Permittee: RR Donnelley - Chanhassen
Facility name: RR Donnelley - Chanhassen
18780 78th St
Chanhassen, MN 55317-9310
Hennepin County

Operating permit issuance date: November 22, 2005

Expiration date: Non-expiring
* All Title I Conditions do not expire

Major Amendment: TBD

Permit characteristics: State; Limits to avoid Part 70/ Limits to avoid NSR; Limits to avoid NSR

The emission units, control equipment and emission stacks at the stationary source authorized in this permit amendment are as described in the submittals listed in the Permit Applications Table.

This permit amendment supersedes Air Emission Permit No. 05300222-004 and authorizes the Permittee to operate and modify the stationary source at the address listed above unless otherwise noted in the permit. 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 as defined in the state air pollution control rules unless the term is explicitly defined in the permit.

Unless otherwise indicated, all the Minnesota rules cited as the origin of the permit terms are incorporated into the SIP under 40 CFR § 52.1220 and as such are enforceable by U.S. Environmental Protection Agency (EPA) Administrator or citizens under the Clean Air Act.

Signature: [Signature]
This document has been electronically signed.
for Steven S. Pak, P.E., Manager
Air Quality Permits Section
Industrial Division

for the Minnesota Pollution Control Agency
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1. Permit applications table

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<thead>
<tr>
<th>Title description</th>
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<td>Minor Amendment</td>
<td>05/30/2012</td>
<td>05300222- 004</td>
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<td>05300222- 003</td>
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<td>07/11/2008</td>
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<td>04/17/1995</td>
<td>05300222- 001</td>
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2. Where to send submittals

Send submittals that are required to be submitted to the EPA regional office to:

Chief Air Enforcement
Air and Radiation Branch
EPA Region V
77 West Jackson Boulevard
Chicago, Illinois 60604

Each submittal must be postmarked or received by the date specified in the applicable Table. Those submittals required by Minn. R. 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 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

Send any application for a permit or permit amendment to:

Fiscal Services – 6th Floor
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 Document Coordinator notices of:

a. Accumulated insignificant activities
b. Installation of control equipment
c. Replacement of an emissions unit, and
d. Changes that contravene a permit term

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

AQ Compliance Tracking Coordinator
Industrial Division
Minnesota Pollution Control Agency
520 Lafayette Road North
St. Paul, Minnesota 55155-4194

Or Email a signed and scanned PDF copy to:
submitstacktest.pca@state.mn.us
(for submittals related to stack testing)
AQRoutineReport.PCA@state.mn.us
(for other compliance submittals)
(See complete email instructions in “Routine Air Report Instructions Letter” at
http://www.pca.state.mn.us/nwqh472.)
3. Facility description

The RR Donnelley - Chanhassen (Facility) is located at 18780 78th St in Chanhassen, Hennepin County, Minnesota.

RR Donnelly Chanhassen (facility) operates a commercial printing facility in Chanhassen, Minnesota. Air emission sources at the facility include heatset web offset lithographic printing presses along with associated dryers, inkjet presses, sheetfed presses, digital sheetfed press, and regenerative thermal oxidizer. The volatile organic compounds (VOC), and volatile hazardous air pollutant (HAPs) emissions from heatset web offset lithographic printing press and the associated dryers pollutants are vented to and controlled by the thermal oxidizer.

This permit authorizes the facility to add a new digital sheetfed press (EQUI 79).
4. Summary of subject items

<table>
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<tr>
<th>SI ID: Description</th>
<th>Relationship type</th>
<th>Related SI ID: Description</th>
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<tr>
<td>TFAC 1: RR Donnelley - Chanhassen</td>
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<td>EQU 2, EQU 3, EQU 4, EQU 5, EQU 6, EQU 7, EQU 8, EQU 9, EQU 10, EQU 15, EQU 17, EQU 18, EQU 55, EQU 60, EQU 61, EQU 62</td>
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<td>ACTV 4: All IAs</td>
<td>has members</td>
<td>EQU 2, EQU 3, EQU 4, EQU 5, EQU 6, EQU 7, EQU 8, EQU 9, EQU 10, EQU 15, EQU 17, EQU 18, EQU 55, EQU 60, EQU 61, EQU 62</td>
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<td>COMG 1: VOC/HAP Limit</td>
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<td>COMG 2: Direct Heating Equipment</td>
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<td>EQU 18, EQU 19, EQU 20, EQU 21, EQU 22, EQU 23, EQU 24, EQU 26, EQU 42, EQU 64, EQU 65, EQU 66, EQU 67, EQU 68, EQU 69, EQU 70</td>
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<td>COMG 3: Heat-set presses and associated dryers</td>
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<td>EQU 18, EQU 19, EQU 20, EQU 21, EQU 22, EQU 23, EQU 24, EQU 26, EQU 42, EQU 64, EQU 65, EQU 66, EQU 67, EQU 68, EQU 69, EQU 70</td>
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<td>COMG 4: Industrial Process Equipment Rule</td>
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<td>EQU 71, EQU 72, EQU 73, EQU 74, EQU 75, EQU 76, EQU 77, EQU 78, EQU 79</td>
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<td>EQU 2: Ink Jet Printing Unit - Printing Press</td>
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<td>EQU 71, EQU 72, EQU 73, EQU 74, EQU 75, EQU 76, EQU 77, EQU 78, EQU 79</td>
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<td>EQU 4: Ink Jet Printing Unit - Printing Press</td>
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<td>EQU 5: Ink Jet Printing Unit - Printing Press</td>
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<td>EQU 71, EQU 72, EQU 73, EQU 74, EQU 75, EQU 76, EQU 77, EQU 78, EQU 79</td>
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<td>EQU 6: Ink Jet Printing Unit - Printing Press</td>
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<td>EQU 71, EQU 72, EQU 73, EQU 74, EQU 75, EQU 76, EQU 77, EQU 78, EQU 79</td>
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<td>EQU 7: Ink Jet Printing Unit - Printing Press</td>
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<td>EQU 71, EQU 72, EQU 73, EQU 74, EQU 75, EQU 76, EQU 77, EQU 78, EQU 79</td>
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<td>EQU 8: Ink Jet Printing Unit - Printing Press</td>
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<td>EQU 71, EQU 72, EQU 73, EQU 74, EQU 75, EQU 76, EQU 77, EQU 78, EQU 79</td>
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<td>EQU 9: Ink Jet Printing Unit - Printing Press</td>
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<td>EQU 71, EQU 72, EQU 73, EQU 74, EQU 75, EQU 76, EQU 77, EQU 78, EQU 79</td>
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<td>EQU 10: Ink Jet Printing Unit - Printing Press</td>
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<td>EQU 15: Ink Jet Printing Unit - Printing Press</td>
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<td>EQU 17: Ink Jet Printing Unit - Printing Press</td>
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<td>EQU 18: Web Press 14 - Harris M-110C sends to STRU 9: Stack/Vent for Regenerative Thermal Oxidizer</td>
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<td>EQU 71, EQU 72, EQU 73, EQU 74, EQU 75, EQU 76, EQU 77, EQU 78, EQU 79</td>
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<td>EQU 18: Web Press 14 - Harris M-110C sends to STRU 10: Bypass Stack/Vent for EQU 18</td>
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<td>EQU 71, EQU 72, EQU 73, EQU 74, EQU 75, EQU 76, EQU 77, EQU 78, EQU 79</td>
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<td>EQU 18: Web Press 14 - Harris M-110C sends to TREA 1: Regenerative Thermal Oxidizer</td>
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<td>EQU 19: Web Press 14 Dryers - Dryer/Oven, sends to STRU 9: Stack/Vent for</td>
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<td>EQUI 19: Web Press 14Dryers - Dryer/Oven, direct fired</td>
<td>sends to</td>
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<tr>
<td>EQUI 19: Web Press 14Dryers - Dryer/Oven, direct fired</td>
<td>is controlled by</td>
<td>TREA 1: Regenerative Thermal Oxidizer</td>
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<td>EQUI 20: Web Press 3Dryers - Dryer/Oven, direct fired</td>
<td>sends to</td>
<td>STRU 2: Bypass Stack/Vent for EQU 65</td>
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<td>EQUI 20: Web Press 3Dryers - Dryer/Oven, direct fired</td>
<td>sends to</td>
<td>STRU 9: Stack/Vent for Regenerative Thermal Oxidizer</td>
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<td>EQUI 20: Web Press 3Dryers - Dryer/Oven, direct fired</td>
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<td>EQUI 21: Web Press 8Dryers - Dryer/Oven, direct fired</td>
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<td>STRU 4: Bypass Stack/Vent for EQU 66</td>
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<tr>
<td>EQUI 21: Web Press 8Dryers - Dryer/Oven, direct fired</td>
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<td>EQUI 21: Web Press 8Dryers - Dryer/Oven, direct fired</td>
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<td>EQUI 22: Web Press 9Dryers - Dryer/Oven, direct fired</td>
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<td>EQUI 22: Web Press 9Dryers - Dryer/Oven, direct fired</td>
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<td>EQUI 22: Web Press 9Dryers - Dryer/Oven, direct fired</td>
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<td>EQUI 23: Web Press 10Dryers - Dryer/Oven, direct fired</td>
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<td>EQUI 23: Web Press 10Dryers - Dryer/Oven, direct fired</td>
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<td>EQUI 24: Web Press 11Dryers - Dryer/Oven, direct fired</td>
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<td>TREA 1: Regenerative Thermal Oxidizer</td>
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<td>EQUI 26: Web Press 12Dryers - Dryer/Oven, direct fired</td>
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<td>STRU 8: Bypass Stack/Vent for EQU 70</td>
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<td>EQUI 26: Web Press 12Dryers - Dryer/Oven, direct fired</td>
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<td>EQUI 42: Web Press 2Dryers - Dryer/Oven, direct fired</td>
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<td>EQUI 42: Web Press 2Dryers - Dryer/Oven, direct fired</td>
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<td>EQUI 64: Web Press 2Harris M110C</td>
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<td>EQUI 65: Web Press 3 - Harris M120C</td>
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<td>EQUI 66: Web Press 8 - Harris M90</td>
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<td>EQUI 68: Web Press 10 - Harris M1000B</td>
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<td>EQUI 84: T.6.2 Tank 2 Upper</td>
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<td>EQUI 85: T.7.1 Tank 1 Middle Upper</td>
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<td>EQUI 86: T.7.2 Tank 2 Middle Upper</td>
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<td>EQUI 88: T.8.2 Tank 2 Middle</td>
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<td>EQUI 95: T.3.1 High Temp Limit</td>
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<td>EQUI 96: T.3.2 High Temp Limit</td>
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<td>STRU 7: Bypass Stack/Vent for EQUI 69</td>
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<td>STRU 9: Stack/Vent for Regenerative Thermal Oxidizer</td>
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5. Limits and other requirements

