July 23, 1984. This subpart does not apply to storage vessels with a capacity greater than or equal to 151 m³ (approximately 40,000 gallons) storing a liquid with a maximum true vapor pressure less than 3.5 kilopascals (kPa) or with a capacity greater than or equal to 75 m³ but less than 151 m³ storing a liquid with a maximum true vapor pressure less than 15.0 kPa; and
4. 40 CFR Part 60, Subpart Kc: applicable to storage vessels for volatile organic liquids capable of storing greater than 20,000 gallons that commenced construction after October 4, 2023. This subpart does not apply to storage vessels with a maximum true vapor pressure less than 0.25 psia (1.7 kPa) or more than 204.9 kPa.

Smithfield is proposing to construct a 2,000-gallon diesel storage tank and a 500 gallon propane storage tank. Therefore, the proposed tanks are not applicable to Subpart K, Ka, Kb, or Kc.

2.5 Other New Source Performance Standards

DANR reviewed the other New Source Performance Standards and determined there are no other standards applicable to the proposed construction.

3.0 New Source Review

In accordance with Administrative Rules of South Dakota (ARSD) 74:36:10:01, the 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. Smithfield is located near Sioux Falls, South Dakota, which is in attainment or unclassifiable for all the criteria air pollutants regulated under the Clean Air Act. Therefore, Smithfield's proposed construction is not subject to a New Source Review.

4.0 Prevention of Significant Deterioration

A Prevention of Significant Deterioration 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 Prevention of Significant Deterioration program:

1. Total suspended particulate (TSP);
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 (SO₂);
5. Nitrogen oxides (NO_x);
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 Prevention of Significant Deterioration 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. A facility must trigger one of the major source thresholds for another

regulated pollutant before greenhouse gas emissions can be considered under the Prevention of Significant Deterioration permitting program. This applies to both new Prevention of Significant Deterioration program sources as well as major source modifications.

Smithfield may be one of the 28 listed source categories for Prevention of Significant Deterioration regulations under fossil-fuel boilers (or combination thereof) totaling more than 250 million British thermal units per hour heat input. Smithfield has a combined fossil fuel fired boiler heat input of 241 million Btu per hour, which is less than 250 million Btus per hour. Therefore, Smithfield is not one of the 28 named source categories and the major source threshold for the facility is 250 tons per year of any regulated air pollutant.

4.1 Potential Emissions

DANR 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, DANR 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 uncontrolled 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 uncontrolled emissions are not realistic of the actual emissions and are used only to identify which air quality permit is applicable to Smithfield.

4.2 Proposed Limits

In the application, Smithfield implies that the potential uncontrolled emissions would be greater than 250 tons per year. Therefore, Smithfield proposed facility-wide limits as part of the proposed construction permit application to maintain the potential to emit less than the Prevention of Significant Deterioration applicability thresholds. DANR will consider these proposed limitations in its review of the facility's potential to emit. The limits are summarized in Table 4-1.

Table 4-1 – Description of Proposed Limits

Unit	Description
Fuel burning	Natural gas usage shall not exceed 1,950 million standard cubic feet per year
Smokehouses	Wood usage shall not exceed 595 tons per year

4.2.1 Potential Emissions – Natural Gas Combustion

Smithfield's proposed facility includes several natural gas-fired units. Smithfield has requested facility-wide natural gas usage limit of 1,950 million cubic feet per 12-month rolling total. The emission factors for natural gas combustion are derived from AP-42, 1.4, Tables 1.4-1 and 1.4-2, April 2026 and are shown in Table 4-1.

Table 4-3 – Emission Factors for Natural Gas Combustion

	TSP	PM₁₀	PM_{2.5}	SO₂	NO_x	CO	VOC
Pounds per million cubic feet	7.6	7.6	7.6	0.6	50	84	5.5

Potential emissions from natural gas combustion are calculated using Equation 4.1, the natural gas usage limit, and the emission factors from Table 4-3. The results are shown in Table 4-4.

Equation 4.1 – Potential Emission from Natural Gas Combustion

$$\text{Potential} \left(\frac{\text{tons}}{\text{year}} \right) = \frac{1,950 \left(\frac{\text{MMft}^3}{\text{year}} \right) \times \text{Emission factor} \left(\frac{\text{pounds}}{\text{MMft}^3} \right)}{2,000 \left(\frac{\text{pounds}}{\text{ton}} \right)}$$

Table 4-4 – Potential Emissions from Natural Gas Combustion (tons per year)

	TSP	PM₁₀	PM_{2.5}	SO₂	NO_x	CO	VOC
Natural gas combustion	7.41	7.41	7.41	0.59	48.75	81.90	5.36

4.2.2 Potential Emissions – Generators

Smithfield’s proposed construction includes two distillate oil-fired emergency generators, each with a maximum operating rate of 500 kilowatts. AP-42 classifies generators with a heat rating less than or equal to 600 horsepower (447 kilowatts) as small industrial engines; therefore, Units #28 and #29 are considered small industrial engines. The emission factors for small industrial engines are derived from AP-42, 3.3, Table 3.4-1, April 2025, and shown in Table 4-4. The sulfur dioxide emission factor for small industrial engines is not representative of distillate oil sulfur content. Therefore, DANR will use the sulfur dioxide emission factor for large stationary engines. The emission factor is derived from AP-42, 3.4, Table 3.4-1, April 2025, and shown in Table 4-5.

