



**Statement of Basis**

**Title V Air Quality Operating Permit Renewal**

**Pacer Corporation White Bear Mica Plant  
Custer, South Dakota**

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## 1.0 Background

On March 1, 2005, the South Dakota Department of Environment and Natural Resources (DENR) issued a Title V air quality operating permit to Pacer Corporation (Pacer) for construction and operation of its White Bear Mica Plant located south of Custer on Highway 385. The permit contains enforceable permit conditions which maintain potential emissions below the major source threshold under the Prevention of Significant Deterioration program.

On May 18, 2006, EPA received a “Petition for Objection to Issuance of Operating Permit for Pacer Mica Processing Plant” which involved the Title V air quality operating permit modification that occurred on April 18, 2006. As of the date of this review, EPA has not acted on this petition. On August 4, 2009, DENR received an application to renew the Title V air quality operating permit. The permit was renewed on February 2, 2010 after the entire permit was open for public comment during a 30-day public comment period. DENR did not receive any comments and submitted the proposed Title V air quality operating permit to EPA for their 45-day review. EPA did not object to the issuance of the permit or receive a petition objecting to the issuance of the proposed permit. DENR believes the petition is no longer valid since the permit that the petitioner objected too is no longer valid.

On August 1, 2014, DENR received an application to renew the Title V air quality operating permit. Permit condition 4.2 states that if a timely and complete application for permit renewal is submitted six months prior to the date of expiration, then the existing permit shall not expire and the conditions of that permit shall remain in effect until the Secretary takes final action on the permit renewal application. DENR considered the renewal application timely and Pacer is allowed to operate under the Title V air quality operating permit that expired on February 2, 2015, until DENR takes action on the renewal application. The application was considered complete on April 7, 2015.

The facility dries and mills mica ore into a fine powder after which it is screened and air classified into finish products of various sizes. The finished product is stored in tanks for bagging and then shipped by trucks to customers. The mica ore is mined at a different location.

### 1.1 Operational Description

Table 1.1 is a list of permitted equipment from the existing Title V air quality operating permit.

**Table 1.1 - Description of Permitted Units, Operations, and Processes**

Unit	Description	Maximum Operating Rate	Control Device
#1	Six Sweco vibrating screens (SW101, SW102, SW103, SW104, SW105, and SW106)	Each Sweco vibrating screen is rated at 4 tons per hour	DC101 – 2005 Flex-Kleen pulse jet baghouse with a maximum flow rate of 3,000 cubic feet per minute and containing 49 bags
	Bucket elevator BE108 transfers material to surge bin BN101	The surge bin storage capacity is 360 cubic feet and can be loaded at a maximum rate of 30 tons per hour	

<b>Unit</b>	<b>Description</b>	<b>Maximum Operating Rate</b>	<b>Control Device</b>
	Ball mill	Ball mill capable of milling 8 tons per hour	
	Two sew top baggers (STB101 and STB102)	Each sew top bagger is capable of bagging 4 tons per hour	
<b>#2</b>	Bucket elevator BE100	Bucket elevator rated at 30 tons per hour	DC102 – 2005 Mikropul pulse jet baghouse with a maximum flow rate of 9,500 cubic feet per minute and containing 340 bags
	Gustafson tower dryer fueled with propane	Tower dryer rated at 20 tons per hour with a burner rated at 12 million Btus per hour	
<b>#3</b>	DC103 – Cage mill (CM101)	Cage mill is capable of processing 15 tons per hour	DC103 – 1971 Flex-Kleen pulse jet baghouse with a maximum flow rate of 5,000 cubic feet per minute and containing 68 bags
	Bucket elevator (BE102)	Bucket elevator is capable of transferring 15 tons per hour	
<b>#4</b>	Two Kason centrifugal screeners	Each screener is capable of processing 1,000 pounds of material per hour	DC01 – Flex-Kleen pulse jet baghouse with a maximum flow rate of 1,500 cubic feet per minute and containing 25 bags
	Bucket elevator BE11 transfers material to surge bin BN04	The surge bin storage capacity is 40 cubic feet and can be loaded at a maximum rate of eight tons per hour	
	Conveyor belt CB03	CB03 is capable of transferring 8 tons per hour	
	Bucket elevator BE13 transfers material to bin hopper BN06	The bin hopper's storage capacity is 40 cubic feet and can be loaded at a maximum rate of 15 tons per hour	
<b>#5</b>	Bucket elevators BE02 and BE03 load material into surge bins BN01 and BN02	BN01 and BN02 are capable of storing 40 cubic feet each and are loaded by BE02 and BE03 at a maximum rate of 20 tons per hour per bucket elevator	DC02 – 2005 Flex-Kleen pulse jet baghouse with a maximum flow rate of 3,000 cubic feet per minute and containing 49 bags
	Bucket elevators BE04 and BE05	Bucket elevators BE04 and BE05 are each capable of transferring 8 tons per hour	
	Conveyor belt CB01	CB01 is capable of transferring 8 tons per hour	
<b>#6</b>	Conveyor belt CB100A and	CB100A and CB100B are	DC104 – 2006 Flex-

