**AIR EMISSION PERMIT NO. 13100005-001**

IS ISSUED TO

**NORTHFIELD ACQUISITION COMPANY**
**East and West Buildings**
1150 Sheldahl Road and 805 North Highway 3
Northfield, Dakota County, MN 55057-0170

The emission units, control equipment and emission stacks at the stationary source authorized in this permit are as described in the following permit application(s):

| Permit Application Type | Application Date |
|---|---|
| Total Facility Operating Permit | 06/15/1995 |

This permit supersedes all previous air emissions permits issued to this Facility, and authorizes the Permittee to operate and construct the stationary source at the address listed above unless otherwise noted in Table A. The Permittee must comply with all the conditions of the permit. Any changes or modifications to the stationary source must be performed in compliance with Minn. R. 7007.1150 to 7007.1500. Terms used in the permit are defined in the state air pollution control rules unless the term is explicitly defined in the permit.

**Permit Type:** Federal; Part 70/Limits to Avoid NSR

**Issue Date:** November 22, 2002

**Expiration:** November 22, 2007
All Title I Conditions do not expire.

Ann M. Foss
Major Facilities Section Manager
Majors and Remediation Division

for Karen A. Studders
Commissioner
Minnesota Pollution Control Agency

# TABLE OF CONTENTS

**NOTICE TO THE PERMITTEE:**

Your stationary source may be subject to the requirements of the Minnesota Pollution Control Agency's (MPCA) solid waste, hazardous waste, and water quality programs. If you wish to obtain information on these programs, including information on obtaining any required permits, please contact the MPCA general information number at:

| | |
|---|---|
| Metro Area | (651) 296-6300 |
| Outside Metro Area | 1-800-657-3864 |
| TTY | (651) 282-5332 |

The rules governing these programs are contained in Minn. R. chs. 7000-7105. Written questions may be sent to Minnesota Pollution Control Agency, 520 Lafayette Road North, St. Paul, Minnesota 55155-4194.

Questions about this air emission permit or about air quality requirements can also be directed to the telephone numbers and address listed above.

**PERMIT SHIELD**

Subject to the limitations in Minn. R. 7007.1800, compliance with the conditions of this permit shall be deemed compliance with the specific provision of the applicable requirement identified in the permit as the basis of each condition. Subject to the limitations of Minn. R. 7007.1800 and 7017.0100, subp. 2, notwithstanding the conditions of this permit specifying compliance practices for applicable requirements, any person (including the Permittee) may also use other credible evidence to establish compliance or noncompliance with applicable requirements.

**FACILITY DESCRIPTION**

The Permittee owns and operates a flexible printed circuit fabrication facility and manufactures specialty electronic products such as flexible printed circuitry, flexible composite laminates, and specialty engineering products. The stationary source consists of two buildings on either side of a county road called the East and West facilities. They are considered one stationary source under all air regulations. The types of emissions units include mixing, laminating, screen printing, plating, etching, stripping, material handling, and combustion of propane, natural gas and no. 2 fuel oil.

The main emissions are Volatile Organic Compounds (VOC) and Hazardous Air Pollutants (HAP), with lesser amounts of Particulate Matter and Particulate Matter less than 10 microns ($PM/PM_{10}$) and various other pollutants from the combustion of propane, natural gas, and No. 2 fuel oil. The Facility currently has two scrubbers for controlling ammonia and a catalytic oxidizer for controlling VOC emissions from the laminators.

The Facility received several air emissions permits from the MPCA starting in 1985. In 1996, the total facility permit was amended to allow for several new units. This amendment (No. 6 to 884-91-OT-2) also established a total facility emissions cap on VOCs that allowed the Facility to avoid major source classification for NSR. Those limits are carried forward in this permit. The Facility is a major source under the federal operation permits program (40 CFR pt. 70) and the National Emissions Standards for Hazardous Air Pollutants (NESHAPs, 40 CFR pt. 63).

The permit contains requirements that limit emissions of VOCs, HAPs, and PM/$PM_{10}$ and authorizes certain changes that can take place during the permit term.

**PERMIT APPLICATION**

The Permittee's Part 70 permit application was received on June 15, 1995. Supplemental submittals were received on the following dates: 1/11/2002, 2/12/2002, 2/21/2002, 3/18/2002, 5/01/2002, 6/04/2002, 6/05/2002, 6/10/2002, 6/17/2002, and 7/08/2002.

## TABLE A: LIMITS AND OTHER REQUIREMENTS

11/22/02

Facility Name: Northfield Acquisition Co - East & West

Permit Number: 13100005 - 001

**Table A contains limits and other requirements with which your facility must comply. The limits are located in the first column of the table (What To do). The limits can be emission limits or operational limits. This column also contains the actions that you must take and the records you must keep to show that you are complying with the limits. The second column of Table A (Why to do it) lists the regulatory basis for these limits. Appendices included as conditions of your permit are listed in Table A under total facility requirements.**

**Subject Item:** **Total Facility**

| What to do | Why to do it |
|---|---|
| SOURCE-SPECIFIC REQUIREMENTS | hdr |
| This permit establishes limits on the facility to keep it a minor source under New Source Review. The Permittee cannot make any change at the source that would make the source a major source under New Source Review until a permit amendment has been issued. This includes changes that might otherwise qualify as insignificant modifications and minor or moderate amendments. | Title I Condition: Limit to avoid classification as major source or modification under 40 CFR Section 52.21 and Minn. R. 7007.3000 |
| The Permittee shall not begin construction of any single project or projects that are connected or phased which will cause a total increase in actual emissions of greater than 99 tons per year for any criteria pollutant without first getting a permit amendment to authorize the project. Connected and phased have meanings as defined in Minn. R. 4410.0200 subps. 9b and 60. The Permittee shall not begin construction of any other project which is listed in Minn. R. 4410.4300 or Minn. R. 4410.4400 without first getting a permit amendment to authorize the project. Such projects may require the completion of an Environmental Assessment Worksheet or an Environmental Impact Statement prior to the amendment being issued. This is a state only requirement and is not enforceable by the EPA Administrator or citizens under the Clean Air Act. | Minn. R. 4410.4300 and Minn. R. 4410.4400 |
| The Permittee shall not emit thiourea. This is a state only requirement and is not enforceable by the EPA Administrator or citizens under the Clean Air Act. | Minn. R. 7007.0800, subp. 2 |
| The Permittee shall not emit methylene chloride. This is a state only requirement and is not enforceable by the EPA Administrator or citizens under the Clean Air Act. | Minn. R. 7007.0800, subp. 2 |
| The facility currently uses ozone-depleting substances as defined in 40 CFR pt. 82. Sections 601-618 of the 1990 Clean Air Act Amendments and 40 CFR pt. 82 may apply to your facility. Read Sections 601-618 and 40 CFR pt. 82 to determine all the requirements that apply to your facility. | 40 CFR pt. 82 |
| Potential to Emit from Insignificant Activities, Volatile Organic Compounds: less than or equal to 40 tons/year | Title I Condition: Limit to avoid classification as major source or modification under 40 CFR Section 52.21 and Minn. R. 7007.3000 |
| Insignificant Activity Evaluation: Prior to installing, changing, or modifying any Insignficant Activity, the Permittee shall update the Emissions Calculations - Insignificant Sources spreadsheet to show the revised combined PTE of all insignficant activitites. For VOC emissions, the total must be less than the Insignificant Activities limit given above. Any change or activity that would make the total greater than this number cannot be made without first applying for and obtaining a major permit amendment. | Title I Condition: Limit to avoid classification as major source or modification under 40 CFR Section 52.21 and Minn. R. 7007.3000 |
| OPERATIONAL REQUIREMENTS | hdr |
| Circumvention: Do not install or use a device or means that conceals or dilutes emissions, which would otherwise violate a federal or state air pollution control rule, without reducing the total amount of pollutant emitted. | Minn. R. 7011.0020 |
| Air Pollution Control Equipment: Operate all pollution control equipment whenever the corresponding process equipment and emission units are operated, unless otherwise noted in Table A. | Minn. R. 7007.0800, subp. 2; Minn. R. 7007.0800, subp. 16(J) |
| Operation and Maintenance Plan: Retain at the stationary source an operation and maintenance plan for all air pollution control equipment. At a minimum, the O & M plan shall identify all air pollution control equipment and shall include a preventative maintenance program for that equipment, a description of (the minimum but not necessarily the only) corrective actions to be taken to restore the equipment to proper operation to meet applicable permit conditions, a description of the employee training program for proper operation and maintenance of the control equipment, and the records kept to demonstrate plan implementation. | Minn. R. 7007.0800, subp. 14 and Minn. R. 7007.0800, subp. 16(J) |
| Operation Changes: In any shutdown, breakdown, or deviation the Permittee shall immediately take all practical steps to modify operations to reduce the emission of any regulated air pollutant. The Commissioner may require feasible and practical modifications in the operation to reduce emissions of air pollutants. No emissions units that have an unreasonable shutdown or breakdown frequency of process or control equipment shall be permitted to operate. | Minn. R. 7019.1000, subp. 4 |
| Fugitive Emissions: Do not cause or permit the handling, use, transporting, or storage of any material in a manner which may allow avoidable amounts of particulate matter to become airborne. Comply with all other requirements listed in Minn. R. 7011.0150. | Minn. R. 7011.0150 |

## TABLE A: LIMITS AND OTHER REQUIREMENTS

11/22/02

Facility Name: Northfield Acquisition Co - East & West

Permit Number: 13100005 - 001

| | |
|---|---|
| Noise: The Permittee shall comply with the noise standards set forth in Minn. R. 7030.0010 to 7030.0080 at all times during the operation of any emission units. This is a state only requirement and is not enforceable by the EPA Administrator or citizens under the Clean Air Act. | Minn. R. 7030.0010 - 7030.0080 |
| Inspections: The Permittee shall comply with the inspection procedures and requirements as found in Minn. R. 7007.0800, subp. 9(A). | Minn. R. 7007.0800, subp. 9(A) |
| The Permittee shall comply with the General Conditions listed in Minn. R. 7007.0800, subp. 16. | Minn. R. 7007.0800, subp. 16 |
| PERFORMANCE TESTING | hdr |
| Performance Testing: Conduct all performance tests in accordance with Minn. R. ch. 7017 unless otherwise noted in Tables A, B, and/or C. | Minn. R. ch. 7017 |
| Performance Test Notifications and Submittals:<br><br>Performance Tests are due as outlined in Tables A and B of the permit. See Table B for additional testing requirements.<br><br>Performance Test Notification (written): due 30 days before each Performance Test<br>Performance Test Plan: due 30 days before each Performance Test<br>Performance Test Pre-test Meeting: due 7 days before each Performance Test<br>Performance Test Report: due 45 days after each Performance Test<br>Performance Test Report - Microfiche Copy: due 105 days after each Performance Test<br><br>The Notification, Test Plan, and Microfiche Copy of the Test Report may be submitted in an alternative format as allowed by Minn. R. 7017.2018. | Minn. R. 7017.2030, subp. 1-4 and Minn. R. 7017.2035, subp. 1-2 |
| Limits set as a result of a performance test (conducted before or after permit issuance) apply until superseded as specified by Minn. R. 7017.2025 following formal review of a subsequent performance test on the same unit. | Minn. R. 7017.2025 |
| MONITORING REQUIREMENTS | hdr |
| Monitoring Equipment Calibration: Annually calibrate all required monitoring equipment (any requirements applying to continuous emission monitors are listed separately in this permit). | Minn. R. 7007.0800, subp. 4(D) |
| Operation of Monitoring Equipment: Unless otherwise noted in Tables A, B, and/or C, monitoring a process or control equipment connected to that process is not necessary during periods when the process is shutdown, or during checks of the monitoring systems, such as calibration checks and zero and span adjustments. If monitoring records are required, they should reflect any such periods of process shutdown or checks of the monitoring system. | Minn. R. 7007.0800, subp. 4(D) |
| RECORDKEEPING | hdr |
| Record keeping: Retain all records at the stationary source for a period of five (5) years from the date of monitoring, sample, measurement, or report. Records which must be retained at this location include all calibration and maintenance records, all original recordings for continuous monitoring instrumentation, and copies of all reports required by the permit. Records must conform to the requirements listed in Minn. R. 7007.0800, subp. 5(A). | Minn. R. 7007.0800, subp. 5(C) |
| Recordkeeping: Maintain records describing any insignificant modifications (as required by Minn. R. 7007. 1250, subp. 3) or changes contravening permit terms (as required by Minn. R. 7007.1350 subp. 2), including records of the emissions resulting from those changes. | Minn. R. 7007. 0800, subp. 5(B) |
| REPORTING/SUBMITTALS | hdr |
| Shutdown Notifications: Notify the Commissioner at least 24 hours in advance of a planned shutdown of any control equipment or process equipment if the shutdown would cause any increase in the emissions of any regulated air pollutant. If the owner or operator does not have advance knowledge of the shutdown, notification shall be made to the Commissioner as soon as possible after the shutdown. However, notification is not required in the circumstances outlined in Items A, B and C of Minn. R. 7019.1000, subp. 3.<br><br>At the time of notification, the owner or operator shall inform the Commissioner of the cause of the shutdown and the estimated duration. The owner or operator shall notify the Commissioner when the shutdown is over. | Minn. R. 7019.1000, subp. 3 |