Table 4-5 – Emission Factors for Distillate Oil-fired Generators (pounds per million Btu)

	TSP	PM₁₀	PM_{2.5}	SO₂	NO_x	CO	VOC
Subpart III (Table 2-1)	0.05	0.05	0.05	-	0.79	0.90	-
AP-42	-	-	-	1.01S ¹	-	-	0.35

¹ – S is the sulfur dioxide emission factor, which is based on the sulfur content of the fuel in percent. The sulfur content was assumed to be 15 parts per million or 0.0015 percent.

The application lists the generator’s output in terms of kilowatts. DANR converted the output rating to an estimated input rating using Equation 4.2 and based on the conversion factors of 3,412 Btus per kilowatt-hour, 1,000,000 Btus per million Btu, and a generator efficiency of 35 percent. The results of the conversion are shown in Table 4-6.

Equation 4.2 – Generator Conversion

$$\text{Input Capacity} \left(\frac{\text{MMBtus}}{\text{hour}} \right) = \frac{\text{Heat Output (kilowatts)} \times 3,412 \left(\frac{\text{Btus}}{\text{kilowatt} - \text{hour}} \right)}{\text{Efficiency} \times 1,000,000 \left(\frac{\text{Btus}}{\text{MMBtu}} \right)}$$

Table 4-6 – Generator Heat Input Capacity

Unit	Output Capacity (kilowatts)	Efficiency	Estimated Heat Input Capacity (million Btus per hour)
#28	500	35%	4.87
#29	500	35%	4.87

Units #28 and #29 are for emergency-use only. Therefore, DANR will calculate potential emissions based on 500 operating hours per year.

The potential emissions for Units #28 and #29 were calculated using Equation 4.3, the heat input from Table 4-6, the listed emission factors from Table 4-5, and 500 operating hours per year. The results are displayed in Table 4-7.

Equation 4.3 – Potential Emissions Calculations from Emergency Generator

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

Table 4-7 – Generator Potential Emissions (tons per year)

Unit	Fuel Type	TSP	PM ₁₀	PM _{2.5}	SO ₂	NO _x	CO	VOC
#28	Distillate oil	0.06	0.06	0.06	0.00	0.96	1.10	0.43
#29	Distillate oil	0.06	0.06	0.06	0.00	0.96	1.10	0.43
Total		0.12	0.12	0.12	0.00	1.92	2.20	0.86

4.2.3 Potential Emissions – Smoke Generation

Smithfield is proposing to construct 13 smoke generators, which are fueled with natural gas and electricity. Smithfield has accepted a facility-wide natural gas usage limit. Therefore, all emissions associated with natural gas combustion are already accounted for. The smoke generators have a maximum usage capacity of 0.013 tons per hour, each, of wood chips.

Smithfield provided emission factors for carbon monoxide and particulate matter for the smokehouses, which are shown below in Table 4-8. The carbon monoxide emission factor is based on stack test data from the Smithfield facility in Denison, Iowa. The test data from the performance test report for a similar unit to the proposed smoke generators. Smithfield provided particulate matter stack test data from their existing facility in Sioux Fall for a similar unit to the proposed smoke generators. The stack test data was used as emission factors because it was the most recent and complete data available to the department. It should be noted that both emission factors are uncontrolled.

Emission factors for meat smoking are derived from AP-42, 9.5.2, Table 9.5.2-2, September 1995. Table 4-8 shows the volatile organic compound emission factors for the smoke generators. The emission factors apply to wood chips or wood logs. Smithfield has the ability to use both wood chips and logs in the smoke generators.

Table 4-7 – Emission Factors for Smoke Generators (pounds per ton of wood)

Description	TSP	PM ₁₀	PM _{2.5}	SO ₂	NO _x	CO	VOC
Emission factors from stack test	131 ¹	131 ¹	131 ¹	-	-	500 ³	-
AP-42	-	-	-	- ²	- ²	-	44 ²

¹ – Uncontrolled emission factors for particulate matter were obtained from stack test data performed on a similar smoke generator unit from Smithfield’s Sioux Falls, South Dakota facility in 2023;

² – Emission factors were obtained from AP-42 Section 9.5.2 for uncontrolled batch smoke generators; and

³ – Uncontrolled emission factor for CO was obtained from stack test data performed on a similar smoke generator unit from Smithfield’s Denison, Iowa facility in 2019.

As stated above, Smithfield proposed a facility-wide wood usage limit of 595 tons per any 12-month rolling period. Therefore, potential emissions will be calculated based on the wood usage limit, the emission factors from Table 4-8, and Equation 4.4. The results are shown in Table 4-8.