<b>Unit</b>	<b>Description</b>	<b>Maximum Operating Rate</b>	<b>Control Device</b>
	CB100B	capable of transferring 15 tons per hour	Kleen pulse jet baghouse with a maximum flow rate of 3,500 cubic feet per minute and containing 49 bags
	Conveyor belt CB103	CB103 is capable of transferring 15 tons per hour	

## **1.2 Changes to Operation**

Pacer indicated in the application the two Kason centrifugal screeners and conveyor belt (CB03) associated with Unit #4 are no longer in operation. The Bucket Elevator BE11 is still used to transfer material to Surge Bin (BN04). The bucket elevator (BE13) is still used to transfer material into bin hopper (BN06). Therefore, DENR will remove the two Kason centrifugal screeners and conveyor belt from the description of Unit #4 in Table 1.1.

## **2.0 New Source Performance Standards**

DENR reviewed the New Source Performance Standards and determined that the following may be applicable to Pacer near Custer, South Dakota:

### **2.1 Standards of Performance for Nonmetallic Mineral Processing Plants**

ARSD 74:36:07:27, adopts by reference 40 CFR, Part 60, Subpart OOO, which apply to nonmetallic mineral processing plants that commenced construction or modification after August 31, 1983. Mica is classified as a nonmetallic mineral under 40 CFR, Part 60, Subpart OOO.

Pacer Corporation's nonmetallic mineral processing plant was constructed after August 13, 1983 and prior to April 22, 2008. Therefore, Pacer's mica plant is subject to this new source performance standard and is required to meet the applicable requirements for a nonmetallic mineral processing plant constructed prior to April 22, 2008.

The initial testing under Subpart OOO was completed on March 17, 2006 and May 9, 2006. Therefore, Pacer has satisfied the initial stack and opacity test requirement for 40 CFR Part 60 Subpart OOO and the permit conditions will not be included in the Title V air quality operating permit.

### **2.2 Other Applicable New Source Performance Standards**

DENR reviewed the other New Source Performance Standards and determined there are no other standards applicable to Pacer.

### **3.0 New Source Review**

ARSD 74:36:10:01 states that New Source Review (NSR) 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. Pacer is located near Custer which is in attainment or unclassifiable for all the pollutants regulated under the Clean Air Act. Therefore, Pacer is not subject to NSR 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 pollutant. The following is a list of regulated pollutants under the PSD program:

1. Total suspended particulate (PM);
2. Particulate with a diameter less than or equal to 10 microns (PM<sub>10</sub>);
3. Particulate matter with a diameter less than or equal to 2.5 microns (PM<sub>2.5</sub>);
4. Sulfur dioxide (SO<sub>2</sub>);
5. Nitrogen oxides (NO<sub>x</sub>);
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 pollutant. The major source threshold for all other sources is 250 tons per year of any regulated pollutant. Nonmetallic mineral processing plants are not one of the 28 named PSD source categories. Therefore, the major source threshold is 250 tons per year.