## TABLE A: LIMITS AND OTHER REQUIREMENTS

11/22/02

Facility Name: Northfield Acquisition Co - East & West

Permit Number: 13100005 - 001

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|---|---|
| Breakdown Notifications: Notify the Commissioner within 24 hours of a breakdown of more than one hour duration of any control equipment or process equipment if the breakdown causes any increase in the emissions of any regulated air pollutant. The 24-hour time period starts when the breakdown was discovered or reasonably should have been discovered by the owner or operator. However, notification is not required in the circumstances outlined in Items A, B and C of Minn. R. 7019.1000, subp. 2.<br><br>At the time of notification or as soon as possible thereafter, the owner or operator shall inform the Commissioner of the cause of the breakdown and the estimated duration. The owner or operator shall notify the Commissioner when the breakdown is over. | Minn. R. 7019.1000, subp. 2 |
| Notification of Deviations Endangering Human Health or the Environment: As soon as possible after discovery, notify the Commissioner or the state duty officer, either orally or by facsimile, of any deviation from permit conditions which could endanger human health or the environment. | Minn. R. 7019.1000, subp. 1 |
| Notification of Deviations Endangering Human Health or the Environment Report: Within 2 working days of discovery, notify the Commissioner in writing of any deviation from permit conditions which could endanger human health or the environment. Include the following information in this written description:<br>1. the cause of the deviation;<br>2. the exact dates of the period of the deviation, if the deviation has been corrected;<br>3. whether or not the deviation has been corrected;<br>4. the anticipated time by which the deviation is expected to be corrected, if not yet corrected; and<br>5. steps taken or planned to reduce, eliminate, and prevent reoccurrence of the deviation. | Minn. R. 7019.1000, subp. 1 |
| Application for Permit Amendment: If a permit amendment is needed, submit an application in accordance with the requirements of Minn. R. 7007.1150 through Minn. R. 7007.1500. Submittal dates vary, depending on the type of amendment needed. | Minn. R. 7007.1150 through Minn. R. 7007.1500 |
| Extension Requests: The Permittee may apply for an Administrative Amendment to extend a deadline in a permit by no more than 120 days, provided the proposed deadline extension meets the requirements of Minn. R. 7007.1400, subp. 1(H). | Minn. R. 7007.1400, subp. 1(H) |
| Emission Inventory Report: due 91 days after end of each calendar year following permit issuance (April 1). To be submitted on a form approved by the Commissioner. | Minn. R. 7019.3000 through Minn. R. 7019.3010 |
| Emission Fees: due 60 days after receipt of an MPCA bill. | Minn. R. 7002.0005 through Minn. R. 7002.0095 |
| By May 15, 2004, submit to the MPCA a Part 2 MACT Hammer notification meeting the requirements of 40 CFR Section 63.53(b). | 40 CFR Section 63.52(e) |

## TABLE A: LIMITS AND OTHER REQUIREMENTS

11/22/02

Facility Name: Northfield Acquisition Co - East & West

Permit Number: 13100005 - 001

| What to do | Why to do it |
|---|---|
| GP 001 consists of the following emissions units: 001-003, 006, 008, 012, 014-018, 020-027, 031, 036, 038, 042-054, 057-062, 065-071, 074-085, 087-089, 091, 092, 098-105, 110, and 116-120.<br><br>Within GP 001, the following units are currently part of the Laminating Area: 015, 016, 017, 020, 023, 024, 025, 026, 027, 080, 081, 082, 083, 084, 087, 088, 089, 091, and 119.<br><br>Within GP 001, the following units are currently Wet Processes: 031, 036, 038, 042, 043, 044, 045, 046, 092, 098, 099, 100, 101, 102, and 120. | Associated Items |
| A. EMISSIONS AND OPERATING LIMITS | hdr |
| Volatile Organic Compounds: less than or equal to 205 tons/year using 12-month Rolling Sum to be calculated by the 15th day of each month for the previous 12-month period as described later in this permit.<br><br>All emission units as listed in GP 001 shall be included in this calculation. VOC contents for each VOC-containing material shall be determined as described under the Material Content requirement in GP 001. The calculation of VOCs used may take into account recovered/recycled VOCs as described under the Waste Credit requirement in GP 001. | Title I Condition: Limit to avoid classification as major source and modification under 40 CFR Section 52.21 and Minn. R. 7007.3000 |
| For the first 11 months after permit issuance, the VOC limit shall be as follows, calculated as a cumulative sum:<br><br>Month 1: 25 tons<br>Month 2: 40 tons<br>Month 3: 55 tons<br>Month 4: 70 tons<br>Month 5: 85 tons<br>Month 6: 100 tons<br>Month 7: 115 tons<br>Month 8: 130 tons<br>Month 9: 145 tons<br>Month 10: 160 tons<br>Month 11: 175 tons | Title I Condition: Limit to avoid classification as major source and modification under 40 CFR Section 52.21 and Minn. R. 7007.3000 |
| The Permittee is pre-authorized to make the following changes over the life of the permit:<br><br>1). Move or modify emissions units listed in GP 001; and<br>2). Replace emission units listed in GP 001 with similar units.<br><br>Provided the following conditions are met:<br>1). The proposed change does not trigger the requirements of 40 CFR pt. 63, subp. B (i.e., 112(g));<br>2). All replacement units have equal or lesser hourly potential emissions than those they are replacing;<br>3). VOC emissions are tracked and calculated as specified in this permit; and<br>4). All equipment meets the requirements for GP 001.<br><br>If a proposed change triggers an applicable requirement that is not contained in this permit, the change must be permitted using the appropriate procedure in Minn. R. ch. 7007. | Title I Condition: Limit to avoid classification as major source and modification under 40 CFR Section 52.21 and Minn. R. 7007.3000 |
| Total Particulate Matter: less than or equal to 0.3 grains/dry standard cubic foot of exhaust gas unless required to further reduce emissions to comply with the less stringent limit of either Minn. R. 7011.0730 or Minn. R. 7011. 0735. This applies separately to each piece of industrial process equipment in GP 001 that is not subject to a different Minn. R. ch. 7011 standard listed elsewhere in this permit. | Minn. R. 7011.0715, subp. 1(A) |
| Opacity: less than or equal to 20 percent opacity . This applies separately to each piece of industrial process equipment in GP 001 that is not subject to a different Minn. R. ch. 7011 standard listed elsewhere in this permit. | Minn. R. 7011.0715, subp. 1(B) |
| B. MONITORING AND RECORDKEEPING | hdr |
| Recordkeeping of Changes: Prior to making any pre-authorized change, the Permittee shall document that the proposed change meets the criteria listed in this permit and is therefore pre-authorized. The Permittee shall maintain this documentation on site.<br><br>For modified and replacement units, the Permittee shall update the necessary MPCA permit application forms (e.g., GI-05B) with the necessary revisions (e.g., manufacturer, date of installation/modification, capacity, etc.). In addition, the Permittee shall also maintain a listing of which emissions units are Laminating and Wet Processes. The Permittee shall maintain this documentation on site and include it in the Annual Report listed in Table B of this permit. | Minn. R. 7007.0800, subp. 4 and 5 |

Facility Name: Northfield Acquisition Co - East & West

Permit Number: 13100005 - 001

| | |
|---|---|
| Material Usage Recordkeeping<br><br>1). Laminating: On each operating day, the Permittee shall record and maintain the quantity of each material mixed, based on mixing, dispensing, or usage logs. For cleaners and thinners that are not mixed, on each operating day, the Permittee shall record and maintain the quantity of each material dispensed. The records shall include the material specification number and the mass or volume of material.<br><br>2). Wet Processes: Each time a container of VOC-containing materials is taken out of chemical storage, the Permittee shall record the size (mass or volume) of the container and the product name or number.<br><br>3). For all other VOC-containing materials: The Permittee shall calculate, record, and maintain monthly usage records showing the quantity of each material used. This shall be based on written usage or dispensing logs, or purchase/delivery records. The record shall include the material specification number and the mass or volume of material. | Title I Condition: Monitoring for Limit to avoid classification as major source and modification under 40 CFR Section 52.21 and Minn. R. 7007.3000; Minn. R. 7007.0800. subp. 4 and 5 |
| Fuel Records.<br><br>1). The Permittee shall keep records of fuel purchases for the Facility on a monthly basis.<br><br>2). The Permittee shall obtain and maintain a certification from the fuel supplier for each No. 2 Fuel Oil delivery specifying the sulfur content of the fuel oil, in weight percent. | Minn. R. 7007.0800, subp. 5 |
| Records of Materials Mixed for Off-site Use: On a monthly basis the Permittee shall document and record each material processed in the mixing room for off-site use. The record shall include the specification number and quantity (either mass or volume). This shall be completed by the 10th day of each calendar month for the previous calendar month. | Minn. R. 7007.0800, subp. 4 and 5 |
| Material Specifications: For each VOC-containing material purchased for use on-site or VOC-containing material mixed on-site, the Permittee shall document and record the maximum VOC content as well as any other data needed to convert the usage records into a weight value in "tons" (e.g., density in lb/gal). This record shall be updated prior to beginning use of any new material. | Minn. R. 7007.0800, subp. 4 and 5 |
| Monthly Recordkeeping -- VOC Emissions.<br>By the 15th of the month, the Permittee shall calculate and record the following:<br>1) The total usage of VOC containing materials for the previous calendar month using the usage records. This record shall also include the VOC contents of each material as determined by the Material Content requirement of this permit.<br>2) The VOC emissions for the previous month using the formulas specified in Appendix I of this permit.<br>3) The 12-month rolling sum VOC emissions for the previous 12-month period by summing the monthly VOC emissions data for the previous 12 months. | Minn. R. 7007.0800, subp. 4 and 5 |
| Material Content: The VOC content of materials shall be determined by the Material Safety Data Sheet (MSDS) provided by the supplier for each material used. If a material content range is given on the MSDS, the highest number in the range shall be used in all permit calculations. Other alternative methods approved by the MPCA may be used to determine the VOC contents. The Commissioner reserves the right to require the Permittee to determine the VOC contents of any material, according to EPA or ASTM reference methods. If an EPA or ASTM reference method is used for material content determination, the data obtained shall supersede the MSDS. | Minn. R. 7007.0800, subp. 4 and 5 |
| Waste Credit: If the Permittee elects to obtain credit for VOC shipped in waste materials, the Permittee shall use either Option 1 or 2 to determine the VOC content for each credited shipment.<br><br>Option 1: The Permittee shall analyze a composite sample of each waste shipment to determine the weight content of VOC.<br><br>Option 2: The Permittee may use supplier data for raw materials to determine the VOC contents of each waste shipment, using the same content data used to determine the content of raw materials. If the waste contains several materials, the content of mixed waste shall be assumed to be the lowest VOC content of any of the materials. | Minn. R. 7007.0800, subp. 4 and 5 |
| Mix Room Emission Factor Study: The Permittee may conduct an engineering study using a mass balance approach to develop an emissions factor, or multiple emissions factors as needed, for the mix room. The Permittee shall submit the study results and proposed emission factor(s) to the MPCA for review and approval. Once the emissions factor(s) are approved in writing by the MPCA, they shall be used in the calculations detailed in Appendix I of this permit. | Minn. R. 7007.0800, subp. 2, 4 and 5 |