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<td>RR Donnelley - Chanhassen</td>
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<td>5.1.1</td>
<td>Permit Appendices: This permit contains appendices as listed in the permit Table of Contents. The Permittee shall comply with all requirements contained in Appendices:</td>
</tr>
<tr>
<td></td>
<td>-Appendix A. Insignificant Activities and General Applicable Requirements;</td>
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<td></td>
<td>-Appendix B. VOC and HAPs Calculation Methods;</td>
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<td>-Appendix C. Maximum Contents of Materials and Application Rates; and</td>
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<tr>
<td></td>
<td>-Appendix D. Thermal Oxidizer Maintenance Schedule. [Minn. R. 7007.0800, subp. 2]</td>
</tr>
<tr>
<td>5.1.2</td>
<td>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.</td>
</tr>
<tr>
<td></td>
<td>This permit shall not alter or affect the liability of the Permittee for any violation of applicable requirements prior to or at the time of permit issuance. [Minn. R. 7007.1800(A)(2)]</td>
</tr>
<tr>
<td>5.1.3</td>
<td>This permit establishes limits on the facility to keep it a minor source under New Source Review, Part 70, and Part 63. The Permittee cannot make any change at the source that would make the source a major source under New Source Review, Part 70, or Part 63 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: Avoid major modification under 40 CFR 52.21(b)(2) and Minn. R. 7007.3000, Title I Condition: Avoid major source under 40 CFR 52.21(b)(1)(i) and Minn. R. 7007.3000, Title I Condition: Avoid major source under 40 CFR 63.2, To avoid major source under 40 CFR 70.2 &amp; Minn. R. 7007.0200]</td>
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<tr>
<td>5.1.4</td>
<td>Equipment Labeling: The Permittee shall permanently affix a unique number to each emissions unit for tracking purposes. The numbers shall correlate the unit to the appropriate Subject Item numbers used in this permit. The number can be affixed by placard, stencil, or other means. The number shall be maintained so that it is readable and visible at all times from a safe distance. If equipment is added, it shall be given a new unique number; numbers from replaced or removed equipment shall not be reused. [Minn. R. 7007.0800, subp. 2]</td>
</tr>
<tr>
<td>5.1.5</td>
<td>Equipment Inventory: The Permittee shall maintain a written list of all emissions units and control equipment on site. The Permittee shall update the list to include any replaced, modified, or new equipment prior to making the change.</td>
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<td>The list shall correlate the units to the Subject Item numbers used in this permit and shall include the data on GI-04, GI-05B, GI-05C, and GI-05F. The date of construction shall be the date the change was made for replaced, modified, or new equipment. [Minn. R. 7007.0800, subp. 2]</td>
</tr>
<tr>
<td>5.1.6</td>
<td>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]</td>
</tr>
<tr>
<td>5.1.7</td>
<td>Air Pollution Control Equipment: Operate all pollution control equipment whenever the corresponding process equipment and emission units are operated. [Minn. R. 7007.0800, subp. 16(J), Minn. R. 7007.0800, subp. 2]</td>
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<tr>
<td>5.1.8</td>
<td>Operation and Maintenance Plan: Retain at the stationary source an operation and maintenance plan</td>
</tr>
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<td>Requirement number</td>
<td>Requirement and citation</td>
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<tr>
<td>5.1.16</td>
<td>Limits set as a result of a performance test (conducted before or after permit issuance) apply until superseded as stated in the MPCA's Notice of Compliance letter granting preliminary approval. Preliminary approval is based on formal review of a subsequent performance test on the same unit as specified by Minn. R. 7017.2025, subp. 3. The limit is final upon issuance of a permit amendment incorporating the change. [Minn. R. 7017.2025, subp. 3]</td>
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<tr>
<td>5.1.17</td>
<td>Monitoring Equipment Calibration - The Permittee shall either:</td>
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<td>1. Calibrate or replace required monitoring equipment every 12 months; or</td>
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<td>2. Calibrate at the frequency stated in the manufacturer's specifications.</td>
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<td>For each monitor, the Permittee shall maintain a record of all calibrations, including the date conducted, and any corrective action that resulted. The Permittee shall include the calibration frequencies, procedures, and manufacturer's specifications (if applicable) in the Operations and Maintenance Plan. Any requirements applying to continuous emission monitors are listed separately in this permit. [Minn. R. 7007.0800, subp. 4(D)]</td>
</tr>
<tr>
<td>5.1.18</td>
<td>Operation of Monitoring Equipment: Unless noted elsewhere in this permit, monitoring a process or</td>
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<tr>
<td>5.1.9</td>
<td>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]</td>
</tr>
<tr>
<td>5.1.10</td>
<td>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]</td>
</tr>
<tr>
<td>5.1.11</td>
<td>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]</td>
</tr>
<tr>
<td>5.1.12</td>
<td>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)]</td>
</tr>
<tr>
<td>5.1.13</td>
<td>The Permittee shall comply with the General Conditions listed in Minn. R. 7007.0800, subp. 16. [Minn. R. 7007.0800, subp. 16]</td>
</tr>
<tr>
<td>5.1.14</td>
<td>Performance Testing: Conduct all performance tests in accordance with Minn. R. ch. 7017 unless otherwise noted in this permit. [Minn. R. ch. 7017]</td>
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<tr>
<td>5.1.15</td>
<td>Performance Test Notifications and Submittals:</td>
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<td>Performance Test Notification and Plan: due 30 days before each Performance Test</td>
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<td>Performance Test Pre-test Meeting: due 7 days before each Performance Test</td>
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<td>Performance Test Report: due 45 days after each Performance Test</td>
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<td>The Notification, Test Plan, and Test Report must be submitted in a format specified by the commissioner. [Minn. R. 7017.2017, Minn. R. 7017.2030, subps. 1-4, Minn. R. 7017.2035, subps. 1-2]</td>
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<tr>
<td>5.1.19</td>
<td>Recordkeeping: Retain all records at the stationary source, unless otherwise specified within this permit, for 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)]</td>
</tr>
<tr>
<td>5.1.20</td>
<td>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)]</td>
</tr>
<tr>
<td>5.1.21</td>
<td>If the Permittee determines that no permit amendment or notification is required prior to making a change, the Permittee must retain records of all calculations required under Minn. R. 7007.1200. For non-expiring permits, these records shall be kept for a period of five years from the date that the change was made. The records shall be kept at the stationary source for the current calendar year of operation and may be kept at the stationary source or office of the stationary source for all other years. The records may be maintained in either electronic or paper format. [Minn. R. 7007.1200, subp. 4]</td>
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<tr>
<td>5.1.22</td>
<td>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. 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]</td>
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<tr>
<td>5.1.23</td>
<td>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. 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]</td>
</tr>
<tr>
<td>5.1.24</td>
<td>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]</td>
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<tr>
<td>5.1.25</td>
