Statement of Basis

Minor Air Quality Operating Permit

Twin City Fans, Ltd.
Sioux Falls Spinning Company

Sioux Falls, South Dakota

South Dakota Department of Environment and Natural Resources

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1.0 Background

On October 1, 2015, the Department of Environment and Natural Resources (DENR) received and application from Twin City Fan Companies, Ltd (Twin City Fan) to be considered for a minor air quality operating permit.

Twin City Fan manufactures commercial and industrial fans and blowers in Sioux Falls, South Dakota. The primary Standard Industrial Code (SIC) for the facility is 3564 – General Industrial Machinery and Equipment – Industrial and Commercial Fans and Blowers and Air Purification Equipment.

Twin City Fan fabricates fans and blowers from mild steel, aluminum, and stainless steel. The operations at the facility include cutting and forming mild steel, welding, and grinding machine parts. The parts are then assembled, cleaned with a phosphate cleaning solution, and painted. The paints at the facility include powder coats, enamels, water based paints, epoxies, and primers.

1.1 Existing Equipment

The following equipment will be considered under Twin City Fan's minor air quality operating permit application:

Unit	Description	Maximum Operating Rate	Control Device
#1	Paint Booth #1 – 2014 Col-Met, air-atomized	67,200 cubic feet per minute	Dry Filter Pads
#2	2011 – King natural gas fired furnace	2.1755 million Btus per hour	Not Applicable

2.0 New Source Performance Standards

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

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. Twin City Fan is located in Sioux Falls, South Dakota, which is in attainment or unclassifiable for all the pollutants regulated under the Clean Air Act. Therefore, Twin City Fan 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 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 (SO2);
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.

Twin City Fan is not one of the 28 named PSD sources; therefore, the potential threshold is 250 tons per year. On June 24, 2014, the Supreme Court decided greenhouse gases may not be regulated under the PSD program unless the facility requires a PSD permit for the other regulated air pollutants. Therefore, greenhouse gases will not be evaluated unless Twin City Fan is a major source under the PSD program.

4.1 Potential Emissions for Criteria 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.

Potential emissions for each applicable pollutant are calculated from the maximum design capacity listed in the application and assume 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 type of air quality operating permit and potential regulations Twin City Fan may be required to meet.

4.1.1 Potential Emissions from Paint Booths

The emission factors were derived from the material safety data sheets for the products used in the paint booth. The potential emission rate will be estimated from the amount of paint and solvent used and the amount of time the booths are operated. Twin City Fan stated in the application that the paint booths operate 8 hours per day, 260 days per year (2,080 hours per year). Potential emissions are calculated assuming that the facility operates 24 hours per day 365 days per year (8,760 hours per year). The potential emissions for the spray booth will be calculated by using the multiplying factor derived in Equation 4.1.

Equation 4.1 – Multiplying Factor for Spray Booth Operation

$$Multiplying\ Ratio = \frac{8{,}760\ potential\ operating\ hours/year}{2{,}080\ actual\ operating\ hours/year} = 4.21$$

The ratio will be used to multiply the estimated product usage from Twin City Fan's application to adjust usage to represent 8,760 hours per year of operation.

Uncontrolled potential emissions are those that would occur with no air emission controls. There is no air pollution control equipment for volatile organic compounds associated with the spray booth operation. Therefore, the potential uncontrolled and controlled volatile organic compound emissions are equal. The potential volatile emissions from the spray booth will be based on the estimated amount of products submitted in the air quality permit application. Table 4-1 summarizes the product information that was in the application.