Equation 4.4 – Potential Smoke Generator Emissions

$$Potential \left(\frac{\text{tons}}{\text{year}} \right) = \frac{595 \left(\frac{\text{tons}}{\text{year}} \right) \times Emission Factor \left(\frac{\text{pounds}}{\text{ton}} \right)}{2,000 \left(\frac{\text{pounds}}{\text{ton}} \right)}$$

Table 4-8 – Potential Emissions from Smoke Generators (tons per year)

Unit	TSP	PM ₁₀	PM _{2.5}	SO ₂	NO _x	CO	VOC
Smoke Generators	38.97	38.97	38.97	-	-	149	13.09

4.2.4 Potential Emissions – Blood Dryer

The blood dryer, fueled with natural gas, produces emissions from both fuel burning and drying blood. Emissions from fuel burning are calculated in Section 4.2.1.

DANR used the emission factors for Meat Rendering Plants from AP-42, Table 9.5.3-2, September 1995, for particulate emission factors. The section indicates that all the filterable particulate collected is PM₁₀ in size and represents emissions from a natural gas fired dryer. Both filterable and condensable emission factors were used to calculate particulate matter emission factors (1.22 pounds per ton of product).

Smithfield processes 6,500 pounds of blood per hour and produces 600 pounds of dry product per hour or 0.30 tons per hour. Equation 4.6 and the particulate emission rate were used to calculate the potential particulate emissions for drying the blood. Table 4-9 displays the potential emissions from the blood dryer.

Equation 4.6 – Particulate calculations for blood dryer (tons per year)

$$\text{Potential Emissions} \left(\frac{\text{tons}}{\text{year}} \right) = \frac{\text{Emission Factor} \left(\frac{\text{pounds}}{\text{ton}} \right) \times \text{Product} \left(\frac{\text{tons}}{\text{hour}} \right) \times 8,760 \left(\frac{\text{hours}}{\text{year}} \right)}{2,000 \left(\frac{\text{pounds}}{\text{ton}} \right)}$$

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

Unit	Fuel Type	TSP	PM ₁₀	PM _{2.5}
#7	Drying	1.60	1.60	1.60

4.2.5 Potential Emissions – Tanks

Smithfield's proposed construction includes a diesel storage tank, propane tank, ammonia tank, and rendering grease tanks. Smithfield provided potential emissions from the tanks based on EPA TANKS 5.1 program. DANR agrees with the estimates, which are displayed in Table 4-10.

Table 4-10 – Potential Emissions from Tanks (tons per year)

Unit	VOC
Tanks	0.00

4.2.6 Potential Emissions – Liquid Smoke Drenching

Smithfield's proposed facility includes a liquid smoke drenching machine. Smithfield provided potential emissions for the liquid smoke drenching machine in the application. DANR agrees with the estimates, which are displayed in Table 4-11.

Table 4-11 – Potential Emissions from Liquide Smoke (tons per year)

Unit	VOC
Liquid smoke machine	2.45

4.2.7 Potential Emissions – Other Emission Activities

Smithfield's proposed construction includes several other emission activities. The other emission activities include several natural gas-fired units (i.e. 22 roof top units and 20 make-up units, kitchen equipment, eight hot water heaters, and several miscellaneous welfare units). As mentioned in Section 4.2.1, Smithfield has accepted a facility-wide natural gas usage limit. Therefore, all emissions associated with natural gas combustion are already accounted for.

Smithfield's proposed facility includes bone meal storage and loadout and rendering bone meal storage and loadout. Emission factors bone and meal processing were derived from AP-42, Table 9.5.3-2, September 1995, and shown in Table 4-12.

Table 4-12 – Bone and Meal Emission Factors (pounds per ton)

	TSP	PM ₁₀	PM _{2.5}
Storage and loadout	0.0008	0.0008	0.0008

Potential emissions from the one meal storage and loadout are calculated using Equation 4.6, the emission factors from Table 4-12, and the operating rates from Table 1-2. The results are shown in Table 4-13.

Table 4-13 – Bone and Meal Potential Emissions (tons per year)

	TSP	PM₁₀	PM_{2.5}
Blood meal storage	0.00	0.00	0.00
Bone meal loadout	0.00	0.00	0.00
Rendering bone meal storage	0.02	0.02	0.02
Rendering bone meal loadout	0.02	0.02	0.02
Total	0.04	0.04	0.04

4.2.8 Summary of Potential Emission

Table 4-14 summarizes the results of the potential emission calculations for each of the fuel types.

Table 4-14 – Potential Emissions Summary (tons per year)

Unit	TSP	PM₁₀	PM_{2.5}	SO₂	NO_x	CO	VOC
Natural gas combustion	7.41	7.41	7.41	0.59	48.75	81.90	5.36
Generators	0.12	0.12	0.12	0.00	1.92	2.20	0.86
Smoke Generators	38.97	38.97	38.97	-	-	149	13.09
Blood dryer	1.60	1.60	1.60	-	-	-	-
Tanks	-	-	-	-	-	-	0.00
Liquid smoke	-	-	-	-	-	-	2.45
Other emission activities	0.04	0.04	0.04	-	-	-	-
Total	48	48	48	1	51	233	22

4.3 Prevention of Significant Deterioration Summary

Based on Table 4-14, Smithfield's potential criteria air pollutant emissions are less than 250 tons per year. Therefore, the proposed construction is not applicable to the Prevention of Significant Deterioration program. Based on the United States Supreme Court's decision and because Smithfield is not applicable to the Prevention of Significant Deterioration program, a review for greenhouse gas emissions is not warranted or required.