Facility Name: Northfield Acquisition Co - East & West

Permit Number: 13100005 - 001

| | |
|---|---|
| Ethanolamine Emission Factor Study: The Permittee may conduct an engineering study using a mass balance approach to develop an emissions factor for this compound. The Permittee shall submit the study results and proposed emission factor to the MPCA for review and approval. Once the emissions factor is approved in writing by the MPCA, it may be used in the calculations detailed in Appendix I of this permit. | Minn. R. 7007.0800, subp. 2, 4 and 5 |

## TABLE A: LIMITS AND OTHER REQUIREMENTS

11/22/02

Facility Name: Northfield Acquisition Co - East & West

Permit Number: 13100005 - 001

| What to do | Why to do it |
|---|---|
| Total Particulate Matter: less than or equal to 0.6 lbs/million Btu heat input . This applies separately to each indirect heating unit in GP 002. The potential to emit is 0.0076 lb/MMBtu based on allowable fuels. | Minn. R. 7011.0510, subp. 1 |
| Opacity: less than or equal to 20 percent opacity except for one six-minute period per hour of not more than 60 percent opacity. This applies separately to each indirect heating unit in GP 002. | Minn. R. 7011.0510, subp. 2 |
| Fuel Type: natural gas or propane only, by design. | Minn. R. 7005.0100, subp. 35a |

## TABLE A: LIMITS AND OTHER REQUIREMENTS

11/22/02

Facility Name: Northfield Acquisition Co - East & West

Permit Number: 13100005 - 001

| What to do | Why to do it |
|---|---|
| Total Particulate Matter: less than or equal to 0.4 lbs/million Btu heat input . This applies separately to each indirect heating unit in GP 003. The maximum potential to emit is 0.014 lb/MMBtu based on allowable fuels. | Minn. R. 7011.0515, subp. 1 |
| Opacity: less than or equal to 20 percent opacity except for one six-minute period per hour of not more than 60 percent opacity. This applies separately to each indirect heating unit in GP 003. | Minn. R. 7011.0515, subp. 2 |
| Fuel Type: Natural Gas, Propane, or No. 2 Fuel Oil only, by design. | Minn. R. 7005.0100, subp. 35a |
| No. 2 Fuel Oil, Sulfur Content: less than or equal to 0.5% by weight. | Minn. R. 7007.0800, subp. 2 |

## TABLE A: LIMITS AND OTHER REQUIREMENTS

11/22/02

Facility Name: Northfield Acquisition Co - East & West

Permit Number: 13100005 - 001

| What to do | Why to do it |
|---|---|
| Opacity: less than or equal to 20 percent opacity once operating temperatures have been attained. This applies separately to each generator in GP 004. | Minn. R. 7011.2300, subp. 1 |
| Sulfur Dioxide: less than or equal to 0.5 lbs/million Btu heat input . This applies separately to each generator in GP 004. The potential to emit is 0.0006 lb/MMBtu based on allowable fuels. | Minn. R. 7011.2300, subp. 2 |
| Fuel Type: natural gas only, by design. | Minn. R. 7005.0100, subp. 35a |
| Recordkeeping -- Hours of Operation: The Permittee shall maintain documentation on-site that each unit in GP 004 is an emergency generator by design that qualifies under the U.S. EPA memorandum entitled "Calculating Potential to Emit (PTE) for Emergency Generators" dated September 6, 1995, limiting operation to 500 hours per year. | Minn. R. 7007.0800, subp. 4 and 5 |

## TABLE A: LIMITS AND OTHER REQUIREMENTS

11/22/02

Facility Name: Northfield Acquisition Co - East & West

Permit Number: 13100005 - 001

**Subject Item: EU 003 Boiler F-1060-23**

| What to do | Why to do it |
|---|---|
| Total Particulate Matter: less than or equal to 0.4 lbs/million Btu heat input . The potential to emit is 0.0076 lb/MMBtu based on allowable fuels. | Minn. R. 7011.0515, subp. 1 |
| Opacity: less than or equal to 20 percent opacity except for one six-minute period per hour of not more than 60 percent opacity. | Minn. R. 7011.0515, subp. 2 |
| Fuel Type: natural gas or propane only, by design. | Minn. R. 7005.0100, subp. 35a |

## TABLE A: LIMITS AND OTHER REQUIREMENTS

11/22/02

Facility Name: Northfield Acquisition Co - East & West

Permit Number: 13100005 - 001

**Subject Item: EU 012 Oxidizer Burner**

| What to do | Why to do it |
|---|---|
| Total Particulate Matter: less than or equal to 0.3 grains/dry standard cubic foot of exhaust gas unless required to further reduce emissions to comply with the less stringent limit of either Minn. R. 7011.0730 or Minn. R. 7011.0735. | Minn. R. 7011.0610, subp. 1(A)(1) |
| Opacity: less than or equal to 20 percent opacity except for one six-minute period per hour of not more than 60 percent opacity. | Minn. R. 7011.0610, subp. 1(A)(2) |
| Fuel Type: natural gas or propane only, by design. | Minn. R. 7005.0100, subp. 35a |

## TABLE A: LIMITS AND OTHER REQUIREMENTS

11/22/02

Facility Name: Northfield Acquisition Co - East & West

Permit Number: 13100005 - 001

**Subject Item:** **CE 002 Catalytic Afterburner w/Heat Exchanger**

**Associated Items:** EU 010 Surface Coating

| What to do | Why to do it |
|---|---|
| A. MONITORING SCENARIOS | hdr |
| Monitoring Scenarios: The Permittee is authorized to install a new temperature monitoring system that will monitor the 3-hour rolling average inlet temperature of the catalytic oxidizer. Prior to installation of such a system, the Permittee shall comply with and monitor for the absolute minimum temperature limit listed under Scenario 1. After installation of the system, the Permittee shall comply with and monitor for the 3-hour rolling average temperature limit under Scenario 2. | Minn. R. 7007.0800, subp. 11 |
| Notify: due 30 days after Equipment Installation. The Permittee shall notify the MPCA when the installation of the new temperature monitoring system is complete. The notification shall include the date that the Permittee switched to Monitoring Scenarion 2. | Minn. R. 7007.0800, subp. 11 |
| B. LIMITS APPLICABLE UNDER BOTH SCENARIOS | hdr |
| The Permittee shall operate and maintain the control equipment such that it achieves a destruction efficiency for Volatile Organic Compounds: greater than or equal to 92 percent destruction efficiency | Title I Condition: Limit taken to avoid classification as a major source and modification under 40 CFR Section 52.21 and Minn. R. 7007.3000 |
| The Permittee shall operate and maintain the catalytic oxidizer any time that any one of following units is in operation and using VOC-containing materials: EUs 025, 080, 081, 082, 083, and 084 (Laminators).<br><br>The Permittee has the option of controlling the following emissions points: EUs 015, 023, 026, and 027 (Slot or Enclosure Exhaust). | Title I Condition: Limit taken to avoid classification as a major source and modification under 40 CFR Section 52.21 and Minn. R. 7007.3000 |
| C. SCENARIO 1 | hdr |
| Temperature: greater than or equal to 645 degrees F absolute minimum at the inlet until a new minimum is set pursuant to Minn. R. 7017.2025, subp. 3, based on the average temperature recorded during the most recent MPCA approved performance test where compliance for VOC emissions was demonstrated. If the inlet temperature drops below the minimum temperature limit, the VOC used during that time shall be considered uncontrolled until the minimum temperature limit is once again achieved. This shall be reported as a deviation. | Title I Condition: Limit taken to avoid classification as a major source and modification under 40 CFR Section 52.21 and Minn. R. 7007.3000 |
| D. SCENARIO 2 | hdr |
| Temperature: greater than or equal to 645 degrees F as a 3-hour rolling average at the inlet until a new minimum is set pursuant to Minn. R. 7017.2025, subp. 3, based on the average temperature recorded during the most recent MPCA approved performance test where compliance for VOC emissions was demonstrated. If the 3-hour rolling average inlet temperature drops below the minimum temperature limit, the VOC used during that time shall be considered uncontrolled until the average minimum temperature limit is once again achieved. This shall be reported as a deviation. | Title I Condition: Limit taken to avoid classification as a major source and modification under 40 CFR Section 52.21 and Minn. R. 7007.3000 |
| E. MONITORING | hdr |
| Monitoring Equipment: The Permittee shall install and maintain thermocouples for measuring the temperatures as required by this permit. The monitoring equipment must be installed, in use, and properly maintained whenever the monitored control equipment is required to be operated. | Minn. R. 7007.0800, subp. 4 |
| The Permittee shall maintain and operate a thermocouple monitoring device that continuously indicates and records both the inlet and outlet temperatures of the catalytic oxidizer. The monitoring device shall have a margin of error less than the greater of +/- 0.75 percent of the temperature being measured or +/- 2.5 degrees Celsius. Once operating under Scenario 2, the recording device shall also calculate the three-hour rolling average inlet temperature. | Minn. R. 7007.0800, subp. 4 and 5 |
| The Permittee shall maintain a continuous hard copy readout or computer disk file of the inlet and outlet temperatures. Once operating under Scenario 2, the Permittee shall also maintain the calculated three-hour rolling average inlet temperature. | Title I Condition: Monitoring for Limit taken to avoid classification as a major source and modification under 40 CFR Section 52.21 and Minn. R. 7007.3000; Minn. R. 7007.0800, subp. 4 and 5 |
| Daily Monitoring: The Permittee shall physically check the temperature recording device at least once each operating day to verify that it is working and recording properly. | Minn. R. 7007.0800, subp. 4 and 5 |
| Sample Analysis: due before end of each calendar 24 months following Permit Issuance. The Permittee shall send a representative sample of the catalyst to a laboratory to test the catalyst's destruction efficiency. If test results show a destruction efficiency of less than 92%, the Permittee shall follow the corrective actions contained in the Operation and Maintenance Plan. | Minn. R. 7007.0800, subp. 4, 5, and 14 |