On June 24, 2014, the US Supreme Court ruled that greenhouse gases may not be regulated under the PSD program unless the facility requires a PSD permit for a regulated air pollutant.

#### **4.1 Potential 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. Potential uncontrolled emissions are not realistic of the actual emissions and are used only to identify which air quality permit(s) and state and federal regulations are applicable.

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.

**4.1.1 Potential Emissions**

DENR will estimate particulates from the baghouses based on 0.022 grains per cubic foot which is the emission limit from the New Source Performance Standard in Subpart OOO. It is assumed the emission rate for total suspended particulate matter, particulate with a diameter less than or equal to 10 microns (PM<sub>10</sub>) and particulate with a diameter less than or equal to 2.5 microns (PM<sub>2.5</sub>) are equivalent. Equation 4-1 will convert the emission rate from grains per cubic foot to pounds per hour based on the flow rates listed in the application for the appropriate baghouse. Table 4.1 lists the flow rates for the baghouses and the associated particulate emission rate.

**Equation 4-1 – Potential emission factor (pounds per hour)**

$$PM \frac{\text{pounds}}{\text{hour}} = 0.022 \frac{\text{grains}}{\text{cubic foot}} \times 1.4386 \times 10^{-4} \frac{\text{pounds}}{\text{grain}} \times \text{flow rate} \frac{\text{cubic feet}}{\text{min ute}} \times 60 \frac{\text{min utes}}{\text{hour}}$$

**Table 4.1 – Potential Emission Rates**

Baghouse	(cubic feet per minute)	Potential Emission Rate
		(pounds per hour)
DC101	3,000	0.57
DC102	9,500	1.80
DC103	5,000	0.95
DC104	3,500	0.66
DC01	1,500	0.28
DC02	3,000	0.57

Equation 4-2 was used to calculate the potential emissions from the baghouses and the results are summarized in Table 4.3.

**Equation 4-2 – Potential Emissions**

$$\text{Potential Emissions} \frac{\text{tons}}{\text{year}} = \text{Emission rate} \frac{\text{lbs}}{\text{hr}} \times 8,760 \frac{\text{hrs}}{\text{yr}} \div 2,000 \frac{\text{lbs}}{\text{ton}}$$

**4.1.2 Potential Emissions for Dryer**

The emission factors for the dryer fired by propane were derived for industrial boilers with heat capacities between 10 and 100 million BTU heat input from Table 1.5-1 in AP-42. The particulate emissions were already calculated based on the baghouse since the dryer emissions are passed through the baghouse associated with Unit #2 and will not be calculated in this section. The emission factors were converted from pounds per 1,000 gallons to pounds per million British thermal unit using Equation 4-3. The emission factors for the boiler are

summarized in Table 4.2.

**Equation 4-3 – Convert from lbs /10<sup>3</sup> gal to lbs/MMBTU**

$$\text{Emission Factor } \left( \frac{\text{lb}}{\text{MMBTU}} \right) = \frac{\text{Emission Factor } \left( \frac{\text{lb}}{10^3 \text{ gal}} \right)}{91.5 \left( \frac{\text{MMBTU}}{10^3 \text{ gal}} \right)}$$

**Table 4.2 –Emission Factors for Dryer**

Pollutant	SO <sub>2</sub>	NO <sub>x</sub>	CO	VOC <sup>1</sup>
Propane (lbs/10 <sup>3</sup> gallons)	0.018	13	7.5	N/A
Propane (lbs/MMBTU)	0.0002	0.14	0.082	0.005

<sup>1</sup>There is no VOC emission factor for Propane; therefore, the VOC emission factor for Natural Gas was used.