<td>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: 1. the cause of the deviation; 2. the exact dates of the period of the deviation, if the deviation has been corrected;</td>
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<td>3.</td>
<td>3. whether or not the deviation has been corrected;</td>
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<td>4.</td>
<td>4. the anticipated time by which the deviation is expected to be corrected, if not yet corrected; and</td>
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<td>5.</td>
<td>5. steps taken or planned to reduce, eliminate, and prevent reoccurrence of the deviation. [Minn. R. 7019.1000, subp. 1]</td>
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<tr>
<td>5.1.26</td>
<td>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. Upon adoption of a new or amended federal applicable requirement, and if there are 3 or more years remaining in the permit term, the Permittee shall file an application for an amendment within nine months of promulgation of the applicable requirement, pursuant to Minn. R. 7007.0400, subp. 3. [Minn. R. 7007.0400, subp. 3, Minn. R. 7007.1150 - 7007.1500]</td>
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<tr>
<td>5.1.27</td>
<td>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). Performance testing deadlines from the General Provisions of 40 CFR pt. 60 and pt. 63 are examples of deadlines for which the MPCA does not have authority to grant extensions and therefore do not meet the requirements of Minn. R. 7007.1400, subp. 1(H). [Minn. R. 7007.1400, subp. 1(H)]</td>
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<tr>
<td>5.1.28</td>
<td>Within 15 days of a request from the Commissioner, the Permittee must provide a complete summary of all performance tests required at the facility including the subject item, pollutant, most recent test date (if applicable), and the date of the next test in an approved format. [Minn. R. 7007.0800, subp. 16(L)]</td>
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<tr>
<td>5.1.29</td>
<td>Emission Inventory Report: due on or before April 1 of each calendar year following permit issuance. Submit in a format specified by the Commissioner. [Minn. R. 7019.3000-7019.3100]</td>
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<tr>
<td>5.1.30</td>
<td>Emission Fees: due 30 days after receipt of an MPCA bill. [Minn. R. 7002.0005-7002.0085]</td>
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<tr>
<td><strong>COMG 1</strong></td>
<td><strong>VOC/HAP Limit</strong></td>
</tr>
<tr>
<td>5.2.1</td>
<td>The Permittee shall limit emissions of Volatile Organic Compounds &lt;= 50 tons per year 12-month rolling sum to be calculated by the 25th day of each month for the previous 12-month period as described later in this permit. All non-combustion VOC-emitting equipment at the Facility is subject to this limit. If the Permittee replaces any existing non-combustion VOC-emitting equipment, adds new non-combustion VOC-emitting equipment, or modifies the existing equipment, such equipment is subject to this permit limit as well as all of the requirements at COMG 1. Prior to making such a change, the Permittee shall apply for and obtain the appropriate permit amendment, as applicable. The Permittee is not required to complete VOC calculations described in Minn. R. 7007.1200, subp. 2. A permit amendment will still be needed regardless of the emissions increase if the change will be subject to a new applicable requirement or requires revisions to the limits or monitoring and recordkeeping in this permit. VOC contents for each VOC-containing material shall be determined as described under the Material Content requirement in COMG 1. The calculation of VOCs used may take into account recovered/recycled VOCs as described under the Waste Credit requirement in COMG 1. [Title I Condition: Avoid major modification under 40 CFR 52.21(b)(2) and Minn. R. 7007.3000, Title I Condition: Avoid major source under 40 CFR 52.21(b)(1)(i) and Minn. R. 7007.3000, To avoid major source under 40 CFR 70.2 &amp; Minn. R. 7007.0200]</td>
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| 5.2.2              | The Permittee shall limit emissions of HAPs - Total <= 12.5 tons per year 12-month rolling sum to be calculated by the 25th day of each month for the previous 12-month period. All non-combustion HAP-emitting equipment at the Facility is covered by this limit. If the Permittee
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<td>replaces any existing non-combustion HAP-emitting equipment or adds new non-combustion HAP-emitting equipment, such equipment is subject to this permit limit as well as all of the requirements of COMG 1. Prior to making such a change, the Permittee shall apply for and obtain the appropriate permit amendment, as applicable. A permit amendment may be needed if the change will be subject to a new applicable requirement or requires revisions to limits or the monitoring and recordkeeping in this permit. HAP contents for each HAP-containing material shall be determined as described under the Material Content requirement in COMG 1. The calculation of HAPs used may take into account recovered/recycled HAPs as described under the Waste Credit requirement in COMG 1. [Title I Condition: Avoid major modification under 40 CFR 52.21(b)(2) and Minn.R. 7007.3000, Title I Condition: Avoid major source under 40 CFR 52.21(b)(1)(i) and Minn. R. 7007.3000, Title I Condition: Avoid major source under 40 CFR 63.2, To avoid major source under 40 CFR 70.2 &amp; Minn. R. 7007.0200]</td>
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<tr>
<td>5.2.3</td>
<td>The Permittee shall limit emissions of HAPs - Single &lt;= 5.0 tons per year 12-month rolling sum to be calculated by the 25th day of each month for the previous 12-month period. All non-combustion HAP-emitting equipment at the Facility is covered by this limit. If the Permittee replaces any existing non-combustion HAP-emitting equipment or adds new non-combustion HAP-emitting equipment, such equipment is subject to this permit limit as well as all of the requirements of COMG 1. Prior to making such a change, the Permittee shall apply for and obtain the appropriate permit amendment, as applicable. A permit amendment may be needed if the change will be subject to a new applicable requirement or requires revisions to limits or the monitoring and recordkeeping in this permit. HAP contents for each HAP-containing material shall be determined as described under the Material Content requirement in COMG 1. The calculation of HAPs used may take into account recovered/recycled HAPs as described under the Waste Credit requirement in COMG 1. [Title I Condition: Avoid major modification under 40 CFR 52.21(b)(2) and Minn.R. 7007.3000, Title I Condition: Avoid major source under 40 CFR 52.21(b)(1)(i) and Minn. R. 7007.3000, Title I Condition: Avoid major source under 40 CFR 63.2, To avoid major source under 40 CFR 70.2 &amp; Minn. R. 7007.0200]</td>
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| 5.2.4               | Material Usage Recordkeeping Ink materials use: Inkjet printing presses: The Permittee shall record the date on which each bulk Imaging Ink container box is opened. Heatset and Sheetfed presses: The Permittee shall record the quantity of each ink used at the facility based on purchase/delivery records of Inks. Digital sheetfed: The Permittee shall record the date on which each Electroinks bulk container box is opened and the date on which each Digital Oils bottle is opened and the bottle volume. Fountain solution, automatic blanket wash, and manual blanket wash: The Permittee shall record the amount and type of material used based on purchase/delivery records of each solvent. Parts washer: Maintenance parts washers: The Permittee shall record the date, quantity, and type of each VOC-containing material used at the facility based on service records. Digital sheetfed parts washer: the Permittee shall record the date and quantity and type of each VOC-containing material used at the facility every time VOC-containing solvent is added to the Digital sheetfed parts washer. [Title I Condition: Avoid major modification under 40 CFR 52.21(b)(2) and
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<tr>
<td>5.2.5</td>