## TABLE A: LIMITS AND OTHER REQUIREMENTS

11/22/02

Facility Name: Northfield Acquisition Co - East & West

Permit Number: 13100005 - 001

| | |
|---|---|
| Quarterly Inspections: At least once per calendar quarter, or more frequently if required by the manufacturer specifications, the Permittee shall inspect the control equipment external system components. The Permittee shall maintain a written record of the inspection and any corrective actions taken resulting from the inspection. | Minn. R. 7007.0800, subp. 4, 5, and 14 |
| Annual Inspections: At least once per calendar year, or more frequently if required by the manufacturer specifications, the Permittee shall inspect the control equipment internal system components, including but not limited to the refractory, heat exchanger, and electrical systems. The Permittee shall maintain a written record of the inspection and any corrective actions taken resulting from the inspection. | Minn. R. 7007.0800, subp. 4, 5, and 14 |
| Annual Calibration: The Permittee shall calibrate the temperature monitor at least annually and shall maintain a written record of the calibration and any action resulting from the calibration. | Minn. R. 7007.0800, subp. 4, 5, and 14 |
| For periods when the catalytic oxidizer is operated above the minimum inlet temperature, the Permittee shall use either one of the following when completing calculations as required elsewhere in this permit:<br>a. The destruction efficiency specified in this permit (92%); or<br>b. The destruction and/or overall control efficiency determined during the most recent MPCA approved performance test. If the tested efficiency is less than the efficiency limit in this permit, the Permittee must use the tested value in all calculations until the efficiency is demonstrated to be above the permit limit through a new test. | Title I Condition: Limit taken to avoid classification as a major source and modification under 40 CFR Section 52.21 and Minn. R. 7007.3000; Minn. R. 7007.0800, subp. 4 and 5 |
| The Permittee shall keep records at each Laminator documenting when non-VOC-containing materials are being used (and therefore control is not required). In the absense of such a record, it will be assumed that VOC-containing materials were in use.<br><br>The Permittee shall keep a log of times and materials used when the Slot or Enclosure Exhausts are vented to CE 002. | Title I Condition: Limit taken to avoid classification as a major source and modification under 40 CFR Section 52.21 and Minn. R. 7007.3000 |
| Corrective Actions: If the temperature is below the minimum specified by this permit or if the catalytic oxidizer or any of its components are found during the inspections to need repair, the Permittee shall take corrective action as soon as possible. Corrective actions shall return the temperature to at least the permitted minimum and/or include completion of necessary repairs identified during the inspection, as applicable. Corrective actions include, but are not limited to, those outlined in the O & M Plan for the catalytic oxidizer. The Permittee shall keep a record of the type and date of any corrective action taken. | Minn. R. 7007.0800, subp. 4, 5, and 14 |
| The Permittee shall operate and maintain the thermal oxidizer in accordance with the Operation and Maintenance (O & M) Plan. The Permittee shall keep copies of the O & M Plan available onsite for use by staff and MPCA staff. | Minn. R. 7007.0800, subp. 14 |
| Hood Certification and Evaluation: If the Permittee wishes to obtain credit for controlling any slot exhaust or enclosure (EUs 015, 023, 026, and 027), the Permittee must satisfy this requirement for each unit where credit is taken.<br><br>The ventilation hood must conform to the requirements listed in Minn. R. 7011.0070, subp. 1, and the Permittee shall certify this as specified in Minn. R. 7011.0070, subp. 3. The Permittee shall maintain a copy of the certification on site, as well as an annual record of fan rotation speed, fan power draw, or face velocity of each hood, or other comparable air flow indication method. If these requirements are satisifed, the Permittee can assume a 60% capture efficiency for these units in the calculations in Appendix I of this permit. | Minn. R. 7007.0800, subp. 4 and 14 |
| Performance Test: due 180 days after Permit Issuance for VOC Destruction Efficiency of the Catalytic Oxidizer. In addition, the test shall measure the carryover of VOC emissions into the dryer versus emitted from the slot/enclosure exhaust (currently assumed to be 93% and 7%). | Minn. R. 7017.2020, subp. 1 |

## TABLE A: LIMITS AND OTHER REQUIREMENTS

11/22/02

Facility Name: Northfield Acquisition Co - East & West

Permit Number: 13100005 - 001

| What to do | Why to do it |
|---|---|
| Ammonia: less than or equal to 6.2 lb/hr, based on a three-hour average. This is a state only requirement and is not enforceable by the EPA Administrator or citizens under the Clean Air Act. | Minn. R. 7007.0800, subp. 2 |
| The Permittee shall operate and maintain the control equipment such that it acheives an overall control efficiency for Ammonia: greater than or equal to 85% control efficiency. | Minn. R. 7007.0800, subp. 2 |
| Pressure Drop: less than or equal to 6.0 inches of water column , unless a new limit is set pursuant to Minn. R. 7017.2025, subp. 3, based on the value recorded during the most recent MPCA approved performance test where compliance was demonstrated. The Permittee shall record the pressure drop once every 24 hours when in operation. | Minn. R. 7007.0800, subp. 2 and 14 |
| pH: less than or equal to 3.5, unless a new limit is set pursuant to Minn. R. 7017.2025, subp. 3, based on the value recorded during the most recent MPCA approved performance test where compliance was demonstrated. The Permittee shall record the pH once every 24 hours when in operation. | Minn. R. 7007.0800, subp. 2 and 14 |
| The Permittee shall operate and maintain the wet scrubber any time that any emission unit controlled by the wet scrubber is in operation. | Minn. R. 7007.0800, subp. 2 and 14 |
| Recordkeeping of Pressure Drop and pH. The Permittee shall record the time and date of each pressure drop and pH reading and whether or not the recorded value was under the limit specified in this permit. | Minn. R. 7007.0800, subp. 4, 5, and 14 |
| Corrective Actions: The Permittee shall take corrective action as soon as possible if any of the following occur:<br>- the recorded pH is greater than the listed limit;<br>- the recorded pressure drop is greater than the listed limit; or<br>- the scrubber or any of its components are found during the inspections to need repair.<br>Corrective actions shall return the values to below the listed permit limits and/or include completion of necessary repairs identified during the inspection, as applicable. Corrective actions include, but are not limited to, those outlined in the O & M Plan for the scrubber. The Permittee shall keep a record of the type and date of any corrective action taken for the scrubber. | Minn. R. 7007.0800, subp. 4, 5, and 14 |
| Monitoring Equipment: The Permittee shall install and maintain the necessary monitoring equipment for measuring and recording the pressure drop and pH as required by this permit. The monitoring equipment must be installed, in use, and properly maintained when the monitored scrubber is in operation. | Minn. R. 7007.0800, subp. 4 |
| Periodic Inspections: At least once per calendar quarter, or more frequently as required by the manufacturing specifications, the Permittee shall inspect the control equipment components. The Permittee shall maintain a written record of these inspections. | Minn. R. 7007.0800, subp. 4, 5, and 14 |
| The Permittee shall operate and maintain the wet scrubber in accordance with the Operation and Maintenance (O & M) Plan. The Permittee shall keep copies of the O & M Plan available onsite for use by staff and MPCA staff. | Minn. R. 7007.0800, subp. 14 |

## TABLE A: LIMITS AND OTHER REQUIREMENTS

11/22/02

Facility Name: Northfield Acquisition Co - East & West

Permit Number: 13100005 - 001

| What to do | Why to do it |
|---|---|
| Ammonia: less than or equal to 0.56 lb/hr, based on a three-hour average. This is a state only requirement and is not enforceable by the EPA Administrator or citizens under the Clean Air Act. | Minn. R. 7007.0800, subp. 2 |
| The Permittee shall operate and maintain the control equipment such that it acheives an overall control efficiency for Ammonia: greater than or equal to 85% control efficiency. | Minn. R. 7007.0800, subp. 2 |
| Pressure Drop: less than or equal to 6.0 inches of water column , unless a new limit is set pursuant to Minn. R. 7017.2025, subp. 3, based on the value recorded during the most recent MPCA approved performance test where compliance was demonstrated. The Permittee shall record the pressure drop once every 24 hours when in operation. | Minn. R. 7007.0800, subp. 2 and 14 |
| pH: less than or equal to 3.5, unless a new limit is set pursuant to Minn. R. 7017.2025, subp. 3, based on the value recorded during the most recent MPCA approved performance test where compliance was demonstrated. The Permittee shall record the pH once every 24 hours when in operation. | Minn. R. 7007.0800, subp. 2 and 14 |
| The Permittee shall operate and maintain the wet scrubber any time that any emission unit controlled by the wet scrubber is in operation. | Minn. R. 7007.0800, subp. 2 and 14 |
| Recordkeeping of Pressure Drop and pH. The Permittee shall record the time and date of each pressure drop and pH reading and whether or not the recorded value was under the limit specified in this permit. | Minn. R. 7007.0800, subp. 4, 5, and 14 |
| Corrective Actions: The Permittee shall take corrective action as soon as possible if any of the following occur:<br>- the recorded pH is greater than the listed limit;<br>- the recorded pressure drop is greater than the listed limit; or<br>- the scrubber or any of its components are found during the inspections to need repair.<br>Corrective actions shall return the values to below the listed permit limits and/or include completion of necessary repairs identified during the inspection, as applicable. Corrective actions include, but are not limited to, those outlined in the O & M Plan for the scrubber. The Permittee shall keep a record of the type and date of any corrective action taken for the scrubber. | Minn. R. 7007.0800, subp. 4, 5, and 14 |
| Monitoring Equipment: The Permittee shall install and maintain the necessary monitoring equipment for measuring and recording the pressure drop and pH as required by this permit. The monitoring equipment must be installed, in use, and properly maintained when the monitored scrubber is in operation. | Minn. R. 7007.0800, subp. 4 |
| Periodic Inspections: At least once per calendar quarter, or more frequently as required by the manufacturing specifications, the Permittee shall inspect the control equipment components. The Permittee shall maintain a written record of these inspections. | Minn. R. 7007.0800, subp. 4, 5, and 14 |
| The Permittee shall operate and maintain the wet scrubber in accordance with the Operation and Maintenance (O & M) Plan. The Permittee shall keep copies of the O & M Plan available onsite for use by staff and MPCA staff. | Minn. R. 7007.0800, subp. 14 |

## TABLE B: SUBMITTALS

11/22/02

Facility Name: Northfield Acquisition Co - East & West

Permit Number: 13100005 - 001

**Table B lists most of the submittals required by this permit. Please note that some submittal requirements may appear in Table A or, if applicable, within a compliance schedule located in Table C. Table B is divided into two sections in order to separately list one-time only and recurrent submittal requirements.**

**Each submittal must be postmarked or received by the date specified in the applicable Table. Those submittals required by parts 7007.0100 to 7007.1850 must be certified by a responsible official, defined in Minn. R. 7007.0100, subp. 21. Other submittals shall be certified as appropriate if certification is required by an applicable rule or permit condition.**

**Send any application for a permit or permit amendment to:**

**Permit Technical Advisor**
**Permit Section**
**Air Quality Division**
**Minnesota Pollution Control Agency**
**520 Lafayette Road North**
**St. Paul, Minnesota 55155-4194**

**Also, where required by an applicable rule or permit condition, send to the Permit Technical Advisor notices of:**
**- accumulated insignificant activities,**
**- installation of control equipment,**
**- replacement of an emissions unit, and**
**- changes that contravene a permit term.**

**Unless another person is identified in the applicable Table, send all other submittals to:**

**Supervisor**
**Compliance Determination Unit**
**Air Quality Division**
**Minnesota Pollution Control Agency**
**520 Lafayette Road North**
**St. Paul, Minnesota 55155-4194**

**Send submittals that are required to be submitted to the U.S. EPA regional office to:**

**Mr. George Czerniak**
**Air and Radiation Branch**
**EPA Region V**
**77 West Jackson Boulevard**
**Chicago, Illinois 60604**

**Send submittals that are required by the Acid Rain Program to:**

**U.S. Environmental Protection Agency**
**Clean Air Markets Division**
**1200 Pennsylvania Avenue NW (6204N)**
**Washington, D.C. 20460**

## TABLE B: ONE TIME SUBMITTALS OR NOTIFICATIONS

11/22/02

Facility Name: Northfield Acquisition Co - East & West

Permit Number: 13100005 - 001

| What to send | When to send | Portion of Facility Affected |
|---|---|---|
| Application for Permit Reissuance | due 180 days before expiration of Existing Permit | Total Facility |
| Testing Frequency Plan | due 60 days after Initial Performance Test for VOC Destruction Efficiency and VOC carryover. The plan shall specify a testing frequency based on the test data and MPCA guidance. Future performance tests based on one-year (12 month), 36 month, and 60 month intervals, or as applicable, shall be required upon written approval of the MPCA. | CE002 |

## TABLE B: RECURRENT SUBMITTALS

11/22/02

Facility Name: Northfield Acquisition Co - East & West

Permit Number: 13100005 - 001

| What to send | When to send | Portion of Facility Affected |
|---|---|---|
| Semiannual Deviations Report | due 30 days after end of each calendar half-year following Permit Issuance. The first semiannual report submitted by the Permittee shall cover the calendar half-year in which the permit is issued. The first report of each calendar year covers January 1 - June 30. The second report of each calendar year covers July 1 - December 31. If no deviations have occured, the Permittee shall submit the report stating no deviations. | Total Facility |
| Annual Report | due 31 days after end of each calendar year following Permit Issuance. The Permittee shall submit an annual report by January 31 that describes the changes made at the facility during the previous calendar year using the latest MPCA application forms. The report shall include the VOC 12-month rolling sum calculations for the previous calendar year. The report shall be submitted with the annual Compliance Certification listed in Table B. As part of the Annual Report, the Permittee shall verify and certify that the facility has maintained minor source status for New Source Review. | Total Facility |
| Compliance Certification | due 31 days after end of each calendar year following Permit Issuance (for the previous calendar year). To be submitted on a form approved by the Commissioner, both to the Commissioner and to the US EPA regional office in Chicago. This report covers all deviations experienced during the calendar year. | Total Facility |

**APPENDIX I**
**Facility Name: Northfield Acquisition Co.**
**Permit Number: 13100005-001**

## VOC Calculation Procedures

The Permittee shall calculate monthly VOC emissions using the formulas below. If the Permittee tracks material usage on a volume basis, the Permittee shall also record the necessary material density or VOC content in pounds/gallon, and perform the necessary conversions to calculate emissions in tons/month.