Table 4-1 – Product Usage

Paint	Actual Usage (gallons per year)	Potential Usage[1] (gallons per year)	Volatile Organic Compound (pounds per gallon)
AMERON P	30	126.3	0.75
CARBOLIN 0	2	8.42	7.93
CARBOLIN 1	6	25.26	1.79
CARBOLIN 2	5	21.05	0
BUTYL CEO	50	210.5	3.5
KEM HIGH	10	42.10	4.17
BLACK	0.563	2.37	6.8
YELLOW	40	168.4	2.91
MULT-E-PC	20	84.2	5.64
WHITE BO	25	105.3	4.92
BLACK EPC	115	484.15	5.23
EPOXY 179	780	3,284	5.14
TCF BLUE 2	160	673.6	5.15
TCF AEROW	125	526.3	5.47
1702 GRAY	400	1,684	5.94
3.5 RED OX	16.193	68.19	6.09
TCF GRAY	31.408	132.2	4.05
TCF SATIN	20	84.2	4.60
ASA-61 GR	575	2,421	3.36

Paint	Actual Usage (gallons per year)	Potential Usage[1] (gallons per year)	Volatile Organic Compound (pounds per gallon)
AH500-955	3	12.63	5.40
GARDENER	18	75.78	4.92
3.5 TCF SA	27	113.7	4.32
0.7 PLURAL	16	67.36	6.16
FIBERGLASS 1	7	29.47	4.23
DARK BROWN	1	4.21	6.16
FIBERGLASS 2	2.25	9.47	5.96
TCF BALD	2.438	10.26	5.70
MUNSELL 1	2.156	9.08	5.66
MUNSELL 2	6	25.26	5.09
DTM FAST	53	223.1	4.75
KOMATSU	6	25.26	6.40
RAL-900t	40	168.4	1.91
MULT-E-PC	2	8.42	6.32
CLEAR SPRAY	11	46.31	5.39
RAL-1023 S	2.25	9.47	5.82
KOMATSU	15	63.15	2.25
TC COMPO	19	79.99	6.30
68 HS ONE	8	33.68	5.10
AMERICOAT 1	10	42.1	7.25
AMERICOAT 2	5	21.05	7.5

[1] – Multiply the actual usage by the multiplying ration of 4.21.

Equation 4.2, the potential usage from Table 4-1, the products volatile organic compounds (VOC) content in Table 4-1, and a conversion factor of 2,000 pounds per ton were used to calculate the potential VOC emissions from the spray booth.

Equation 4.2 – Potential VOC Emissions

$$Potential\ VOC\ Emissions\left(\frac{tons}{year}\right) = \frac{Potential\ Usage\left(\frac{gallons}{year}\right) \times VOC\ Content\left(\frac{pounds}{gallon}\right)}{2{,}000\left(\frac{pounds}{ton}\right)}$$

Table 4-2 shows the potential volatile organic emissions from the paint booth.

Table 4-1 – Potential VOC Emissions

Paint	VOC Emissions (tons per year)
AMERON P	0.047
CARBOLIN 0	0.033
CARBOLIN 1	0.023
CARBOLIN 2	0
BUTYL CEO	0.37
KEM HIGH	0.088

Paint	VOC Emissions (tons per year)
BLACK	0.008
YELLOW	0.25
MULT-E-PC	0.24
WHITE BO	0.26
BLACK EPC	1.27
EPOXY 179	8.44
TCF BLUE 2	1.73
TCF AEROW	1.44
1702 GRAY	5.0
3.5 RED OX	0.21
TCF GRAY	0.27
TCF SATIN	0.19
ASA-61 GR	4.07
AH500-955	0.03
GARDENER	0.19
3.5 TCF SA	0.25
0.7 PLURAL	0.21
FIBERGLASS 1	0.062
DARK BROWN	0.013
FIBERGLASS 2	0.028
TCF BALD	0.029
MUNSELL1	0.026
MUNSELL2	0.075
DTM FAST	0.53
KOMATSU	0.081
RAL-900t	0.16
MULT-E-PC	0.027
CLEAR SPRAY	0.12
RAL-1023 S	0.028
KOMATSU	0.071
TC COMPO	0.25
68 HS ONE	0.085
AMERICOAT 1	0.15
AMERICOAT 2	0.079
Total	**26.43**

4.1.2 Potential Emissions from Heaters

Table 4-3 contains emission factors for Natural Gas combustion from Ap-42, Table 1.4-1. This will be used in Equation 4.3 to calculate the potential emissions.