<td>Composite VOC Vapor Pressure Records: For materials used for either automatic or manual blanket wash, the Permittee shall document if the composite VOC vapor pressure is equal to, less than, or greater than 10 mmHg at 20 degrees centigrade, for each material. If the composite VOC vapor pressure is unknown, the Permittee shall assume that it is greater than 10 mmHg in the applicable permit calculations until such time that it is determined to be otherwise. [Minn. R. 7007.0800, subps. 4-5]</td>
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<tr>
<td>5.2.6</td>
<td>Volatile Organic Compounds: Monthly Recordkeeping -- VOC Emissions. By the 25th of the month, the Permittee shall calculate and record the following: 1) The total usage of each VOC-containing material for the previous calendar month using recordkeeping described in the Material Usage Recordkeeping requirement of this permit. This record shall also include the VOC and solids contents of each material as determined by the Material Content requirement of this permit, what kind of press the ink is used at (heatset, sheetfed, inkjet presses or digital sheetfed), and the vapor pressure of wash solutions; 2) The VOC emissions for the previous month using the formulas specified in Appendix B this permit; and 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, subps. 4-5]</td>
</tr>
<tr>
<td>5.2.7</td>
<td>HAPs: Monthly Recordkeeping. By the 25th of the month, the Permittee shall calculate and record the following using the formulas specified in this permit: 1) The total of each HAP-containing material used in the previous calendar month using the recordkeeping described in the Material Usage Recordkeeping requirement of this permit. This record shall also include the individual and total HAP contents of each HAP-containing material used in the previous month, as determined by the Material Content requirement of this permit; 2) The total and individual HAP emissions for the previous month using the formulas specified in this permit; and 3) The 12-month rolling sum total and individual HAP emissions for the previous 12-month period by summing the monthly emissions data for the previous 12 months. [Minn. R. 7007.0800, subps. 4-5]</td>
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<tr>
<td>5.2.8</td>
<td>Material Content. VOC and HAPs contents in materials shall be determined by the Safety Data Sheet (SDS) or the Material Safety Data Sheet (MSDS) provided by the supplier for each material used. If a material content range is given on the SDS or the MSDS, the highest number in the range shall be used in all compliance calculations. If there is information provided in the Regulatory Section of the SDS, the highest number in the range of that section may be used. Other alternative methods approved by the MPCA may be used to determine the VOC, HAPs, and solids contents. The Commissioner reserves the right to require the Permittee to determine the VOC, HAP, and solids 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 SDS or the MSDS. [Minn. R. 7007.0800, subps. 4-5]</td>
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<tr>
<td>5.2.9</td>
<td>Waste Credit: If the Permittee elects to obtain credit for HAPs, solids, and/or VOC shipped in waste materials, the Permittee shall either use item 1 or 2 to determine the VOC, solids, and/or total and individual HAP content for each credited shipment. 1) The Permittee shall analyze a composite sample of each waste shipment to determine the weight content of VOC, solids, total HAP, and每个 individual HAP, excluding water. 2) The Permittee may use supplier data for raw materials to determine the VOC, solids, and total and individual HAP 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, solids, and total and individual HAP content of any of the materials. [Minn. R. 7007.0800, subps. 4-5]</td>
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<tr>
<td>5.2.10</td>
<td>Maximum Contents of Materials and Process Rate: The Permittee assumed certain worst-case contents of materials and process rates when determining the short term potential to emit of units in COMG 1. These assumptions are listed in Appendix C of this permit. Increasing the process rate or changing to a material that has a higher content of any of the given pollutants is considered a change in method of operation that must be evaluated under Minn. R. 7007.1200, subp. 3 to determine if a permit amendment or notification is required under Minn. R. 7007.1150. [Minn. R. 7005.0100, subp. 35a]</td>
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<tr>
<td>COMG 2</td>
<td>Direct Heating Equipment</td>
</tr>
<tr>
<td>5.3.1</td>
<td>Particulate Matter &lt;= 0.30 grains per 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)]</td>
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<td>5.3.2</td>
<td>Opacity &lt;= 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)]</td>
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<tr>
<td>5.3.3</td>
<td>Fuel type: Natural gas or propane only. [Minn. R. 7005.0100, subp. 35a]</td>
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<td>5.3.4</td>
<td>The Permittee shall keep records of fuel purchases showing fuel types. [Minn. R. 7007.0800, subp. 5]</td>
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<tr>
<td>COMG 3</td>
<td>Heat-set presses and associated dryers</td>
</tr>
<tr>
<td>5.4.1</td>
<td>The Permittee shall vent emissions from all heatset press operation units in COMG 3, including existing, modified, or new heatset presses and associate dryers, to thermal oxidizer meeting the permit requirements for TREA 1 at all times that a given press/dryer is operating. [Title I Condition: Avoid major modification under 40 CFR 52.21(b)(2) and Minn. R. 7007.3000, Title I Condition: Avoid major source under 40 CFR 52.21(b)(1)(i) and Minn. R. 7007.3000, Title I Condition: Avoid major source under 40 CFR 63.2, To avoid major source under 40 CFR 70.2 &amp; Minn. R. 7007.0200]</td>
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<tr>
<td>COMG 4</td>
<td>Industrial Process Equipment Rule</td>
</tr>
<tr>
<td>5.5.1</td>
<td>Opacity &lt;= 20 percent opacity. [Minn. R. 7011.0715, subp. 1(B)]</td>
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<tr>
<td>5.5.2</td>
<td>Particulate Matter &lt;= 0.30 grains per 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. 7011.0715, subp. 1(A)]</td>
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<tr>
<td>TREA 1</td>
<td>Regenerative Thermal Oxidizer</td>
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<tr>
<td>5.6.1</td>
<td>The Permittee shall operate and maintain control equipment such that it achieves an overall control efficiency for, HAPs &gt;= 90.0 percent control efficiency. [Title I Condition: Avoid major source under 40 CFR 52.21(b)(1)(i) and Minn. R. 7007.3000, Title I Condition: Avoid major source under 40 CFR 63.2, To avoid major source under 40 CFR 70.2 &amp; Minn. R. 7007.0200]</td>
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<tr>
<td>5.6.2</td>
<td>The Permittee shall operate and maintain control equipment such that it achieves an overall control efficiency for, Volatile Organic Compounds &gt;= 90.0 percent control efficiency. [Title I Condition: Avoid major source under 40 CFR 52.21(b)(1)(i) and Minn. R. 7007.3000, To avoid major source under 40 CFR 70.2 &amp; Minn. R. 7007.0200]</td>
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<tr>
<td>5.6.3</td>
<td>The Permittee shall vent emissions from units in COMG 3 to TREA 1 whenever any units in COMG 3 operates, and operate and maintain TREA 1 at all times that any emissions are vented to TREA 1. The Permittee shall document periods of non-operation of the control equipment TREA 1 whenever any unit in COMG 3 is operating. [Title I Condition: Avoid major source under 40 CFR 52.21(b)(1)(i) and Minn. R. 7007.3000, Title I Condition: Avoid major source under 40 CFR 63.2, To avoid major source under 40 CFR 70.2 &amp; Minn. R. 7007.0200]</td>
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<td>5.6.4</td>