VOC (tons) = A + B + C + D + F – G

A = VOC emissions, in tons, from laminating mixing area (EUs 016, 017, 020, 024, 087, 088, 089, 091, and 119)
A = [(MF1 x U1 x V1) + (MF2 x U2 x V2) + …..]/2000

MF# = the appropriate Total Mixing Emissions Factor for a given material, based on the number of times the given material is mixed or weighed. This shall be based on the specific factors of 0.10 lb/lb for open mixing, 0.06 lb/lb for closed mixing, and 0.92 lb/ton for product weighing unless the MPCA approves new mixing factors per the procedures in Table A of this permit.

U# = amount of each VOC-containing material mixed the previous month, in pounds (or tons for product weighing at EU 016)

V# = weight percent VOC in U#, as a fraction (e.g., 10 % is 0.10)

B = VOC emissions, in tons, from the laminator slots or enclosures (EUs 026, 015, 023, and 027)
B = [(1-MF1) x (S1 x (U1 x V1) x (1 - (CE x DE))) + (1-MF2) x (S2 x (U2 x V2) x (1 - (CE x DE)) + …..]/2000

S# = the percentage of the material emitted at the given slot or enclosure. This is 0.07 (7%) for all units until new values are set per MPCA-approved testing.

MF# = For any material that was mixed and where the mixing emissions were already calculated under item “A”, this is the same mixing factor from above (e.g., 0.10 lb/lb for open mixing). If the material was not mixed (e.g., cleaner), MF# = 0.

U# = amount of each VOC-containing material used at the laminators in the previous month, in pounds.

V# = weight percent VOC in U#, as a fraction

For times when the emissions are controlled (per the requirements in Table A of this permit):

CE = capture efficiency for the specific slot or enclosure, as determined through an MPCA-approved performance test or as specified in Table A of this permit.

DE = destruction efficiency of the applicable control system

If the emissions are not vented to the control device, CE and DE = 0

C = VOC emissions, in tons, from the laminator dryers (EUs 025, 080, 081, 082, 083, and 084)
C = [(1-MF1) x (T1 x (U1 x V1) x (1 - OCE)) + (1-MF2) x (T2 x (U2 x V2) x (1 - OCE)) + …..]/2000

T# = the percentage of the material emitted into the tunnel dryers (vs. the slot or enclosure). For EUs 025, 082, 083, and 084, this is 0.93 (or 93%) until new values are set per MPCA-approved testing. For EUs 080 and 081, this is 1.0.
MF# = For any material that was mixed and where the mixing emissions were already calculated under item "A", this is the same mixing factor from above (e.g., 0.10 lb/lb for open mixing). If the material was not mixed (e.g., cleaner), MF# = 0.
U# = amount of each VOC-material used at the laminators in the previous month, in pounds
V# = weight percent VOC in U#, as a fraction
OCE = overall control efficiency of the control system, assuming a capture efficiency of 100%.

D = VOC emissions, in tons, from all other processes
D = [(EF1 x U1 x V1) + (EF2 x U2 x V2) + ….]/2000

EF# = emissions factor for the given process. EF is assumed to be "1" (or 100% emitted) for each VOC-containing material unless a new value is approved by the MPCA per the procedures detailed in Table A of this permit.
U# = amount of each VOC-containing material used in the previous month, in pounds
V# = weight percent VOC in U#, as a fraction

F = VOC emissions, in tons, from combustion of fuel.
F = (NG x $EF_{gas}$) + (FO x $EF_{fo}$)

NG = amount of natural gas burned in the previous month.
$EF_{gas}$ = emissions factor for natural gas combustion, from most recent edition of EPA's AP-42.
FO = amount of No. 2 fuel oil burned in the previous month.
$EF_{fo}$ = emissions factor for No. 2 fuel oil combustion, from most recent edition of EPA's AP-42.
If the Permittee doesn't wish to calculate the actual VOC emissions from fuel combustion, the Permittee shall use the total calculated VOC PTE from all significant combustion units for "F". At the time of permit issuance, this is 1.25 tpy.

G = the amount of VOC shipped in waste, in tons
G = [(W1 x V1) + (W2 x V2) + …..]/2000

W# = amount, in pounds, of each VOC-containing waste shipped in the previous month. If the Permittee chooses to not take credit for waste shipments, this parameter would be zero.
V# = weight percent VOC in W#, as a fraction

Waste may be credited at the individual variable level (e.g., A, B, C, etc.) or as a separate variable, G.

**APPENDIX II**
**Facility Name: Northfield Acquisition Co.**
**Permit Number: 13100005-001**

# Insignificant Activities and General Applicable Requirements

The table below lists the insignificant activities that are currently at the facility and their associated general applicable requirements.

| Minn. R. 7007.1300, subp. | Rule Description of the Activity | General Applicable Requirement |
|---|---|---|
| 3(B)(1) | infrared electric ovens | Minn. R. 7011.0110 (opacity) |
| 3(G) | laboratory equipment | Minn. R. 7011.0715 (PM and opacity) |
| 3(H)(4) | brazing, soldering or welding equipment | Minn. R. 7011.0715 (PM and opacity) |
| 3(I) | Individual emissions units at a stationary source, each of which have a potential to emit the following pollutants in amounts less than:<br>1. 4,000 lbs/year of carbon monoxide; and<br>2. 2,000 lbs/year each of nitrogen oxide, sulfur dioxide, particulate matter, particulate matter less than ten microns, volatile organic compounds (including hazardous air pollutant-containing VOC), and ozone.<br>*Sheldahl has approximately 25 units that qualify under this subpart.* | Minn. R. 7011.0715 (PM and opacity) |
| 4 | Individual emissions units with actual emissions of one ton per year or less for particulate matter, particulate matter less than ten microns, nitrogen oxide, sulfur dioxide, and VOCs, and emissions of HAP under various thresholds listed in the rule.<br>*Sheldahl has approximately 45 units that qualify under this subpart.* | various |

**APPENDIX III**
**Facility Name: Northfield Acquisition Co.**
**Permit Number: 13100005-001**

# Facility Description from Delta

*(paper copy only)*

**TECHNICAL SUPPORT DOCUMENT**
**For**
**AIR EMISSION PERMIT NO. 13100005-001**

This technical support document is for all the interested parties of the permit. The purpose of this document is to set forth the legal and factual basis for the permit conditions, including references to the applicable statutory or regulatory provisions.

## 1. General Information

### 1.1. Applicant and Stationary Source Location:

| Facility Address and Contact Information<br>(SIC Code: 3679) |
|---|
| Northfield Acquisition Co.<br>(previously Sheldahl, Inc.)<br>1150 Sheldahl Rd and 805 North Highway 3<br>Northfield, MN<br>Rice and Dakota Counties<br>Dan Hon, 507-663-8284 |

### 1.2. Description of the Facility

The Permittee owns and operates a flexible printed circuit fabrication facility and manufactures specialty electronic products such as flexible printed circuitry, flexible composite laminates, and specialty engineering products. The stationary source consists of two buildings on either side of a county road called the East and West facilities. They are considered one stationary source under all air regulations. The types of emissions units include mixing, laminating, screen printing, plating, etching, stripping, material handling, and combustion of natural gas, propane, and no. 2 fuel oil.

The main emissions are volatile organic compounds (VOC) and hazardous air pollutants (HAP), with lesser amounts of particulate matter and particulate matter less than 10 microns ($PM/PM_{10}$) and various other pollutants from the combustion of natural gas, propane, and no. 2 fuel oil. The Facility currently has two scrubbers for controlling ammonia and a catalytic oxidizer for controlling VOC emissions from the laminators.

### 1.3. Description of Previous Air Emission Permits

The Permittee received several air emissions permits from the MPCA starting in 1985. See Attachment 5 to this TSD for a listing and summary of the permits. In 1996, Amendment No. 6 to 884-91-OT-2 was issued. That amendment contained limits to allow the Facility to avoid major source classification under NSR. Those limits will be replaced with new total facility limits in this permit. This new Part 70 permit will supersede all previous air permits.

As part of the operating permit that was issued in 1991, the MPCA completed a Non-Criteria Emissions Study, or what is currently called an Air Toxics Review. The 1991 permit and its amendments contained limits that came out of that study. Those limits are carried forward in this permit.

### 1.4. Description of any changes allowed with this permit issuance

This permit pre-authorizes certain changes at the facility that can be made over the life of the permit. The facility can modify existing equipment and replace existing equipment with similar units of equal or lesser capacity as long as all permit conditions are met, and as long as no new applicable requirements are triggered.

### 1.5. Facility Emissions

**Table 1. Total Facility Permitted Potential to Emit Summary**

Note: See Section 3.2 of this TSD for more discussion of potential emissions.

| Pollutant | Production (tpy) | Insignificant Activities (tpy) | Total Facility (tpy) |
|---|---|---|---|
| PM | 4.26 | 5.7 | 9.96 |
| $PM_{10}$ | 3.69 | 5.7 | 9.39 |
| $NO_X$ | 45.7 | 0.5 | 46.2 |
| $SO_X$ | 42.3 | 0 | 42.3 |
| VOC | 205 | 40 | 245 |
| CO | 16.2 | 0 | 16.2 |
| Total HAP | 205 | 40 | 245 |

**Table 2. Facility and Permit Classification**

| Program | Major/Affected Source | *Synthetic Minor | *Minor |
|---|---|---|---|
| Prevention of Significant Deterioration | | X (VOC) | |
| Nonattainment Area Review | NA | NA | NA |
| Part 70 Permit Program | X | | |
| Part 63 Program | X | | |

*Refers to potential emissions that are less than those specified as major by 40 CFR § 52.21, 40 CFR pt. 51 Appendix S, and 40 CFR pt. 70.

## 2. Regulatory and/or Statutory Basis

The Facility has taken limits to avoid major source classification for New Source Review (40 CFR § 52.21). The Facility is a major source under the federal operation permits program (40 CFR pt. 70) and the National Emissions Standards for Hazardous Air Pollutants (NESHAPs, 40 CFR pt. 63).

See Attachment 1 of this TSD for the specific permit limits and their basis (Form CD-01).