Table 4-3 – Emission Factors for Natural Gas Combustion (pounds per million Btu)

	Pollutant						
	TSP	**PM_{10}**	**$PM_{2.5}$**	**SO_2**	**NOx**	**CO**	**VOC**
Emission Factor	0.0075	0.0075	0.0075	0.0006	0.1	0.08	0.003

Equation 4.3 – Total Potential Emissions

$$Potential\left(\frac{tons}{year}\right) = \frac{Heat\ Input\left(\frac{MMBtus}{hour}\right) \times 8{,}760\left(\frac{hours}{year}\right) \times Emission\ Factor\left(\frac{pounds}{MMBtu}\right)}{2{,}000\left(\frac{pounds}{year}\right)}$$

The results of Equation 4.3 are summarized in Table 4-4.

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

Unit	TSP	PM_{10}	$PM_{2.5}$	SO_2	NOx	CO	VOC
#2	0.07	0.07	0.07	0.006	0.1	0.8	0.03

4.2 Summary of Potential Emissions

Table 4-5 summarizes the potential emissions for the facility.

Table 4-5 – Potential Emission Summary (tons per year)

Description	TSP	PM_{10}	$PM_{2.5}$	SO_2	NOx	CO	VOC
Paint Booth	-	-	-	-	-	-	26.43
Unit #2	0.07	0.07	0.07	0.006	0.1	0.8	0.03
Total	**0**	**0**	**0**	**0**	**0**	**1**	**26**

4.3 PSD Summary

Twin City Fan does not have the potential to emit more than 250 tons per year of criteria air pollutants. Therefore, Twin City Fan is considered a minor source under the PSD program and not required to have a PSD permit. Since Twin City Fan does not require a PSD permit, greenhouse gases are not required to be reviewed.

5.0 National Emission Standards for Hazardous Air Pollutants

DENR reviewed the national emission standards for hazardous air pollutants and determined that there are no applicable subparts.

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.

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 Potential HAP Emissions – Paint Booth

The potential emissions are calculated assuming that the facility operates 24 hours a day, 365 days per year. Uncontrolled potential emissions are those that would occur with no emission controls. Dry filter media are used to control particulate matter; however, the filters do not control hazardous air pollutant (HAP) emissions. Twin City Fan submitted a table containing actual HAP emissions for the spray booth for the period from August 1, 2014 to July 31, 2015 for their facility paint booth in Sioux Falls, South Dakota. The potential emissions will be calculated using the multiplying factor of 4.21 calculated in Equation 4.1.

The actual and potential HAP emissions for the spray booths are summarized in Table 6-1.

Table 6-1 – Actual and Potential HAP Emissions from Paint Booth

Hazardous Air Pollutants	Actual	Potential
Xylene	0.5479	2.307
Methyl Ethyl Ketone	1.1867	4.996
Methyl isobutyl ketone	0.2736	1.152
Toluene	0.0390	0.164
Ethyl Benzene	0.1866	0.786
Naphthalene	0.0224	0.094
Methanol	0.0002	0.001
Total	**2**	**9**

6.2 Potential HAP Emissions – Fuel Burning Unit

The furnace is being fired with natural gas. The hazardous air pollutant emission factor for firing the furnace burning natural gas is derived from AP-42, Table 1.4-1, and is 0.0018 pounds per million Btus.

The potential hazardous air pollutant emissions were calculated using the heat rating for the furnace, the emission factor, and the operating hours with Equation 6.1. The results are shown in Table 6-2.