<td>Temperature &gt;= 1394 degrees Fahrenheit 3-hour rolling average at the combustion chamber outlet (Minimum Temperature Limit), unless a new limit is set pursuant to Minn. R. 7017.2025, subp. 3, as detailed below. If the recorded 3-hour rolling average temperature is below the Minimum Temperature Limit, the VOC used during that time shall be considered uncontrolled until the average temperature is above the Minimum Temperature Limit. This shall be reported as a deviation. [Title I Condition: Avoid major source under 40 CFR 52.21(b)(1)(i) and Minn. R. 7007.3000, To avoid major source under 40 CFR 70.2 &amp; Minn. R. 7007.0200]</td>
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| 5.6.5               | For periods when the thermal oxidizer is operated above the minimum combustion chamber, which consists of the two media beds and the cross over chamber, temperature, the Permittee shall use either one of the following when completing calculations as required elsewhere in this permit:  
  a. The overall control efficiency limit specified in this permit for this equipment (90%); or  
  b. The 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. [Minn. R. 7007.0800, subps. 4-5, Title I Condition: Avoid major source under 40 CFR 52.21(b)(1)(i) and Minn. R. 7007.3000, Title I Condition: Avoid major source under 40 CFR 63.2, To avoid major source under 40 CFR 70.2 & Minn. R. 7007.0200] |
| 5.6.6               | If the Permittee replaces TREA 1, the replacement control must meet or exceed the control efficiency requirements of TREA 1 as well as comply with all other requirements of TREA 1. Prior to making such a change, the Permittee shall apply for and obtain the appropriate permit amendment, as applicable.  
If no amendment is needed for the replacement, the Permittee shall submit an electronic notice to the Agency using Form CR-05. The notice must be received by the Agency seven working days prior to the commencement/start of replacement. [Title I Condition: Avoid major source under 40 CFR 52.21(b)(1)(i) and Minn. R. 7007.3000, Title I Condition: Avoid major source under 40 CFR 63.2, To avoid major source under 40 CFR 70.2 & Minn. R. 7007.0200] |
| 5.6.7               | Protocol for Re-Setting the Minimum Temperature Limit: The Permittee shall conduct performance testing to measure the VOC destruction efficiency as required elsewhere in this permit. If the Minimum Temperature Limit is to be re-set, the re-set shall be based on the average temperature values recorded during the most recent MPCA-approved performance test where compliance was demonstrated. During the performance test, the Permittee must continuously monitor the temperature in the combustion chamber The Permittee shall calculate the average temperature from the combustion chamber by reducing the temperature data to an average temperature based on the average exhibited over all three compliant test runs. Downtime of 15 minutes or more is not to be included as operating time.  
The Minimum Temperature Limit shall be re-set as follows:  
- if the 3-hour average temperature recorded during the test is within 25 deg F of the limit, it shall not be re-set and the established Minimum Temperature Limit remains unchanged; or  
- if the 3-hour average temperature is more than 25 deg F greater or less than the established limit, it shall be re-set as the average temperature of the performance test. Ongoing compliance with the temperature limit will be determined using the same data acquisition and reduction as was used during the performance test.  
The new Minimum Temperature Limit determined using this Protocol shall be effective upon receipt of the Notice of Compliance letter that approves the test results and shall be incorporated into the permit when the permit is next amended. [Title I Condition: Avoid major source under 40 CFR 52.21(b)(1)(i) and Minn. R. 7007.3000, Title I Condition: Avoid major source under 40 CFR 63.2, To avoid major source under 40 CFR 70.2 & Minn. R. 7007.0200] |
<p>| 5.6.8               | The Permittee shall operate and maintain the thermal oxidizer in accordance with the Operation and Maintenance (O &amp; M) Plan. The Permittee shall keep copies of the O &amp; M Plan available onsite for use |</p>
<table>
<thead>
<tr>
<th>Requirement number</th>
<th>Requirement and citation</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.6.9</td>
<td>Temperature Monitoring: The Permittee shall maintain and operate a thermocouple monitoring device that continuously indicates and records the combustion chamber temperature of the thermal oxidizer. The monitoring device shall have a margin of error of +/- 15 degrees Fahrenheit. The recording device shall also calculate the three-hour rolling average combustion chamber temperature. Recorded values outside the range specified in this permit are considered Deviations as defined by Minn. R. 7007.0100, subp. 8a. [Minn. R. 7007.0800, subps. 4-5, Title I Condition: Avoid major source under 40 CFR 52.21(b)(1)(i) and Minn. R. 7007.3000, Title I Condition: Avoid major source under 40 CFR 63.2, To avoid major source under 40 CFR 70.2 &amp; Minn. R. 7007.0200]</td>
</tr>
<tr>
<td>5.6.10</td>
<td>Daily Monitoring: The Permittee shall physically verify the operation of the temperature recording device at least once each operating day to verify that it is working and recording properly. The Permittee shall maintain a record of the daily verifications. [Minn. R. 7007.0800, subps. 4-5, Title I Condition: Avoid major source under 40 CFR 52.21(b)(1)(i) and Minn. R. 7007.3000, Title I Condition: Avoid major source under 40 CFR 63.2, To avoid major source under 40 CFR 70.2 &amp; Minn. R. 7007.0200]</td>
</tr>
<tr>
<td>5.6.11</td>
<td>Monitoring Equipment: The Permittee shall install and maintain thermocouples to conduct temperature monitoring required by this permit. The monitoring equipment must be installed, in use, and properly maintained whenever operation of the monitored control equipment is required. [Minn. R. 7007.0800, subps. 4-5]</td>
</tr>
<tr>
<td>5.6.12</td>
<td>The Permittee shall maintain a continuous hard copy readout or computer disk file of the temperature readings and calculated three hour rolling average temperatures for the combustion chamber. [Minn. R. 7007.0800, subps. 4-5, Title I Condition: Avoid major source under 40 CFR 52.21(b)(1)(i) and Minn. R. 7007.3000, Title I Condition: Avoid major source under 40 CFR 63.2, To avoid major source under 40 CFR 70.2 &amp; Minn. R. 7007.0200]</td>
</tr>
<tr>
<td>5.6.13</td>
<td>Annual Calibration: The Permittee shall calibrate the temperature monitor at least once every 12 months and shall maintain a written record of the calibration and any action resulting from the calibration. [Minn. R. 7007.0800, subp. 14, Minn. R. 7007.0800, subp. 4, Minn. R. 7007.0800, subp. 5]</td>
</tr>
<tr>
<td>5.6.14</td>
<td>Inspections: The Permittee shall inspect the control equipment internal and external system components per the manufacturer’s recommendations listed in the Appendix D, 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. 14, Minn. R. 7007.0800, subp. 4, Minn. R. 7007.0800, subp. 5]</td>
</tr>
<tr>
<td>5.6.15</td>
<td>Annual Inspection: At least once per calendar year, the Permittee shall conduct an internal inspection of the control device that includes all operating systems of the control device. The Permittee shall maintain a written record of the inspection and any action resulting from the inspection. [Minn. R. 7007.0800, subp. 14, Minn. R. 7007.0800, subp. 4, Minn. R. 7007.0800, subp. 5]</td>
</tr>
<tr>
<td>5.6.16</td>
<td>Corrective Actions: If the temperature is below the minimum specified by this permit or if the thermal 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 &amp; M Plan for the thermal oxidizer. The Permittee shall keep a record of the type and date of any corrective action taken. [Minn. R. 7007.0800, subp. 14, Minn. R. 7007.0800, subp. 2(A), Minn. R. 7007.0800, subp. 5]</td>
</tr>
<tr>
<td>5.6.17</td>
<td>The Permittee must apply for and obtain a major permit amendment if the Permittee wishes to deviate from the Protocol for Re-setting the Minimum Temperature Limit required by this permit. [Minn. R. 7007.1500, subp. 1]</td>
</tr>
<tr>
<td>5.6.18</td>
<td>Notwithstanding the Protocol detailed above, the MPCA reserves the right to set operational limits and requirements as allowed under Minn. R. 7017.2025. If the MPCA sets limits, the new limits shall</td>
</tr>
</tbody>
</table>
### 6. Submittal/action requirements