**Table 3. Regulatory Overview**

| Level* | Applicable Regulations | Comments: |
|---|---|---|
| TF | 40 CFR § 52.21 | PSD Prohibition: States that the Permittee cannot become a major source without getting a permit amendment (because the permit pre-authorizes construction for a non-major facility). |
| | Minn. R. 4410.4300 and Minn. R. 4410.4400 | EAW Triggers. The permit has a cap set at greater than 100 tons over current emissions. This language warns the Permittee that this rule still applies. |

| Level* | Applicable Regulations | Comments: |
|---|---|---|
| | Minn. R. 7007.0800, subp. 2 | Prohibition on emitting methylene chloride. Carried forward from previous permit (limit from ATR). |
| | Minn. R. 7007.0800, subp. 2 | Prohibition on emitting thiourea. Carried forward from previous permit (limit from ATR). |
| | 40 CFR § 52.21 | PSD. Limit and tracking requirements for insignificant VOC sources to keep the entire facility under the major source threshold for PSD. |
| | 40 CFR § 63.52(e) | Part 2 MACT Hammer Application. This is due within 24 months of the date that the Part 1 submittal was received. This was received by the MPCA on May 15, 2002; therefore, the Part 2 application is due by the same date in 2004. |
| | 40 CFR pt. 82 | Ozone Depleting Substances rules that are enforced by EPA. |
| GP 001 | 40 CFR § 52.21 | Prevention of Significant Deterioration (PSD). Limits taken to avoid major source and modification classification under PSD for VOC. The VOC limit is a rolling limit due to substantial and unpredictable variations in operation.<br>This permit pre-authorizes the replacement and modification of the listed units. All emissions are tracked under the cap. |
| | Minn. R. 7011.0715 | Standards of Performance for Post 1969 Industrial Process Equipment. This is listed here to streamline the permit. |
| GP 002 | Minn. R. 7011.0510 | Standards of Performance for Pre-Jan. 31, 1977 Indirect Heating Equipment. Units burn only natural gas or propane. |
| GP 003 | Minn. R. 7011.0515 | Standards of Performance for Indirect Heating Equipment from Jan. 31, 1977, or later. Units burn No. 2 fuel oil, natural gas or propane. Sulfur limit for fuel. |
| GP 004 | Minn. R. 7011.2300 | Standard of Performance for Stationary Internal Combustion Engines. Fuel limited to natural gas only. Emergency generators limited to 500 hrs/yr per EPA PTE guidance. |
| EU 003 | Minn. R. 7011.0515 | Standards of Performance for New Indirect Heating Equipment. Fuel limited to natural gas or propane. |
| EU 012 | Minn. R. 7011.0610 | Standards of Performance for Direct Heating Equipment. Catalytic oxidizer burner limited to natural gas and propane only. |
| CE 002 | 40 CFR § 52.21; | PSD. Control efficiency and other operating parameter requirements to limit VOC PTE to avoid major source and modification classification under PSD. Control required for specific units and optional for others.<br>The control limits are written as destruction efficiency since the units controlled by this oxidizer having varying capture, and therefore varying overall control, efficiencies. The hood certification and evaluation requirement is listed but only |

| Level* | Applicable Regulations | Comments: |
|---|---|---|
| | | applies to the slot/enclosure exhausts for times when credit is taken. |
| | Minn. R. 7017 | Performance Testing. |
| CE 003 and 004 | Minn. R. 7007.0800, subp. 2 | Ammonia controls and emissions limits. Previous air permit included an air toxics review that resulted in ammonia emissions limits (lb/hr) as well as control efficiencies and operating parameter limits. These are carried forward and the monitoring updated. |

*Level --- EU = emission unit, GP = group, TF = total facility, SV = stack/vent, CE = control equipment

## 3. Technical Information

### 3.1. Pre-authorized Changes

As briefly described earlier, the permit pre-authorizes certain changes that might otherwise be considered modifications under state and federal rules. This permit pre-authorizes the modification and replacement of the existing emissions units as long as all permit conditions are met and as long as no new applicable requirements are triggered.

The permitted allowable emissions take into account the maximum hourly capacities and emissions controls. All applicable requirements and necessary monitoring are in the permit. The authorized changes will not cause an emissions increase under Minn. R. 7007.1200, subp. 3 (calculating emissions increases for non-Title I changes); so they are not modifications and can be made without the need for an amendment.

### 3.2. Potential to Emit Calculations

Attachment 2 to this TSD contains detailed spreadsheets and supporting information submitted by the Permittee and revised by the MPCA. Emissions are generally calculated using a mass balance for most process equipment, with EPA or other MPCA-approved emissions factors used for some processes as well as combustion.

**Laminating (EUs 015, 016, 017, 020, 023-027, 080-084, 087-089, 091, and 119)**

The laminating operations consists of several process steps. See Figure 1 (paper copy only). Specifically, the mix room (product weighing/dispensing, mixing, dryers), laminating (laminator and slot exhaust), equipment cleaning, and dryers/ovens (insignificant activities).

The dryers are bottlenecks to the laminating process (the product requires a certain amount of in-line drying time); however, in order to simplify the PTE calculations, these bottlenecks were not considered.

For product weighing (EU 016), the PTE is calculated using the maximum throughput and EPA emissions factors. EU 089 is a dispensing station used for dispensing an MDI mixture. The PTE is calculated using MPCA-approved formulas developed based on physical chemistry principles (see Attachment 7). The Permittee stated that they believed that that MDI emissions were zero or negligible. MPCA calculations show this to be the case (less than 3E-08 tpy) – therefore they do not need to be tracked as part of the VOC permit calculations.

An EPA mixing emissions factor of 10% is assumed for all other VOC/VHAP ( EUs 017, 020, 024, 087, 088, 091, and 119). Per EPA guidance, if the mixer is covered or enclosed, the factor is adjusted to 6%. No specific emissions factors exist for the particulate emissions from mixing. A conservative PTE was calculated using an EPA emissions factor for concrete batch mixing.

All of the dryers and ovens at this facility are electric and do not have combustion emissions. However, the dryers in the mixing room (018, 021, and 022) do have volatile emissions from the materials being dried. For all of these units, a mass balance was used – the maximum amount of material entering the dryer (e.g., rags, drums) times the highest VOC/HAP content to obtain the maximum hourly emissions. 100% of the VOC/HAP is emitted. For the permit calculations, these emissions are already accounted for in other calculations – the amount of material left in the drum or rags is not credited and already assumed to be emitted at the original process (e.g., mixing, laminating, cleaning, etc.).

The PTE from the laminating area emissions (EUs 015, 023, 025, 026, 027, and 080-084) is based on a mass balance -- capacity times highest content materials to obtain maximum hourly emissions of the given pollutant. The emissions are vented at two points on four of the units. (The other two units only have one vent that is controlled.) The point called "slot exhaust" or "enclosure" is the ventilation point that occurs prior to the dryer. The Permittee has stated that a small percentage of the materials are emitted at this point (7%) with the remaining amount being carried over to the dryer. The Permittee has the option of venting the enclosure/slot exhausts to a control device, but the areas are not currently totally enclosed. This means that the air has a lower concentration of VOC and is more difficult and expensive to control. The remaining emissions occur in the dryer zone (called "laminator" emissions) and are controlled with the catalytic oxidizer (CE 002). The control efficiency is based on site-specific performance testing. The dryers are considered total enclosures. The 7% and 93% appear to be based on past stack testing, but the previous test reports could not be found (from early 1990's); therefore, the permit requires that this assumption be verified with stack testing.

Equipment cleaning (EU 014) emissions are calculated using a mass balance based on the maximum capacity times the maximum content materials. All VOC/HAP is assumed to be emitted.

**Combustion (EUs 001-003, 006, 008, 012, 085, and 103)**

The combustion potential emissions are calculated based on equipment capacity, allowable fuels, and EPA published emissions factors (AP-42).

**Wet Processes (EUs 031, 036, 038, 042-046, 092, 098-102, and 120)**

The Permittee uses the term "wet processes" to describe the various baths and chemistries used in flexible printed circuit fabrication. In general, there are very few EPA emissions factors available for these processes. EPA has published factors for chromium electroplating, but not for flexible printed circuits which use a broad spectrum of bath materials. For these processes, the MPCA has published guidance for calculating PTE. There are two basic methods for calculating the PTE for these units: 1). mass balance where all of the material used (or added to the bath) is assumed to be emitted in the same form (e.g., VOC in = VOC out), 2). emissions factors from engineering or industrial handbooks.

1). For volatile bath materials, if the make-up or bath addition quantities were known, this was used to determine the PTE. The amount of make-up (or bath additions) is assumed to be emitted as VOC/HAP. For some of the baths, the entire bath is dumped at some frequency, so the loss rate was not known. However, make-up records from similar baths were used to estimate the loss rates. In general, 10% loss of volatile bath materials was used for calculating PTE.

2). There are two sources used for emissions factors for this facility – one for particulate from soldering and one for the bath chemistries. For soldering, Modern Pollution Control Technology contains an emissions factor for lead. For the various baths, the Electroplating Engineering Handbook contains several tables that give gassing rates of specific pollutants for different processes (e.g., copper etching with sulfuric acid emits sulfuric acid mist). These gassing rates correspond to a percent loss factor listed in Modern Pollution Control Technology (0-5%).

**Imaging (EUs 047-079, and 104, 105, 110, 116, 117, and 118)**

The PTE from the imaging processes is based on a mass balance -- capacity times highest content materials to obtain maximum hourly emissions of the given pollutant. There are no emissions controls in this area.

**Insignificant Activities**

The PTE calculations for the IAs use the same approach as the emissions units.

**HAPs**

The maximum numbers in Table 1 for volatile HAPs are limited by the total VOC limit of 205 tons per year. For example, the facility can only emit up to 205 tons per year of toluene since it is a VOC as well as HAP. However, this is essentially impossible, since this would mean that the facility would then not be able to use any other volatile material. See Attachment 2 for more details about specific calculations.

### 3.3 Permit Calculations

**Mixing**

Appendix I of the permit shows the various formulas that the Permittee will use to calculate VOC emissions on a monthly basis. For most operations, these are based on a simple mass balance approach (e.g., bath makeup amounts are assumed to be emitted), but for the laminating process where control is applied for only part of the process, the percentage released at various parts of the process is relevant to determining the actual emissions. For example, if it is assumed that all of mixing accounts for 2% loss (assumed in the previous permit), then 98% of the original material would be assumed to enter the laminating area (see Attachment 8 for a process flowchart). But if 10% is lost at mixing, a much lower percentage would be considered controlled; therefore, a higher amount emitted.

The previous permit made various assumptions in this respect, but no documentation was found to support those assumptions. Some of the documentation indicates some of it was engineering judgment while others may have been based on testing. However, no actual data could be found. Therefore, this permit uses the same PTE assumptions detailed above (e.g., mixing is 10 or 6%) until such time that the Permittee conducts the necessary analysis or testing to propose new factors.

For mixing, the Permittee will have a specification number for each material. This number indicates how many times the given material was handled or mixed. For example, some materials might be weighed at EU 016 (factor of 0.92 lb VOC/ton weighed), then mixed at EU 020 (factor of 6%), then mixed again at EU 017 (factor of 6%). This sequence shows the total emissions:

- 100 lbs weighed: 0.046 lbs emitted
- 99.96 lbs mixed: 6.0 lbs emitted
- 93.96 lbs mixed: 5.6 lbs emitted
- 88.3 lbs continues to laminating area; total emissions of 11.7 lbs, or 11.7% of original material.

For each material specification, the Permittee can determine a combined emissions factor or may calculate each step separately in the monthly calculations.

**Laminating**

The Permittee does not currently track which mixed materials are used at the specific laminators. In addition, while the mix room records can be used to calculate the total VOC mixed, not all of it is used on site. Some of the materials mixed in the mix room are not used at the facility – they are mixed and sold. If the Permittee were to just use the total mixed quantities to calculate the laminating emissions, this would grossly over-estimate actual emissions. The Permittee may develop a tracking system to measure and record the actual amount being used at the specific laminators. In the meantime, the Permittee will keep records that differentiate between materials leaving the mix room for on-site versus off-site use. When completing the monthly calculations, the Permittee will use only the on-site materials when calculating emissions from the laminators.

**Combustion**

The permit gives the Permittee the option of calculating actual VOC emissions from fuel combustion on a monthly basis. If the Permittee does not wish to do this calculation, the VOC potential emissions from combustion will be used in the total VOC calculation. The emissions from combustion are low enough (1.25 tpy) that the additional tracking might not be worth the effort unless the Permittee finds that they are approaching the permit limit.

**Wet Processes**

A mass balance is used for these areas based on usage records. For some units, the Permittee has usage records at the unit, but not for all of them. These materials are used in a disperse manner around the facility. Rather than try to track small amounts at the individual units, the permit allows the Permittee to use the chemical room records. These materials are purchased in 55-gallon drums and stored in a central area until they are needed. At that time, a drum is taken from the room and brought onto the floor for use – at that time, it will be considered "used" or emitted.

**Miscellaneous Sources**

The remaining VOCs are used in smaller quantities and will be tracked monthly based on purchase records. A mass balance is then used to calculate the emissions.