5.0 National Emission Standards for Hazardous Air Pollutants

DANR reviewed the National Emissions Standards for Hazardous Air Pollutants under 40 CFR Part 61 and determined there are no standards applicable to Smithfield's proposed construction.

6.0 Maximum Achievable Control Technology Standards

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.

6.1 Potential Hazardous Air Pollutant Emissions

DANR 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, DANR 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.

DANR 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, DANR 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 – Natural Gas Combustion

Smithfield's proposed facility includes several natural gas-fired units. Smithfield has requested a facility-wide natural gas usage limit of 1,950 million cubic feet per 12-month rolling total. The hazardous air pollutant emission factor for natural gas combustion is derived from AP-42, 1.4, Table 1.4-3, April 2026 and is shown in Table 6-1.

Table 6-1 – Emission Factors for Natural Gas Combustion

	HAPs
Pounds per million cubic feet	1.882

Potential hazardous air pollutant emissions from natural gas combustion are calculated using Equation 4.1, the natural gas usage limit from Table 4-1, and the emission factor from Table 6-1. The results are shown in Table 6-2.

Table 6-2 – Potential Emissions from Natural Gas Combustion (tons per year)

Description	Hazardous Air Pollutants
Natural gas combustion	1.83

6.1.2 Potential Hazardous Air Pollutant Emissions – Generators

Smithfield's proposed construction includes two distillate oil-fired emergency generators, each with a maximum operating rate of 500 kilowatts. The hazardous air pollutant emission factor for

small industrial engines is derived from AP-42, 3.3, Table 3.3-2, April 2025, and is 0.00379 pounds per million Btu.

Units #28 and #29 are for emergency-use only. Therefore, DANR will calculate potential emissions based on 500 operating hours per year.

The potential emissions for Units #28 and #29 were calculated using Equation 4.3, the heat input from Table 4-5, the hazardous air pollutant emission factor, and 500 operating hours per year. The results are displayed in Table 6-3.

Table 6-3 – Generator Potential Emissions (tons per year)

Unit	HAPs
#28	0.005
#29	0.005
Total	0.01

6.1.3 Potential Hazardous Air Pollutant Emissions – Smoke Generation

Smithfield is proposing to construct 13 smoke generators, which are fueled with natural gas and electricity. Smithfield has accepted a facility-wide natural gas usage limit. Therefore, all emissions associated with natural gas combustion are already accounted for. The smoke generators have a maximum usage capacity of 0.013 tons per hour, each, of wood chips.

The hazardous air pollutant emission factor for meat smoking is derived from AP-42, 9.5.2, Table 9.5.2-2, September 1995. Table 6-4 shows the hazardous air pollutant emission factor for the smoke generators. The emission factors apply to wood chips or wood logs. Smithfield has the ability to use both wood chips and logs in the smoke generators.

Table 6-4 – Emission Factors for Smoke Generators

Description	TSP
Pounds per ton of wood	1.3

As stated above, Smithfield accepted a facility-wide wood usage limit of 595 tons per 12-month rolling period. Therefore, potential hazardous air pollutant emissions will be calculated based on the wood usage limit, the hazardous air pollutant emission factor from Table 6-3, and Equation 4.4. The results are shown in Table 6-5.

Table 6-5 – Potential Emissions from Smoke Generators (tons per year)

Description	Hazardous Air Pollutants
Smoke Generators	0.38

6.1.4 Potential Hazardous Air Pollutant Emissions – Blood Dryer

There are no hazardous air pollutant emissions associated with the blood drying itself. Therefore, potential hazardous air pollutant emissions will not be evaluated.

Hazardous air pollutant emissions associated with the fuel burning are determined above in section 6.1.1.

6.1.5 Potential Hazardous Air Pollutant Emissions – Tanks

Smithfield's proposed construction includes a diesel storage tank, propane tank, ammonia tank, and rendering grease tanks. Smithfield provided potential hazardous air pollutant emissions from the tanks based on EPA TANKS 5.1 program. DANR agrees with the estimates which are displayed in Table 6-6.

Table 6-6 – Potential Emissions from Tanks (tons per year)

Description	Hazardous Air Pollutants
Tanks	0.00

6.1.6 Potential Hazardous Air Pollutant Emissions – Liquid Smoke Drenching

Smithfield's proposed construction includes a liquid smoke drenching machine. Smithfield provided potential hazardous air pollutant emissions for the liquid smoke drenching machine in the application. DANR agrees with the estimates which are displayed in Table 6-7.