This section lists most of the submittals required by this permit. Please note that some submittal requirements may appear in the Limits and Other Requirements section, or, if applicable, within a Compliance Schedule section.

<table>
<thead>
<tr>
<th>Requirement number</th>
<th>Requirement and citation</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>TFAC 1</strong></td>
<td>RR Donnelley - Chanhassen</td>
</tr>
<tr>
<td>6.1.1</td>
<td>The Permittee must submit a semiannual deviations report: Due semiannually, by the 30th of January and July. The first semiannual report submitted by the Permittee must 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. Submit this on form DRF-2 (Deviation Reporting Form). If no deviations have occurred, submit the signed report certifying that there were no deviations. [Minn. R. 7007.0800, subp. 6(B)(2)]</td>
</tr>
<tr>
<td>6.1.2</td>
<td>The Permittee must submit a compliance certification: Due annually, by the 31st of January (for the previous calendar year). Submit this on form CR-04 (Annual Compliance Certification Report). This report covers all deviations experienced during the calendar year. If no deviations have occurred, submit the signed report certifying that there were no deviations. [Minn. R. 7007.0800, subp. 6(D)]</td>
</tr>
<tr>
<td>6.1.3</td>
<td>The Permittee must submit an annual report by the 31st of January. The report shall describe the changes made at the Facility during the previous calendar year using the latest MPCA application forms. The report shall include information for any new, modified, or replaced Subject Items. The report shall document the VOC, Individual HAPs, and Total HAPs 12-month rolling sum calculations for the previous calendar year. The report shall be submitted with the annual Compliance Certification required by this permit. As part of the Annual Report, the Permittee shall verify and certify that the Facility has maintained minor source status for New Source Review. [Minn. R. 7007.0800, subp. 2]</td>
</tr>
<tr>
<td><strong>TREA 1</strong></td>
<td>Regenerative Thermal Oxidizer</td>
</tr>
<tr>
<td>6.2.1</td>
<td>Volatile Organic Compounds: The Permittee shall conduct a performance test due before 9/12/2021 and every 60 months thereafter to verify control efficiency of VOCs. The first test is due by the date specified above and all subsequent tests shall be completed every 60 months thereafter by the due date (month and day) and as described below. The performance test shall be conducted at worst-case conditions defined at Minn. R. 7017.2005, subp. 8 or at the operating conditions described at Minn. R. 7017.2025, subp. 2, using EPA Reference Methods 25A, or other method approved by MPCA in the performance test plan approval. Testing conducted during the 60 days prior to the performance test due date will not reset the test due date for future testing as required by this permit or within a Notice of Compliance letter. Testing conducted more than 60 days prior to the performance test due date satisfies this test due date requirement but will reset future performance test due dates based on the performance test date. [Minn. R. 7017.2020, subp. 1, Title I Condition: Avoid major source under 40 CFR 52.21(b)(1)(i) and Minn. R. 7007.3000, To avoid major source under 40 CFR 70.2 &amp; Minn. R. 7007.0200]</td>
</tr>
</tbody>
</table>
7. Appendices