### 3.4. Ammonia Limits and Controls

Air Permit No. 884-91-OT-2 was issued in April of 1991. That permit contains various limits that resulted from a non-criteria air pollutant study, or an air toxics review. The permit required the Facility to phase-out the use of certain chemicals (e.g., methylene chloride) as well as hourly emissions limits on ammonia. Controls for ammonia were also required (with the necessary control equipment parameters, operation, and maintenance requirements). Those hourly limits were amended in 1993 and 1997. On both occasions, site-specific modeling was done prior to setting the limits. Since 1997, the Minnesota Department of Health has proposed a new acute Health Risk Value for ammonia. The new value is higher, meaning the exposure can be greater before requiring further evaluation; therefore, the previous limits are considered conservative and are carried forward in this permit. See Attachment 6 to this TSD for the modeled values and HRVs.

### 3.5. VOC Limit

MPCA and EPA have published guidance on setting limits to avoid applicable requirements. While the federal NSR threshold is 250 tons per year, the various permit limits need to ensure that the source does not trigger this level. The actual value of permit limits should be based on the accuracy of the compliance method, the variability of the data, the frequency of recordkeeping, etc. as well as the potential and actual emissions of non-limited or non-tracked units. We leave room to account for uncertainty in the calculations and other non-tracked units to make sure that the permittee doesn't inadvertently trip the major threshold -- by updated factors, better data, etc.

Historically, the MPCA has issued many permits where facilities use daily material usage records and MSDS's for compliance purposes with the total PTE at 245 tpy. The current trend for this type of compliance method is to leave an even larger margin (e.g., 240 tpy). However, for this permit, the total limited PTE is 245 tons per year for the following reasons.

- First, there are no non-tracked VOC emissions. All VOCs are under either the GP limit or the IA limit.
- The IA limit is a PTE limit, not an actuals limit, so the actual emissions are much less than the limit. It may be technically possible to emit 40 tons from the IAs, but this is very, very improbable. Especially since many of activities are listed under Minn. R. 7007.1300, subp. 4 -- their PTEs are over 1 tpy but their actuals are less. The company has estimated that the total IA VOC actuals is roughly 2 tons (compared to the current PTE of 28). For IAs, it doesn't seem likely that the actuals would ever approach the PTEs: so there is little risk of them tripping the major source threshold on an actuals basis. AND
- For this permit, the assumptions used in the permit calculations are more conservative than the traditional usage records. A couple examples:

  Over half the emissions come from laminating. The current mixing emissions calculations likely overestimate their actuals by several orders of magnitude.

  Approximately 40% of their emissions come from their wet processes. The permit assumes that all of the used VOC is emitted. The Permittee has stated that a significant portion ends up in their wastewater (and this is likely true since they do have a wastewater treatment system), but since they can't or don't want to prove this on an on-going basis, this is counted as emitted.

In addition, the types of records they are using are much better than the traditional MSDS. For a significant portion of their usage, they aren't buying mixed materials. They buy raw solvents/chemicals and resins to formulate their own materials -- so the data is based on their own specifications, not a supplier MSDS range.

### 3.6. Periodic Monitoring

In accordance with the Clean Air Act, it is the responsibility of the owner or operator of a Facility to have sufficient knowledge of the Facility to certify that the Facility is in compliance with all applicable requirements. In evaluating the monitoring included in the permit, the MPCA considered the following:

- the likelihood of violating the applicable requirement;
- whether add-on controls are necessary to meet the emission limit;
- the variability of emissions over time;
- the type of monitoring, process, maintenance, or control equipment data already available for the emission unit;
- the technical and economic feasibility of possible periodic monitoring methods; and
- the kind of monitoring found on similar units.

Table 4 summarizes the periodic monitoring requirements for those emission units for which the monitoring required by the applicable requirement is nonexistent or inadequate.

**Table 4. Emission Units Subject to Periodic Monitoring**

| EU/ GP/ CE | Emission limit (Basis) | Additional Monitoring | Discussion |
|---|---|---|---|
| Facility | shall not emit thiourea or methylene chloride | none | The Permittee is required to keep material content records as part of the VOC tracking, so this is adequate to demonstrate these materials are not in use. |
| | VOC PTE of listed Insignificant Activities $\leq$ 40 tons per year | Recordkeeping of total PTE, updated prior to making any change | Tracking of actual emissions from these units would be overly burdensome, so the Permittee has chosen to limit their PTE. If the PTE approaches the limit the Permittee would need to obtain a permit amendment to shift the VOC limits on production and IAs or to move some of the IAs under the production limit. Either would require a major amendment. |
| Total Facility VOC Limits: GP 001 | VOC $\leq$ 205 tons per any 12 month period (limit to avoid NSR) | Recordkeeping: Daily records of material usage; On-going MSDS records of coating contents; Monthly calculations of emissions. | Records can be generated on a daily basis for the majority of materials using daily mixing logs. Some materials are not used or replenished daily. For these, a record will be generated whenever material is requisitioned from the storage area. The remaining materials are used in small quantities and purchase/delivery records are adequate.<br>The permit contains procedures for developing site-specific emissions factors |

| EU/ GP/ CE | Emission limit (Basis) | Additional Monitoring | Discussion |
|---|---|---|---|
| | | | for the mix room and for ethanolamine. Based on production records, the general EPA factors are likely significantly overestimating the emissions (amount lost at mixing would be cost-prohibitive).<br>The facility's current actual emissions are roughly 70 tons per year of VOC. |
| limits on pre-authorized equipment | hourly PTE less than or equal to current units | On-going record of equipment and annual report<br>Record prior to making the change | This allows the replacement of equipment with differing numbers of pieces of equipment, so long as the total hourly PTE is the same or less (e.g., can replace two units with one larger unit). |
| | ≤ various grain loading limits based on airflow<br>Opacity: ≤ 20 % (Minn. R. 7011.0715) | none | These units are not expected to generate significant particulate matter. Calculations show PTEs significantly under the allowable emissions. |
| "Existing" Boilers: GP 002 | PM: ≤ 0.6 lb/MMBtu<br>Opacity: ≤ 20 % with exceptions<br>(Minn. R. 7011.0510) | Recordkeeping: Monthly Fuel records | These units use natural gas and propane; therefore, the likelihood of violating either of the emission limits is very small. Design based PTE for each unit, using AP-42, is 0.0076 compared to the rule limit of 0.6 lb/MMBtu. |
| "New" Boilers: GP 003 | PM: ≤ 0.4 lb/MMBtu<br>Opacity: ≤ 20 % with exceptions<br>(Minn. R. 7011.0515) | Recordkeeping: Monthly Fuel records and fuel sulfur certifications | These units use No. 2 fuel oil, natural gas, and propane. Using AP-42 factors and the sulfur content limit results in a PTE of 0.014 lb/MMBtu, compared to the limit of 0.4 lb/MMBtu. |
| | Fuel limited to natural gas and No. 2 Fuel Oil, by design | Monthly Fuel records | |
| | Sulfur Content of Fuel Oil ≤ 0.5% by weight | Fuel certification | Distillate fuel oil is oil that meets ASTM D396-78. The ASTM definition requires sulfur < 0.5%; therefore, the likelihood of the violating this limit is very small. Fuel certification records are adequate for periodic monitoring. |

| EU/ GP/ CE | Emission limit (Basis) | Additional Monitoring | Discussion |
|---|---|---|---|
| Emergency Generators: GP 004 | $SO_2$: ≤ 0.5 lb/MMBtu<br>Opacity: ≤ 20 % with exceptions<br>(Minn. R. 7011.2300) | Recordkeeping: Monthly records of fuel and documentation showing that they are emergency generators | These units use natural gas and propane; therefore, the likelihood of violating either of the emission limits is very small. Design based PTE for each unit, using AP-42, is 0.00006 compared to the rule limit of 0.5 lb/MMBtu. Records are required in order to show the units qualify for EPA's policy memo for emergency generators. |
| EU 003 | PM: ≤ 0.4 lb/MMBtu<br>Opacity: ≤ 20 % with exceptions<br>(Minn. R. 7011.0515) | Recordkeeping: Monthly Fuel records | This unit uses natural gas and propane; therefore, the likelihood of violating either of the emission limits is very small. Design based PTE, using AP-42, is 0.0076 compared to the rule limit of 0.4 lb/MMBtu. |
| EU 012 | ≤ various gr/dscf limits based on airflow<br>Opacity: ≤ 20 % with exceptions (Minn. R. 7011.0610) | Recordkeeping: Monthly Fuel records | This is the thermal oxidizer burner. It uses use natural gas; therefore, the likelihood of violating either of the emission limits is very small. Design based PTE is less than 0.4% of the allowable rate. |
| CE 002 | VOC: Control Efficiency of 92% (limit to avoid NSR)<br>Temperature limit ≥ 645 °F inlet | Temperature monitoring, Recordkeeping, O & M, inspections | Monitoring based on the Minnesota Performance Standard for Control Equipment is adequate to have a reasonable assurance of compliance.<br>There is some additional monitoring related to units where control is optional and times when control is not required. The previous air permit allowed the laminators to be run without controls when the VOC content was less than 10% by weight; however, the Permittee no longer requires this option. They do run several non-VOC materials – at which times control will not be required.<br>The permit allows two temperature-monitoring scenarios. Currently, the Permittee does not have the capability to monitor the 3-hour rolling average temperature and must use the absolute minimum option (e.g., any temperature below the 3-hour tested average is considered a deviation). The Permittee may purchase the necessary equipment during the permit term. When it is installed, the Permittee must notify the MPCA that they have begun monitoring the average temperatures. |

| EU/ GP/ CE | Emission limit (Basis) | Additional Monitoring | Discussion |
|---|---|---|---|
| | | | Performance testing is required within 180 days of issuance of the permit for both destruction efficiency (recent testing shows > 97%) and carryover of VOC to the dryer versus emitted at the slot/enclosure exhaust. |
| CE 003 | Ammonia $\leq$ 6.2 lb/hr (limited based on toxics modeling – state-only requirements)<br>Efficiency $\geq$ 85%<br>Pressure Drop $\leq$ 6 inches of water column<br>pH < 3.5 | Pressure drop and pH monitoring, Recordkeeping, O & M, inspections | This monitoring is mainly carried forward from the previous permit with some additional details. The monitoring is modeled on the Minnesota Performance Standard for Control Equipment. The permit requires daily monitoring for the main parameters, with periodic inspections and O&M requirements.<br>The Permittee has previous stack test data and has tested significantly under the emissions limit and higher than the minimum efficiency. Most recent testing in 1998 showed an efficiency of 94% (vs. 85%) and 0.98 lb/hr (vs. 6.2 lb/hr). No further testing is required at this time. |
| CE 004 | Ammonia $\leq$ 0.56 lb/hr (limited based on toxics modeling – state-only requirements)<br>Efficiency $\geq$ 85%<br>Pressure Drop $\leq$ 6 inches of water column<br>pH < 3.5 | Pressure drop and pH monitoring, Recordkeeping, O & M, inspections | Same as CE 003. |

### 3.7. Deviations from Delta Guidance

In general, the permit meets the MPCA Delta Guidance for ordering and grouping of requirements. However, the following are areas that deviate from the guidance: appendices, groups for unit-specific limit, and using an "empty" group.

A. This permit deviates slightly from Delta guidance in the use of appendices. While appendices are fully enforceable parts of the permit, in general, any requirement that the MPCA thinks should be tracked (e.g., limits, submittals, etc.), should be in Table A or B. The main reason is that the appendices are word processing sections and are not part of the tracking system. Violation of the appendices can be enforced, but the computer system will

not automatically generate the necessary enforcement notices or documents. Staff must generate these.

Appendix I contains the VOC Calculation Procedure. These requirements are fairly detailed and lengthy and cannot fit into the data entry fields for Table A. Table A states the company must follow the procedures in Appendix I.

The second appendix meets Delta guidance – it is the listing of Insignificant Activities and their applicable requirements. This is a fairly standard way to include these in the permit, since it is highly unlikely the MPCA would need to have these as trackable items in the Delta database.