Table 6-7 – Potential Emissions from Liquid Smoke (tons per year)

Description	Hazardous Air Pollutants
Liquid smoke	2.92

6.1.7 Potential Hazardous Air Pollutant Emissions – Other Emission Activities

Smithfield's proposed construction includes several other emission activities. The other emission activities include several natural gas-fired units (i.e. 22 roof top units and 20 make-up units, kitchen equipment, eight hot water heaters, and several miscellaneous welfare units). As mentioned in Section 6.1.1, Smithfield has accepted a facility-wide natural gas usage limit. Therefore, all hazardous air pollutant emissions associated with natural gas combustion are already accounted for.

Smithfield's proposed facility includes bone meal storage and loadout and rendering bone meal storage and loadout. There are no hazardous air pollutant emissions associated with the bone meal itself. Therefore, potential hazardous air pollutant emissions will not be evaluated.

6.1.8 Summary of Hazardous Air Pollutant Emissions

Table 6-8 provides a summary of the facility-wide potential hazardous air pollutant emissions.

Table 6-8 – Summary of Hazardous Air Pollutants (tons per year)

Description	Hazardous Air Pollutants
Natural gas combustion	1.83
Generators	0.01
Smoke Generators	0.38

Description	Hazardous Air Pollutants
Blood dryer	-
Tanks	0.00
	2.92
Other emission activities	-
Total	2.22

Based on the emissions summary in Table 6-8, 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 hazardous air pollutants. Therefore, Smithfield is considered an area source for hazardous air pollutants.

6.2 Maximum Achievable Control Technology Standards

DANR reviewed the Maximum Achievable Control Technology Standards under 40 CFR Part 63 and determined the following standards may be applicable to the proposed facility.

6.2.1 Standards Applicable to Generators – Subpart ZZZZ

In accordance with 40 CFR Part 63, Subpart ZZZZ – National Emission 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). Generators constructed prior to June 12, 2006, are considered existing generators.

In accordance with 40 CFR § 63.6595(c), a unit subject to 40 CFR Part 60, Subpart IIII or JJJJ and 40 CFR Part 63, Subpart ZZZZ, must meet the applicable requirements in Subpart ZZZZ by meeting the requirements in Subparts IIII or JJJJ. Therefore, the proposed emergency generators are applicable to Subpart IIII and therefore meet the requirements of Subpart ZZZZ.

6.2.2 Standards Applicable to Boilers – Subpart DDDDD

Subpart DDDDD establishes national emission limitations and work practice standards for industrial, commercial, and institutional boilers and process heaters located at major sources of hazardous air pollutants. This subpart also establishes requirements to demonstrate initial and continuous compliance with the emission limitations and work practice standards.

Smithfield is not considered a major source of hazardous air pollutants and therefore, is not applicable to this subpart.

6.2.3 Standards Applicable to Boilers – Subpart JJJJJ

On March 21, 2011, EPA finalized the Maximum Achievable Control Technology standard under 40 CFR Part 63, Subpart JJJJJ. This rule applies to all new or existing industrial,

commercial, and institutional boilers located at an area source of hazardous air pollutants. An existing boiler is defined as a boiler where construction or reconstruction occurred prior to June 4, 2010.

Per 40 CFR § 63.11193, all industrial, commercial, or institutional boiler located an area source of hazardous air pollutants are subject to this subpart unless the boilers meet the exceptions outlined in 40 CFR § 63.11195, which includes gas-fired boilers. Per the definition outlined in 40 CFR § 63.11237, a *Gas-fired boiler* includes any boiler that burns gaseous fuels not combined with any solid fuels and burns liquid fuel only during periods of gas curtailment, gas supply interruption, startups, or periodic testing on liquid fuel. The proposed boilers are fueled exclusively with natural gas and therefore are exempt from Subpart JJJJJ.

6.2.4 Other Maximum Achievable Control Technology Standards

DANR reviewed the other Maximum Achievable Control Technology standards and determined there are no other standards currently applicable to the proposed facility.

7.0 State Requirements

7.1 Permit Type

South Dakota's construction permit program uses the applicability thresholds for the Title V and Minor operating permit programs to determine if a construction permit is required and the timelines to submit an application for the operating permit.

Any source operating in South Dakota that meets the definition of a major source for any criteria pollutant is required to obtain a Title V air quality operating permit. A major source is defined as having the potential to emit greater than 100 tons per year of a criteria pollutant, greater than or equal to 10 tons per year of a single hazardous air pollutant, or greater than or equal to 25 tons per year of a combination of hazardous air pollutants, or if the source is applicable to a New Source Performance Standards or Maximum Achievable Control Technology Standards. Based on the potential emissions in Table 4-13, Smithfield is required to obtain a Title V air quality operating permit. Because a Title V air quality operating permit is needed, Smithfield is required to obtain an air quality construction permit.

The air quality construction permit will contain conditions that will limit wood usage and natural gas usage in order to maintain emissions below the major source threshold. Smithfield will be required to submit quarterly reports.