Equation 6.1 – Potential HAP Emissions from Fuel Burning

$$Potential\left(\frac{tons}{year}\right) = \frac{Heat\ Input\left(\frac{MMBtus}{hour}\right) \times 8{,}760\left(\frac{hours}{year}\right) \times Emission\ Factor\left(\frac{pounds}{MMBtu}\right)}{2{,}000\left(\frac{pounds}{year}\right)}$$

Table 6-3 – Potential HAP Emissions from Fuel Burning

Hazardous Air Pollutants	Potential
Furnace	0.02

6.3 Potential HAP Emissions Summary

Table 6-3 shows the summary of potential hazardous air pollutants from the paint booth and the furnace at Twin City Fan.

Table 6-3 – Potential HAP Emissions Summary

Hazardous Air Pollutants	Potential
Paint Booth	9
Fuel Burning	0.02
Summary	**9**

Twin City Fan's total hazardous air pollutants are less than the major source threshold for hazardous air pollutants. Therefore, Twin City Fan is considered an area source of hazardous air pollutants.

6.4 MACT Standards

The department reviewed the maximum achievable control technology (MACT) standards and determined that the following may be applicable.

6.4.1 ARSD 74:36:08:37 – 40 CFR Part 63, Subpart MMMM

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 hazardous air pollutants 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. The affected source is the collection of the following items:

1. All coating operations. A coating operation means equipment used to apply cleaning materials to a substrate to prepare it for coating application (surface preparation) or to remove dried coating; to apply coating to a substrate (coating application) and to dry or cure the coating after application; or to clean coating operation equipment (equipment cleaning);
2. All storage containers and mixing vessels in which coatings, thinners and/or other additives, and cleaning materials are stored or mixed;

3. All manual and automated equipment and containers used for conveying coatings, thinners, and/or other additives, and cleaning materials; and
4. All storage containers and all manual and automated equipment and containers used for conveying waste materials generated by a coating operation.

Miscellaneous metal parts and products include, but are not limited to, metal components of the following types of products as well as the products themselves: motor vehicle parts and accessories, bicycles and sporting goods, recreational vehicles, extruded aluminum structural components, railroad cars, heavy duty trucks, medical equipment, lawn and garden equipment, electronic equipment, magnet wire, steel drums, industrial machinery, metal pipes and numerous other industrial, household, and consumer products.

Twin City Fan is considered an area source of hazardous air pollutants. Therefore, the operations at the facility are not subject to this Maximum Achievable Control Technology standard.

6.4.2 ARSD 74:36:08:108 – 40 CFR Part 63, Subpart HHHHHH

DENR reviewed the national emission standards and determined that Twin City Fan may be applicable to 40 CFR Part 63, Subpart HHHHHH. This subpart is applicable to owners or operators of paint stripping operations, miscellaneous surface coating area sources and the spray application of coatings containing compounds of chromium (Cr) lead (Pb), manganese (Mn), nickel (Ni), or cadmium (Cd), to any part or product made of metal or plastic, or combinations of metal and plastic that are not motor vehicles or mobile equipment and considered an area source for hazardous air pollutants.

This subpart applies to sources using spray booths, ventilated prep stations, curing ovens, and associated equipment; spray guns and associated equipment, spray gun cleaning equipment

This subpart defines spray-applied coating operations as coatings that are applied using a hand-held device that creates an atomized mist of coating and deposits the coating on a substrate. For the purposes of this subpart, spray-applied coatings do not include the following materials or activities:

1. Coatings applied from a hand-held device with a paint cup capacity that is equal to or less than 3.0 fluid ounces (89 cubic centimeters); and
2. Surface coating application using powder coating, hand-held, non-refillable aerosol containers, or non-atomizing application technology, including, but not limited to, paint brushes, rollers, hand wiping, flow coating, dip coating, electro-deposition coating, web coating, coil coating, touch-up markers, or marking pens.

The Material Safety Data Sheets for the facility indicate that the coatings do not contain the listed compounds and Twin City Fan does not produce a motor vehicle or mobile equipment. Therefore, this subpart is not applicable to Twin City Fan.