Equation 4-4, Table 4.2, and heat input of 12 million BTU per hour were used to calculate the potential emissions from the dryer fired by propane. There is no air pollution control device associated with the dryer, therefore, potential uncontrolled and controlled are equivalent. See Table 4.3 for a summary of potential emissions from the dryer.

**Equation 4-5 – Uncontrolled Emission Calculations for Propane**

$$\text{Potential emissions } \frac{\text{tons}}{\text{yr}} = \left( \frac{\text{Emission factor } \frac{\text{lbs}}{\text{MMBTU}} \times 8,760 \frac{\text{hrs}}{\text{yr}} \times 12 \frac{\text{MMBTU}}{\text{hr}}}{2,000 \frac{\text{lbs}}{\text{ton}}} \right)$$

**4.1.3 Summary of Potential Emissions**

Table 4.3 provides a summary of the potential emissions.

**Table 4.3 – Potential Emissions (tons per year)**

Unit	TSP	PM <sub>10</sub>	PM <sub>2.5</sub>	SO <sub>2</sub>	NO <sub>x</sub>	CO	VOCs
#1 (DC101)	2.5	2.5	2.5	-	-	-	-
#2 (DC102)	7.9	7.9	7.9	0.01	7.4	4.3	0.3
#3 (DC103)	4.2	4.2	4.2	-	-	-	-
#6 (DC104)	2.9	2.9	2.9	-	-	-	-
#4 (DC01)	1.2	1.2	1.2	-	-	-	-
#5 (DC02)	2.5	2.5	2.5	-	-	-	-
<b>Total</b>	<b>21.2</b>	<b>21.2</b>	<b>21.2</b>	<b>0.0</b>	<b>7.4</b>	<b>4.3</b>	<b>0.3</b>

Based on the information in Table 4.3, the potential emissions from Pacer’s operations are less than 250 tons per year for all regulated air pollutants and Pacer is considered a minor source under the PSD program and not subject to a PSD review.

## **5.0 National Emission Standards for Hazardous Air Pollutants**

Presently, there are no finalized or promulgated National Emissions Standards for Hazardous Air Pollutants standards under ARSD 74:36:08, as referenced to 40 CFR Part 61, for the type of operations used by Pacer.

## **6.0 Maximum Achievable Control Technology Standards**

Presently, there are no finalized or promulgated Maximum Achievable Control Technology standards stated in ARSD 74:36:08, as referenced to 40 CFR Part 63, for the type of operations used by Pacer.

## **7.0 State Requirements**

Based on the particulate limit for new source performance standards for nonmetallic mineral processing plants, Pacer's potential emissions are less than the major source threshold under the Title V air quality operating permit program and is considered a minor source. However, Pacer is subject to the new source performance standard for nonmetallic mineral processing plants. In accordance with the Administrative Rules of South Dakota (ARSD) 74:36:05:03(2), any source subject to a standard or regulation promulgated under § 111 of the Clean Air Act (new source performance standards) is required to obtain a Title V air quality operating permit. Therefore, Pacer is required to obtain a Title V air quality operating permit.

### **7.1 Opacity Limit**

The opacity limit is derived from ARSD 74:36:12:01. The owner or operator is not allowed to discharge into the ambient air from a single unit of emissions an air pollutant of a density equal to or greater than that designated as 20 percent opacity. All five units are subject to an opacity limit of seven percent by the new source performance standards for nonmetallic mineral processing plants. This opacity limit is stricter than 20 percent opacity. Therefore, compliance with the new source performance standard opacity limit will demonstrate compliance with the state's opacity limit. The state's opacity limit will not be specified in the permit.

### **7.2 Particulate and Sulfur Dioxide Emission Limits**

Particulate and sulfur dioxide emission limits are derived from ARSD 74:36:06. All of the units are subject to the particulate limits for process units. DC102 is also subject to the sulfur dioxide limit because the units burn propane as part of its process. In accordance with ARSD 74:36:06:01, if a unit is subject to a particulate and/or sulfur dioxide emission limit in a new source performance standard, the state particulate and/or sulfur dioxide emission limit is not applicable. All six units are subject to a particulate limit under the new source performance standard under Subpart OOO and not subject to the state's particulate limit.