7.2 Insignificant Activities

In accordance with Administrative Rules of South Dakota (ARSD) 74:36:04:03, the following emission units are exempt from inclusion in the air quality operating permit unless the source has requested federally enforceable permit conditions related to the emission unit to avoid needing a

Part 70 operating permit, Prevention of Significant Deterioration preconstruction permit, or New Source Review preconstruction permit:

1. One or more incinerators of less than 100 pounds per hour combined burning capacity that combust municipal or household waste;
2. A mobile internal combustion engine, including those in autos, trucks, tractors, airplanes, locomotives, and boats;
3. Laboratory equipment used exclusively for chemical or physical analysis;
4. A unit that has a heat input capability of not more than 3,500,000 Btus per hour, except for units fueled with wood or coal;
5. An air conditioning or ventilating system not designed to remove air pollutants from equipment;
6. Routine housekeeping or plant upkeep activities such as painting buildings, re-tarring roofs, or paving parking lots;
7. A unit that has the potential to emit two tons or less per year of any criteria pollutant before the application of control equipment. However, the criteria pollutant emissions from the unit must be included in determining whether the source is a minor source; and
8. A unit that has the potential to emit two tons or less per year of any hazardous air pollutant. However, the hazardous air pollutant emissions from the unit must be included in determining whether the source is a major source.

In accordance with Administrative Rules of South Dakota (ARSD) 74:36:05:04.01, insignificant activities are not required to be included in a Title V air quality operating permit. Table 7-1 provides a list of insignificant activities and the reason the unit meets the definition of an insignificant activity.

Table 7-1 – List of insignificant activities

Description	Citation
Diesel storage tank	7,8
Propane tank	7,8
Blood meal storage	7,8
Blood meal loadout	7,8
Rendering bone meal storage	7,8
Rendering bone meal loadout	7,8
Rendering bone meal pressing and milling operations	7,8
Rendering grease tanks	7,8
Ammonia refrigeration	7,8

Smithfield's proposed operation includes several small natural gas-fired units. These units meet the definition of insignificant activities. However, because Smithfield accepted a natural gas usage limit, these units must be included. DANR will permit the small natural gas units as a combined unit, i.e. Unit #48.

7.3 State Emissions Limits

Administrative Rules of South Dakota (ARSD) 74:36:06:02 establishes state emission limits for total suspended particulate matter and sulfur dioxide. State emission limits are applicable to fuel burning and process industry units. Units classified as insignificant activities are not applicable to the state emission limits.

In accordance with Administrative Rules of South Dakota (ARSD) 74:36:06:01, a unit that must comply with a total suspended particulate matter or sulfur dioxide emission limit under the New Source Performance Standards, Maximum Achievable Control Technology Standards, the Acid Rain Program, or the Prevention of Significant Deterioration Program is exempt from having to meet the state's total suspended particulate matter emission limits. In this case, the proposed generators are required to meet a particulate emission limit in 40 CFR Part 60, Subpart IIII and not applicable to the state's particulate limit.

Unit #26 does not emit particulate matter or sulfur dioxide and therefore is not applicable to the state emission limits.

Units #9 through #21 do not emit sulfur dioxide and therefore are not applicable to the state sulfur dioxide emission limit.

7.2.1 Particulate Emission Limits

Administrative Rules of South Dakota (ARSD) 74:36:06:02(1), establish state emission limits for total suspended particulate matter for fuel burning units. In accordance with Administrative Rules of South Dakota (ARSD) 74:36:06:02(1)(a), a fuel burning unit with heat input value less than 10 million Btu per hour may not exceed 0.6 pounds of particulate emissions per million Btu of heat input. Units #22, #23, #24, #25, #27, #46, #47, and #48 each have a maximum operating rate less than 10 million Btus per hour; therefore, the emission limit is 0.6 pounds per million Btu. In accordance with Administrative Rules of South Dakota (ARSD) 74:36:06:02(1)(b), a fuel burning unit with a heat input value equal to or greater than 10 million Btu per hour may not exceed the particulate emission limit determined using Equation 7.1. Units #1, #2, #3, #4, #5, #6, #7, #8, #30, #31, #32, #33, #34, #35, #36, #37, #38, #39, #40, #41, #42, #43, #44, and #45 are applicable to this limit. The particulate emission limits are displayed in Table 7-2.

Equation 7.1 – State particulate limit for Units over 10 million Btu

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

Where:

- E = allowable emission rate in pounds per million Btu of heat input; and
- H = maximum heat input, in million Btu per hour.

Administrative Rules of South Dakota (ARSD) 74:36:06:03(1), establish state emission limits for total suspended particulate matter for process industry units. Smithfield has several smokehouses that are considered process industry units as they process meat by smoking (Units #9, #10, #11, #12, #13, #14, #15, #16, #17, #18, #19, #20, and #22).

The application did not provide a maximum process weight rate for each smokehouse. Therefore, DANR will calculate the process weight rate for each smokehouse based on the information listed below and Equation 7.2.

- Maximum meat smoked per batch is 32,256 pounds;
- A batch takes 6 hours to smoke; and
- A batch requires 26 pounds of woodchips per hour.