Appendix A. 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.

<table>
<thead>
<tr>
<th>Minn. R.</th>
<th>Rule description of the activity</th>
<th>General applicable requirement</th>
</tr>
</thead>
</table>
| Minn. R. 7007.1300, subp. 3(F) | Individual units with potential emissions less than 2000 lb/year of certain pollutants The Permittee has 3 Baler with paper handling system, 11 space heaters with a combined capacity of 1.81 MMBtu/hr, and 32 rooftop HVAC units with a combined capacity of 8.90 MMBtu/hr. | Baler and paper handling system
PM, variable depending on airflow
Opacity \(\leq 20\%\) (Minn. R. 7011.0715) |
|         |                                                                                                 | Space heater and HVAC
PM \(\leq 0.4\) lb/MBtu
Opacity \(\leq 20\%\) with exceptions (Minn. R. 7011.0515) |
Appendix B. Emissions Calculation Equations

a. VOC Calculation Methods
The Permittee shall calculate monthly emissions using the formulas below. For inkjet and sheetfed presses (nonheatset) only, DE is zero in equation A, CA is zero in equations C and E, and the Permittee shall ignore equations C and E. 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. The determination as to the amounts of chemicals used at each press will be determined based on the number of sheets/impressions run through the corresponding press and time period.

In this document, nonheatset means inkjet and sheetfed presses and it does not include digital sheetfed presses.

\[
\text{VOC (tons)} = A + B + C + D + E + F + G + H - I
\]

\[
A = \text{VOC emissions, in tons, from ink usage (heatset and nonheatset)}
A = \left[\left(U_1 \times V_1 \times (1-R) \times (1-DE)\right) + \left(U_2 \times V_2 \times (1-R) \times (1-DE)\right) + \ldots\right]/2000
\]

\[
U_1 = \text{amount of each VOC-containing ink material used in the previous month, in pounds}
V_1 = \text{weight percent VOC in U_1, as a fraction (e.g., 10\% is 0.10), if the MSDS gives a range (e.g., 10-15\%), use the highest number in the range (e.g. 15\%).}
R = \text{weight fraction of ink material retained in product, 0.20 for heatset; 0.95 for nonheatset}
DE = \text{destruction efficiency of the applicable control system (0 for nonheatset presses)}
\]

\[
B = \text{VOC emissions, in tons, from ink usage (digital sheetfed)}
B = \left[\left(U_1 \times V_1 \times (1-R)\right) + \left(U_2 \times V_2 \times (1-R)\right) + \ldots\right]/2000
\]

\[
U_1 = \text{amount of each VOC-containing ink material that is added to digital sheetfed in the previous month, in pounds}
V_1 = \text{weight percent VOC in U_1, as a fraction (e.g., 10\% is 0.10), if the MSDS gives a range (e.g., 10-15\%), use the highest number in the range (e.g. 15\%).}
R = \text{weight fraction of ink material retained in product, 0.95 for digital sheetfed}
\]

\[
C = \text{VOC emissions, in tons, from fountain solution that is carried over to a dryer (heatset only)}
C = \left[\left(U_1 \times V_1 \times (1-DE)\right) + \left(U_2 \times V_2 \times (1-DE)\right) + \ldots\right]/2000
\]

\[
U_1 = \text{amount of each VOC-containing fountain solution used in the previous month, in pounds}
V_1 = \text{weight percent VOC in U_1, as a fraction (e.g., 10\% is 0.10) if the MSDS gives a range (e.g., 10-15\%), use the highest number in the range (e.g. 15\%).}
CA = \text{carryover of fountain solution to the dryer, 0.70}
DE = \text{destruction efficiency of the applicable control system}
\]

\[
D = \text{VOC emissions, in tons, from fountain solution usage that is not carried over to a dryer (heatset, nonheatset, and digital sheetfed)}
D = \left[\left(U_1 \times V_1 \times (1-CA)\right) + \left(U_2 \times V_2 \times (1-CA)\right) + \ldots\right]/2000
\]

\[
U_1 = \text{amount of each VOC-containing fountain solution used in the previous month, in pounds}
V_1 = \text{weight percent VOC in U_1, as a fraction (e.g., 10\% is 0.10) if the MSDS gives a range (e.g., 10-15\%), use the highest number in the range (e.g. 15\%).}
CA = \text{carryover of fountain solution to the dryer, 0.70 for heatset and 0.00 for nonheatset and digital sheetfed.}
\]
E = VOC emissions, in tons, from automatic blanket wash that is carried over to the dryer (heatset only)

\[ E = \frac{[(U1 \times V1 \times (CA)) + (U2 \times V2 \times (CA)) + \ldots]}{2000} \]

- \( U# \) = amount of each VOC-containing automatic blanket wash used in the previous month, in pounds
- \( V# \) = weight percent VOC in \( U# \), as a fraction (e.g., 10% is 0.10) if the MSDS gives a range (e.g., 10-15%), use the highest number in the range (e.g. 15%).
- \( CA \) = carryover of automatic blanket wash to the dryer. For materials that have a vapor pressure \( \leq 10 \text{ mm Hg} \), \( CA = 0.40 \), for materials that have a vapor pressure \( > 10 \text{ mm Hg} \) and for all nonheatset and digital sheetfed materials, \( CA = 0 \).
- \( DE \) = destruction efficiency of the applicable control system.

F = VOC emissions, in tons, from an automatic blanket wash that is not carried over to the dryer (heatset, nonheatset, and digital sheetfed)

\[ F = \frac{[(U1 \times V1 \times (1-CA)) + (U2 \times V2 \times (1-CA)) + \ldots]}{2000} \]

- \( U# \) = amount of each VOC-containing automatic blanket wash used in the previous month, in pounds
- \( V# \) = weight percent VOC in \( U# \), as a fraction (e.g., 10% is 0.10) if the MSDS gives a range (e.g., 10-15%), use the highest number in the range (e.g. 15%).
- \( CA \) = carryover of automatic blanket wash to the dryer. For heatset materials that have a vapor pressure \( \leq 10 \text{ mm Hg} \), \( CA = 0.40 \), for materials that have a vapor pressure \( > 10 \text{ mm Hg} \) and for all nonheatset and digital sheetfed materials, \( CA = 0 \).

G = VOC emissions, in tons, from manual wash solution (heatset, nonheatset, and digital sheetfed)

\[ G = \frac{[(U1 \times V1 \times (CA)) + (U2 \times V2 \times (CA)) + \ldots]}{2000} \]

- \( U# \) = amount of each VOC-containing manual wash solution used in the previous month, in pounds
- \( V# \) = weight percent VOC in \( U# \), as a fraction (e.g., 10% is 0.10) if the MSDS gives a range (e.g., 10-15%), use the highest number in the range (e.g. 15%).
- \( CA \) = weight fraction of wash solution remaining in rags as waste. For materials that have a vapor pressure \( \leq 10 \text{ mm Hg} \), \( CA = 0.50 \), for materials that have a vapor pressure \( > 10 \text{ mm Hg} \), \( CA = 0 \).

H = VOC emissions, in tons, from all other VOC-containing materials such as parts washer and solvent for digital sheetfed e.g. isopropyl alcohol

\[ H = \frac{[(U1 \times V1) + (U2 \times V2) + \ldots]}{2000} \]

- \( U# \) = amount of each VOC-containing material used in the previous month, in pounds
- \( V# \) = weight percent VOC in \( U# \), as a fraction (e.g., 10% is 0.10) if the MSDS gives a range (e.g., 10-15%), use the highest number in the range (e.g. 15%).

I = the amount of VOC shipped in waste, other than rags, in tons

\[ I = \frac{[(W1 \times V1) + (W2 \times V2) + \ldots]}{2000} \]

- \( W# \) = 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 (e.g., 10% is 0.10) if the MSDS gives a range (e.g., 10-15%), use the highest number in the range (e.g. 15%).