In accordance with 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.

Table 7.1 displays the comparison of the state's sulfur dioxide emission limit with the sulfur dioxide emission rate for the dryer.

**Table 7.1 - Sulfur Dioxide Limit Comparison**

<b>Sulfur Dioxide (lbs/MMBtus)</b>		
<b>Unit</b>	<b>Potential Emission Rate</b>	<b>Emission Limit</b>
<b>#2</b>	0.0002	3.0

Based on the comparison in Table 7.1, Pacer is capable of operating in compliance with the state's sulfur dioxide air emission limit.

### **7.3 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. Pacer is required to meet unit specific opacity, particulate, and sulfur dioxide emission limits.

Periodic monitoring for the opacity and particulate emission limits will be based on the applicable periodic monitoring requirements in the new source performance standards under Subpart OOO. Periodic monitor of sulfur dioxide is not warranted because of the sulfur content of propane fuel guarantees the dryer is in compliance with the sulfur dioxide limit. DENR will require Pacer to conduct maintenance on the baghouses to ensure they are operating properly.

### **7.4 Compliance Assurance Monitoring**

Compliance assurance monitoring is applicable to permit applications received on or after April 20, 1998, from major sources applying for a Title V air quality operating permit. Pacer's original application to construct and operate a new mica plant was received on November 10, 2004. Therefore, compliance assurance monitoring is applicable to any unit that meets the following criteria:

1. The unit is subject to an emission limit or standard for the applicable regulated air pollutant;
2. The unit uses a control device to achieve compliance with any such emission limit or standard; and
3. The unit has potential uncontrolled emissions of the applicable regulated air pollutant that are equal to or greater than 100 percent of the amount, in tons per year, required for a source to be classified as a major source.

All six units are subject to compliance assurance monitoring for particulate matter. All six units have a particulate emission limit, a control device, and potential uncontrolled emissions greater than the major source threshold under the Title V air quality operating permit program. In accordance with 40 CFR § 64.2(b)(1)(i), if the applicable standard was proposed by EPA after November 15, 1990 pursuant to section 111 or 112 of the Act, the unit is exempt from

compliance assurance monitoring. This New Source Performance Standard was proposed after November 15, 1990. Therefore, compliance assurance monitoring for these six units will be based on the monitoring requirements in the applicable subpart.

## **7.5 Air Fees**

Title V sources are subject to an annual air quality fee. The fee consists of an administrative fee and a per ton fee based on the actual tons per year of pollutant emitted. The pollutants that are charged are particulate matter, sulfur dioxides, nitrogen oxides, volatile organic compounds and hazardous air pollutants. The actual emissions are calculated by DENR and are based on information provided by the source.

## **8.0 Recommendation**

Pacer is required to meet the particulate limits in the New Source Performance Standards which maintain potential emissions below the major source threshold under the PSD program. Therefore, DENR is removing the permit conditions in the existing permit related to the PSD exemption. Pacer is still required to operate within the requirements stipulated in the following regulations:

1. ARSD 74:36:05 – Operating permits for Part 70 sources;
2. ARSD 74:36:06 – Regulated air pollutant emissions;
3. ARSD 74:36:07 – New source performance standards;
4. ARSD 74:36:11 – Performance testing;
5. ARSD 74:36:12 – Control of visible emissions. and
6. ARSD 74:37:01 – Air pollution control program fees.

Based on the information submitted in the air quality permit application, DENR recommends conditional approval of a Title V air quality operating permit renewal for Pacer's facility near Custer, South Dakota. Questions regarding this permit review should be directed to Earl Berg, Engineer I, Department of Environmental and Natural Resources, Air Quality Program.