Equation 7.2 – Weight Rate Calculation (pounds per hour)

$$\text{Process Rate} \left(\frac{\text{pounds}}{\text{hour}} \right) = \frac{32,256(\text{pounds})}{6(\text{hours})} + 26 \left(\frac{\text{pounds}}{\text{hour}} \right) = 5,376 \left(\frac{\text{pounds}}{\text{hour}} \right) + 26 \left(\frac{\text{pounds}}{\text{hour}} \right)$$

$$\text{Process Rate} = 5,402 \left(\frac{\text{pounds}}{\text{hour}} \right)$$

Based on Equation 7.2, the maximum process weight rate for each smokehouse is 5,402 pounds per hour.

In accordance with Administrative Rules of South Dakota (ARSD) 74:36:06:03(1)(a), a process unit with a process weight rate up to 60,000 pounds per hour shall be determined by Equation 7.3. As shown in Equation 7.2, the process rate for the smokehouses is less than 60,000 pounds per hour. Therefore, Equation 7.3 can be used to determine the state emission limit for particulate matter. The particulate emission limits are displayed in Table 7-2.

Equation 7.3 – State particulate limit for process units up to 60,000 pounds per hour

$$E = 4.10P^{0.67}$$

Where:

- E = rate of emission in pounds per hour; and
- H = process weight rate in tons per hour.

Table 7-2 provides 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 7-2 – State Particulate Matter Emission Limit Comparison

Unit	Emission Rate	State Emission Limit
#1	0.0076 pounds per million Btu	0.5 pounds per million Btu
#2	0.0076 pounds per million Btu	0.5 pounds per million Btu
#3	0.0076 pounds per million Btu	0.5 pounds per million Btu
#4	0.0076 pounds per million Btu	0.5 pounds per million Btu
#5	0.0076 pounds per million Btu	0.5 pounds per million Btu
#6	0.0076 pounds per million Btu	0.5 pounds per million Btu
#7	0.0076 pounds per million Btu	0.5 pounds per million Btu
#8	0.0076 pounds per million Btu	0.5 pounds per million Btu
#9	1.70 pounds per hour	8 pounds per hour
#10	1.70 pounds per hour	8 pounds per hour

Unit	Emission Rate	State Emission Limit
#11	1.70 pounds per hour	8 pounds per hour
#12	1.70 pounds per hour	8 pounds per hour
#13	1.70 pounds per hour	8 pounds per hour
#14	1.70 pounds per hour	8 pounds per hour
#15	1.70 pounds per hour	8 pounds per hour
#16	1.70 pounds per hour	8 pounds per hour
#17	1.70 pounds per hour	8 pounds per hour
#18	1.70 pounds per hour	8 pounds per hour
#19	1.70 pounds per hour	8 pounds per hour
#20	1.70 pounds per hour	8 pounds per hour
#21	1.70 pounds per hour	8 pounds per hour
#22	0.0076 pounds per million Btu	0.6 pounds per million Btu
#23	0.0076 pounds per million Btu	0.6 pounds per million Btu
#24	0.0076 pounds per million Btu	0.6 pounds per million Btu
#25	0.0076 pounds per million Btu	0.6 pounds per million Btu
#27	0.0076 pounds per million Btu	0.6 pounds per million Btu
#30	0.0076 pounds per million Btu	0.6 pounds per million Btu
#31	0.0076 pounds per million Btu	0.6 pounds per million Btu
#32	0.0076 pounds per million Btu	0.6 pounds per million Btu
#33	0.0076 pounds per million Btu	0.6 pounds per million Btu
#34	0.0076 pounds per million Btu	0.6 pounds per million Btu
#35	0.0076 pounds per million Btu	0.6 pounds per million Btu
#36	0.0076 pounds per million Btu	0.6 pounds per million Btu
#37	0.0076 pounds per million Btu	0.6 pounds per million Btu
#38	0.0076 pounds per million Btu	0.6 pounds per million Btu
#39	0.0076 pounds per million Btu	0.6 pounds per million Btu
#40	0.0076 pounds per million Btu	0.6 pounds per million Btu
#41	0.0076 pounds per million Btu	0.6 pounds per million Btu
#42	0.0076 pounds per million Btu	0.6 pounds per million Btu
#43	0.0076 pounds per million Btu	0.6 pounds per million Btu
#44	0.0076 pounds per million Btu	0.6 pounds per million Btu
#45	0.0076 pounds per million Btu	0.6 pounds per million Btu
#46	0.0076 pounds per million Btu	0.6 pounds per million Btu
#47	0.0076 pounds per million Btu	0.6 pounds per million Btu
#48	0.0076 pounds per million Btu	0.6 pounds per million Btu

Based on the comparison in Table 7-2, Smithfield is capable of not exceeding the state particulate matter emission limits.