Appendix III is a printout from Delta of the control equipment and emissions unit description, Forms GI-0BA and GI-05B. This documents the correlation of specific emissions units to specific control equipment as well as the capacities of each unit. Delta does not show this data as part of the "associated items" in Table A of the permit.

B. The permit deviates from guidance by using groups for requirements that apply to individual pieces of equipment. This is done in order to streamline the permit.

C. The first group listed in the permit (GP 001) has no associated items. Usually, all the items belonging to the group are linked electronically in Delta. This wasn't done here in order to make the permit more readable. There are over 100 emissions units in the group and listing them traditionally would result in over two pages in the permit just showing this list. By the time you get to the actual permit limits, you no longer can see the "Subject Item" that you are reading. Instead, they are listed using a CD screen as the first item in the permit under GP 001.

It may be apparent that not all emissions unit and control equipment numbers appear in the permit or in Delta. The Permittee included several pieces of equipment in their original permit application that were later determined to not be emissions units or were deemed insignificant. These units were then deleted from Delta, so the numbers no longer appear in the database. See Attachment 3 for the IA PTE calculations, which includes a listing by previous EU number for those that apply.

### 3.8. Insignificant Activities

The Permittee listed several current insignificant activities in the permit application and supplemental submittals, as noted in Table 5. The permit is required to include periodic monitoring for all emissions units, including insignificant activities, per EPA guidance. The insignificant activities at this Facility are only subject to general applicable requirements. Using the criteria outlined earlier in this TSD, the following table documents the justification why no additional periodic monitoring is necessary for the insignificant activities at this site. See Attachment 3 of this TSD for PTE information for the insignificant activities.

**Table 5. Insignificant Activities**

| Insignificant Activity | General Applicable Emission limit | Discussion |
|---|---|---|
| Infrared electric ovens | Opacity $\leq$ 20%<br>(Minn. R. 7011.0110) | While no emissions estimation method exists for these units, based on general knowledge of how they operate, it is highly unlikely that they could generate |

| Insignificant Activity | General Applicable Emission limit | Discussion |
|---|---|---|
| | | visible emissions. In addition, these units are vented directly into the building, so testing is not feasible. |
| Laboratory equipment | PM, variable depending on airflow<br>Opacity ≤ 20%<br>(Minn. R. 7011.0715) | Most of these units are laboratory hoods and are not reasonably expected to generate particulate matter; therefore, it is highly unlikely that they could violate the applicable requirement. |
| Brazing, soldering or welding equipment | PM, variable depending on airflow<br>Opacity ≤ 20%<br>(Minn. R. 7011.0715) | For these units, based on EPA published emissions factors, it is highly unlikely that they could violate the applicable requirement. In addition, these units are operated and vented inside a building, so testing for PM or opacity is not feasible. |
| Individual units that have potential emissions of less than 1 tpy of various criteria pollutants | PM, variable depending on airflow<br>Opacity ≤ 20%<br>(Minn. R. 7011.0715) | Roughly 25 units qualify under this category. Only 4 of them could possibly generate particulate matter. For those units, the calculated PTEs are significantly under the allowable emissions rates. |
| Individual units that have actual emissions of less than 1 tpy of various criteria pollutants and less than various HAP thresholds listed in rule | PM, variable depending on airflow<br>Opacity ≤ 20%<br>(Minn. R. 7011.0715) | Roughly 45 units qualify under this category. 25 of those could possibly generate particulate matter. For those units, the calculated PTEs are significantly under the allowable emissions rates.<br>In addition, many of the units are operated and vented inside a building, so testing for PM or opacity is not feasible. |

## 4. Conclusion

Based on the information provided by Northfield Acquisition Co. (previously Sheldahl Inc.), the MPCA has reasonable assurance that the operation of the emission facility, as described in the Air Emission Permit No. 13100005-001 and this technical support document, will not cause or contribute to a violation of applicable federal regulations and Minnesota Rules.

Staff Members on Permit Team: Peggy Bartz, Tom Sinn
Peer Review: Marshall Cole and Toni Volkmeier

Attachments:

1 Form CD-01 (Compliance Plan)
2 PTE Calculations
3 Insignificant Activities PTE
4 Facility Description
5 Air Permit History
6 Ammonia Limits
7 Supporting information for MDI calculations

**ATTACHMENT 1**
**COMPLIANCE PLAN**
**(Form CD-01, paper copy only)**

**ATTACHMENT 2**
**MPCA EMISSIONS CALCULATIONS**
**(paper copy only)**

**ATTACHMENT 2**
**EMISSIONS CALCULATIONS**

This attachment contains the MPCA PTE calculations (based on Permittee's permit application) as well as an evaluation of the allowable emissions under Minnesota rules.

| Title | Description |
|---|---|
| PTE Table | Spreadsheet calculating the PTE of all emissions units, with footnotes. Total PTE listed for criteria pollutants only. |
| Allowable Emissions | Comparison of calculated PTEs with the allowable emissions under various Minnesota performance standards. |

**ATTACHMENT 3**
**INSIGNIFICANT ACTIVITIES**
**(paper copy only)**

**ATTACHMENT 4**
**FACILITY DESCRIPTION FROM DELTA**
**(paper copy only)**

**ATTACMMENT 5**
**AIR PERMIT HISTORY**

## AIR PERMIT HISTORY

| Permit Number | Permit Type | Issuance Date | Activity | Limits | Increase | Conclusion |
|---|---|---|---|---|---|---|
| 884-85-OT-1 | Operating | June 24, 1985 | 1 new boiler. Covers boilers (6) and laminators (3) | Rule limits only; unit specs listed. | No PTE given. | Updated as needed. |
| Amendment 1 to 884-85-OT-1 | Amendment (no type listed, no PN) | April 14, 1988 | Limits use of No. 2 fuel oil in order to keep total PTE less than 100 tpy (fee threshold). | No. 2 fuel oil to 2,600,000 gallons/year, sulfur limit of 0.5% by wt | None. Decrease in PTE. (VOC PTE is listed as 1424 tpy, SO2 as 92 tpy). | Carried forward in 1991 permit. |
| 884-90-I/O-1 | Installation/ Operation | April 2, 1990 | Installation of catalytic oxidizer on 4 laminators (8861, 10, 5, and 39"). Not clear why 4 now and only 3 initially since original permit gives no unit data. | Minn. R; VOC < 25.3 lb/hr; cat oxd. at 620 F and 95% destruction; VOC testing required. | Lists controlled PTE as 111 tpy (assumes 93% control and total enclosure) | Replaced in 1991 permit. |
| 884-91-OT-2 | Total facility permit | April 23, 1991 | Install (??) CO (lists install date as 1989), 2 ammonia scrubbers, one new etcher, and extension of 4 stacks (laminators). | Minn. R. limits; Controlled VOC < 27.3 lb/hr on CO exhaust, ammonia < 0.56 lb/hr and 0.39 lb/hr (etching at pts 26 and 27), all stat basis; CO temp of 700 F (log of catalyst addition, quarterly testing of reactivity) daily records of pressure drop across scrubbers. Limits* Methylene chloride reductions required over 5 years. Must be eliminated by Sept. 1, 2000; Eliminate thiourea emissions by Dec. 31, 1991; fuel oil limits carried forward | VOC PTE listed as 197 tpy | Limits are toxics-related – carried forward as state-only requirements. |
| Amendment 1 to 884-91-OT-2 | Amendment (no type listed, no PN) | Dec. 20, 1991 | Replace a hood on the tape cure area. | None | None | NA |

**AIR PERMIT HISTORY**

| Permit Number | Permit Type | Issuance Date | Activity | Limits | Increase | Conclusion |
|---|---|---|---|---|---|---|
| Amendment 2 to 884-91-OT-2 | Amendment (no type listed, no PN) | February 3, 1992 | Replace two etching modules and a conveyor solvent stripper. | None | None | NA |
| Amendment 3 to 884-91-OT-2 | Amendment (no type listed, no PN) | October 21, 1992 | Stack extension on oxidizer to 60 feet. | None | None | NA |
| Amendment 4 to 884-91-OT-2 | Amendment (no type listed, no PN) | April 23, 1993 | New wet process installed at Pt. 27 and a new natural gas boiler to replace 2 smaller boilers. | None | None | NA |
| Amendment 5 to 884-91-OT-2 | Amendment (no type listed, no PN) | June 15, 1993 | Pt 27: one new etch module, to E/S/A line, one new etch and strip line; Pt. 26&27: limits changed on controls. Pt. 13: new production laminator and one pilot laminator. | Scrubbers: 85% (from 95%), pH less than 3.5; pressure drop less than 6 inches 2.66 lb/hr ammonia (from 0.39). CO: 92% (from 95%). 33.2 lb/hr of VOC; 780 deg F | Net PTE change listed as 26 tpy of VOC. | Replaced in Amendment 6. |
| Amendment 6 to 884-91-OT-2; 13100005-011 | Major Amendment | December 19, 1996 | Install: 1 laminator (35), 1 laminator and slot exhaust (36), 1 gas fired chillers (37, 190, 191) and 1 emerg. generator (41); removal of 2 laminators and 2 slot exhausts and a generator. | Limits to avoid PSD. Control required when VOC content is greater than 10%, 92% control, no temp listed in permit (set based on testing), quarterly cat. sample required, VOC capped at 235 tpy (formulas specified). Annual testing required of CO. No longer hourly limits Rule limits as well. NO TSD in file. | PTE now listed in permit as 235 tpy of VOC, PM 8 tpy, NOx 73 tpy, SO2 55 tpy, and C) 48 tpy. Major for HAPs. VOC increase is listed as 100.6 tpy (no EAW). | Will be replaced with new permit limits. |

**AIR PERMIT HISTORY**

| Permit Number | Permit Type | Issuance Date | Activity | Limits | Increase | Conclusion |
|---|---|---|---|---|---|---|
| Amendment 7 to 884-91-OT-2; 13100005-012 | Amendment (type not listed, doesn't seem to be public noticed) | July 15, 1997 | Change to ammonia limitations (it was modeled). | Limit now 6.2 lb/hr on Pt 27. | No TSD, so none listed. | Carried forward as state-only requirements. |
| Amendment 8 to 884-91-OT-2; 13100005-014 | Administrative Amendment | June 26, 2000 | Extension to testing deadline. | NA | NA | NA |
| Amendment 9 to 884-91-OT-2; 13100005-015 | Minor Amendment | June 26, 2000 | Replace blower system to oxidizer with a dual blower. Required company to operate a control panel to only allow operation of one of the two blowers into the oxidizer at a time. | NA | NA | NA |

* Limits on controls as follows: CO at 95% destruction, 700 deg F, catalyst addition at break down rate of approx. 20 lb/1000 hours of operation; Scrubbers at 95% removal, solution pH of 6.5 or less, pressure drop between 2-3 inches of H2O. These were later replaced.

**ATTACHMENT 6**
**AMMONIA LIMITS**

# Ammonia Limits

In 1997, the MPCA reviewed modeling completed by Barr Engineering as part of a proposed permit amendment. Based on that modeling, an amendment was issued that revised the ammonia limits to the following levels:

- SV 018 at 0.56 lb/hr (Delta SV 045)
- SV 037 at 6.2 lb/hr (Delta SV 046)

The 1997 site-specific modeling showed the following:

- Maximum 1-hr Modeled Concentration: 1223 $\mu g/m^3$ (on plant property) (range of 638 - 1223)
- Maximum Annual Modeling Concentration: 8.48 $\mu g/m^3$ (range of 6.08 - 8.48)

The HRVs in 1997 were 1000 $\mu g/m^3$ and 80 $\mu g/m^3$, 1-hr and annual, respectively. The modeled concentrations were deemed acceptable at that time because the 1-hr maximum was on plant property. Values off plant property were under 1000 $\mu g/m^3$.

Currently, the HRVs are 3200 $\mu g/m^3$ and 80 $\mu g/m^3$. The modeled concentrations are significantly under the HRV's. No further analysis is warranted at this time.

**ATTACHMENT 7**
**MDI SUPPORTING INFORMATION**
**(paper copy only)**