6.4.3 ARSD 74:36:08:119 – 40 CFR Part 63, Subpart XXXXXX

DENR reviewed the national emission standards and determined that Twin City Fan may be applicable to 40 CFR Part 63, Subpart XXXXXX. The provisions of this subpart are applicable to an area source that is primarily engaged in the operations in one of the following nine source categories:

1. Electrical and Electronic Equipment Finishing Operations (NAICS codes 335999 and 335312);
2. Fabricated Metal Products (NAICS codes 332117 and 332999);
3. Fabricated Plate Work (Boiler Shops) (NAICS codes 332313, 332410, and 332420);
4. Fabricated Structural Metal Manufacturing (NAICS code 332312);
5. Heating Equipment, except Electric ((NAICS code 333414);
6. Industrial Machinery and Equipment Finishing Operations (NAICS codes 333120, 333132 and 333911);
7. Iron and Steel Forging (NAICS code 33211);
8. Primary Metal products Manufacturing (NAICS code 332618); and
9. Valves and Pipe Fittings (NAICS code 332919).

Twin City Fan has a Standard Industrial Classification Code of 3564 and a North American Industry Classification System code of 333412. Twin City Fan is not one of the nine operations applicable to this subpart. Therefore, Twin City Fan is not applicable to this subpart.

6.4.4 Other MACT Standards

The department reviewed the remaining maximum achievable control technology (MACT) standards and determined that no other MACT standards were applicable to Twin City Fan's operation.

7.0 State Requirements

7.1 Minor Permit

Any source operating in South Dakota that meets the requirements of the ARSD 74:36:04 are required to obtain a minor air quality operating permit. A minor permit is required if a source has the potential to emit more than 25 tons but less than 100 tons of a criteria pollutant. Twin City Fan has the potential to emit more than 25 tons of a criteria pollutant, volatile organic compounds, but less than 100 tons.

Therefore, Twin City Fan is required to obtain a minor air quality operating permit.

7.2 Insignificant Activities

As noted in ARSD 74:36:04:03(10), equipment that has the potential to emit less than two tons per year and is not applicable to a federal standard is considered an insignificant activity and is not included in a permit. Unit #2 meets this requirement and will not be included in the permit.

7.3 State Restrictions on Visible Emissions

Visible emissions are applicable to units that discharge into the ambient air. In accordance with ARSD 74:36:12, a facility may not discharge into the ambient air more than 20 percent opacity for all units. Twin City Fan must control the opacity at less than 20 percent for all units. Even though Unit #2 will not be included in the permit, Unit #2 must still meet the 20 percent opacity requirement.

7.4 State Emission Limits

Particulate and sulfur dioxide emission limits are derived from ARSD 74:36:06. Twin City Fan does not operate point sources which emit particulate matter or sulfur dioxide in amounts greater than the insignificant activities threshold of two tons per year. Therefore, the particulate matter and sulfur dioxide emission limits are not applicable.

7.5 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. Twin City Fan's application was received after April 20, 1998. However, Twin City Fan is considered a minor source. Therefore, compliance assurance monitoring is not applicable.

7.6 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. Twin City Fan will be receiving what is classified as a minor air quality operating permit. Therefore, periodic monitoring is not applicable to this facility.

8.0 Recommendation

Twin City Fan is required to operate within the requirements stipulated in the following regulations:

1. ARSD 74:36:04 – Operating Permits for Minor Sources;
2. ARSD 74:36:12 – Control of Visible Emissions.

Based on the information submitted in the air quality permit application, Twin City Fan is considered a minor source emitting less than 100 tons per year of any criteria pollutant and less than 10 tons of a single hazardous air pollutant and less than 25 tons of a combination of hazardous air pollutants. Therefore, the department recommends a minor air quality operating permit. Questions regarding this permit review should be directed to Samantha Olmstead, Engineer I, Department of Natural Resources, Air Quality Program.