7.3.2 Sulfur Dioxide Emission Limits

In accordance with Administrative Rules of South Dakota (ARSD) 74:36:06:02(2), South Dakota's sulfur dioxide emission limits for a fuel burning and processing units is 3.0 pounds per million Btu heat input. Therefore, Units #1, #2, #3, #4, #5, #6, #7, #8, #22, #23, #24, #25, #27,

#30, #31, #32, #33, #34, #35, #36, #37, #38, #39, #40, #41, #42, #43, #44, #45, #46, #47, and #48 are applicable to the state sulfur dioxide emission limit. The limit comparison is shown in Table 7-3.

Table 7-3 – State Sulfur Dioxide Emission Limit Comparison

Unit	Emission Rate	State Emission Limit
#1	0.0006 pounds per million Btu	3.0 pounds per million Btu
#2	0.0006 pounds per million Btu	3.0 pounds per million Btu
#3	0.0006 pounds per million Btu	3.0 pounds per million Btu
#4	0.0006 pounds per million Btu	3.0 pounds per million Btu
#5	0.0006 pounds per million Btu	3.0 pounds per million Btu
#6	0.0006 pounds per million Btu	3.0 pounds per million Btu
#7	0.0006 pounds per million Btu	3.0 pounds per million Btu
#8	0.0006 pounds per million Btu	3.0 pounds per million Btu
#22	0.0006 pounds per million Btu	3.0 pounds per million Btu
#23	0.0006 pounds per million Btu	3.0 pounds per million Btu
#24	0.0006 pounds per million Btu	3.0 pounds per million Btu
#25	0.0006 pounds per million Btu	3.0 pounds per million Btu
#27	0.0006 pounds per million Btu	3.0 pounds per million Btu
#30	0.0006 pounds per million Btu	3.0 pounds per million Btu
#31	0.0006 pounds per million Btu	3.0 pounds per million Btu
#32	0.0006 pounds per million Btu	3.0 pounds per million Btu
#33	0.0006 pounds per million Btu	3.0 pounds per million Btu
#34	0.0006 pounds per million Btu	3.0 pounds per million Btu
#35	0.0006 pounds per million Btu	3.0 pounds per million Btu
#36	0.0006 pounds per million Btu	3.0 pounds per million Btu
#37	0.0006 pounds per million Btu	3.0 pounds per million Btu
#38	0.0006 pounds per million Btu	3.0 pounds per million Btu
#39	0.0006 pounds per million Btu	3.0 pounds per million Btu
#40	0.0006 pounds per million Btu	3.0 pounds per million Btu
#41	0.0006 pounds per million Btu	3.0 pounds per million Btu
#42	0.0006 pounds per million Btu	3.0 pounds per million Btu
#43	0.0006 pounds per million Btu	3.0 pounds per million Btu
#44	0.0006 pounds per million Btu	3.0 pounds per million Btu
#45	0.0006 pounds per million Btu	3.0 pounds per million Btu
#46	0.0006 pounds per million Btu	3.0 pounds per million Btu
#47	0.0006 pounds per million Btu	3.0 pounds per million Btu
#48	0.0006 pounds per million Btu	3.0 pounds per million Btu

Based on Table 7-3, Smithfield is capable of meeting the state’s sulfur dioxide emission limit.

7.3.3 Visible Emissions

Visible emissions are applicable to any unit that discharges to the ambient air. In accordance with Administrative Rules of South Dakota (ARSD) 74:36:12, a facility may not discharge into

the ambient air more than 20 percent opacity for all units. Smithfield must control the opacity at less than 20 percent for all units.

7.4 Performance Tests

In accordance with Administrative Rules of South Dakota (ARSD) 74:36:11:02, the Secretary may require a performance test, if necessary, to demonstrate compliance with the emission limits in an air quality permit. Therefore, DANR will require a stack performance test on one of the smoke generators (Units #9 – #21) for particulate matter to verify compliance with the state emission limit. Because the potential carbon monoxide emissions are so close to the Prevention of Significant Deterioration threshold (i.e. 250 tons), DANR will also require one of the smoke generators (Units #9 – #21) be test for carbon monoxide. The performance tests shall be conducted within 180 days of initial startup.

7.5 Title V Air Quality Operating Permit

In accordance with Administrative Rules of South Dakota (ARSD) 74:36:05:08(1), Smithfield will be required to submit a Title V air quality operating permit application within 12 months of commencing operation.

8.0 Recommendation

Smithfield is required to construct and operate within the requirements stipulated in the following regulations:

- ARSD 74:36:06 – Regulated Air Pollutant Emissions;
- ARSD 74:36:07 – New Source Performance Standards;
- ARSD 74:36:08 – Maximum Achievable Control Technology Standards;
- ARSD 74:36:11 – Performance Testing;
- ARSD 74:36:12 – Control of Visible Emissions; and
- ARSD 74:36:20 – Construction Permits for New Sources and Modifications.

Based on the information submitted in the air quality construction application, DANR recommends conditional approval of a construction permit for Smithfield's proposed facility in Sioux Falls, South Dakota. Questions regarding this permit review should be directed to Samantha Olmstead, Engineer III, Department of Agriculture and Natural Resources – Air Quality Program.