Waste may be credited at the individual variable level (e.g., A, B, C, etc.) or as a separate variable, I.
b. Total and Individual HAP Calculation Methods
The Permittee shall separately calculate the monthly emissions of each individual HAP and total HAP, using the formulas below. For inkjet and sheetfed presses (nonheatset) only, DE is zero in equation A, CA is zero in equations C and E, and the Permittee shall ignore equations B and D. If the Permittee records material usage on a volume basis, the Permittee shall also record the necessary material density or HAP contents in pounds/gallon, and perform the necessary conversions to calculate emissions in tons/month. All HAPs are volatile HAPs. The determination as to the amounts of chemicals used at each press will be determined based on the number of sheets/impressions run through the corresponding press and time period.

In this document, nonheatset means inkjet and sheetfed presses and it does not include digital sheetfed presses.

**Pollutant (tons) = A + B + C + D + E + F + G + H - I**

**Pollutant** = each individual HAP and total HAP

**A** = Pollutant emissions, in tons, from ink usage (heatset and nonheatset)

\[ A = \left[ \left( U_1 \times V_1 \times (1-R) \times (1-DE) \right) \times \left( U_2 \times V_2 \times (1-R) \times (1-DE) \right) \times \ldots \right] / 2000 \]

- \( U_1 \) = amount of each HAP-containing ink material used in the previous month, in pounds
- \( V_1 \) = weight percent of pollutant as a fraction, if the MSDS gives a range (e.g., 10-15%), use the highest number in the range
- \( R \) = weight fraction of ink material retained in product, 0.20 for heatset; 0.95 for nonheatset
- \( DE \) = destruction efficiency of the applicable control system (0 for nonheatset presses)

**B** = Pollutant emissions, in tons, from ink usage (digital sheetfed)

\[ B = \left[ \left( U_1 \times V_1 \times (1-R) \times (1-DE) \right) \times \left( U_2 \times V_2 \times (1-R) \times (1-DE) \right) \times \ldots \right] / 2000 \]

- \( U_1 \) = amount of each HAP-containing ink material used in the previous month, in pounds
- \( V_1 \) = weight percent of pollutant as a fraction, if the MSDS gives a range (e.g., 10-15%), use the highest number in the range
- \( R \) = weight fraction of ink material retained in product, 0.95 for digital sheetfed

**C** = Pollutant emissions, in tons, from fountain solution usage that is carried over to the dryer (heatset only)

\[ C = \left[ \left( U_1 \times V_1 \times (CA) \times (1-DE) \right) \times \left( U_2 \times V_2 \times (CA) \times (1-DE) \right) \times \ldots \right] / 2000 \]

- \( U_1 \) = amount of each HAP-containing fountain solution used in the previous month, in pounds
- \( V_1 \) = weight percent of pollutant as a fraction, if the MSDS gives a range (e.g., 10-15%), use the highest number in the range
- \( CA \) = carryover of fountain solution to the dryer, 0.70
- \( DE \) = destruction efficiency of the applicable control system

**D** = Pollutant emissions, in tons, from fountain solution usage that is not carried over to the dryer (heatset, nonheatset, and digital sheetfed)

\[ D = \left[ \left( U_1 \times V_1 \times (1-CA) \right) + \left( U_2 \times V_2 \times (1-CA) \right) + \ldots \right] / 2000 \]

- \( U_1 \) = amount of each HAP-containing fountain solution used in the previous month, in pounds
- \( V_1 \) = weight percent of pollutant as a fraction, if the MSDS gives a range (e.g., 10-15%), use the highest number in the range
- \( CA \) = carryover of fountain solution to the dryer, 0.70 for heatset and 0.00 for nonheatset and digital sheetfed
E = Pollutant emissions, in tons, from automatic blanket wash that is carried over to the dryer (heatset only)
E = [(U1 x V1 x (CA) x (1-DE)) + (U2 x V2 x (CA) x (1-DE)) + ....]/2000
  U# = amount of each HAP-containing automatic blanket wash used in the previous month, in pounds
  V# = weight percent of pollutant in U#, as a fraction (e.g., 10 % is 0.10), if the MSDS gives a range (e.g., 10-15%), use the highest number in the range (e.g. 15%)
  CA = carryover of automatic blanket wash to the dryer. For materials that have a vapor pressure ≤ 10 mm Hg, CA = 0.40, for materials that have a vapor pressure > 10 mm Hg, CA = 0.
  DE = destruction efficiency of the applicable control system.

F = Pollutant emissions, in tons, from an automatic blanket wash that is not carried over to the dryer (heatset, nonheatset, and digital sheetfed)
F = [(U1 x V1 x (1-CA)) + (U2 x V2 x (1-CA)) + ....]/2000
  U# = amount of each HAP-containing automatic blanket wash used in the previous month, in pounds
  V# = weight percent of pollutant in U#, as a fraction (e.g., 10 % is 0.10), if the MSDS gives a range (e.g., 10-15%), use the highest number in the range (e.g. 15%)
  CA = carryover of automatic blanket wash to the dryer. For heatset materials that have a vapor pressure ≤ 10 mm Hg, CA = 0.40, for materials that have a vapor pressure > 10 mm Hg and for all nonheatset materials, CA = 0.

G = Pollutant emissions, in tons, from manual wash solution (heatset, nonheatset, and digital sheetfed)
G = [(U1 x V1 x (CA)) + (U2 x V2 x (CA)) + ....]/2000
  U# = amount of each HAP-containing manual wash solution used in the previous month, in pounds
  V# = weight percent of pollutant in U#, as a fraction (e.g., 10 % is 0.10), if the MSDS gives a range (e.g., 10-15%), use the highest number in the range (e.g. 15%)
  CA = weight fraction of wash solution remaining in rags as waste. For materials that have a vapor pressure ≤ 10 mm Hg, CA = 0.50, for materials that have a vapor pressure > 10 mm Hg, CA = 0.

H = Pollutant emissions, in tons, from all other HAP-containing materials such as parts washer and solvent for digital sheetfed
H = [(U1 x V1) + (U2 x V2) + ....]/2000
  U# = amount of each HAP-containing material used in the previous month, in pounds
  V# = weight percent of pollutant in U#, as a fraction (e.g., 10 % is 0.10), if the MSDS gives a range (e.g., 10-15%), use the highest number in the range (e.g. 15%)

I = the amount of the specific HAP shipped in waste, other than rags, in tons
I = [(W1 x V1) + (W2 x V2) + ....]/2000
  W# = amount, in pounds, of each HAP-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 of pollutant in U#, as a fraction (e.g., 10 % is 0.10), if the MSDS gives a range (e.g., 10-15%), use the highest number in the range (e.g. 15%)

Waste may be credited at the individual variable level (e.g., A, B, C, etc.) or as a separate variable, I.
Appendix C: Maximum Contents of Materials and Process Rate

The table below gives the maximum materials contents and maximum materials usage rates.

**Table C.1: Printer ink Material Contents and Usage**

<table>
<thead>
<tr>
<th>Emission Unit</th>
<th>Max Materials Content (%VOC)</th>
<th>Max Ink Usage (lb/hr)</th>
</tr>
</thead>
<tbody>
<tr>
<td>EQUI 18 (Heatset Press)</td>
<td>60</td>
<td>107.6</td>
</tr>
<tr>
<td>EQUI 64 (Heatset Press)</td>
<td>60</td>
<td>107.6</td>
</tr>
<tr>
<td>EQUI 65 (Heatset Press)</td>
<td>60</td>
<td>107.6</td>
</tr>
<tr>
<td>EQUI 66 (Heatset Press)</td>
<td>60</td>
<td>107.6</td>
</tr>
<tr>
<td>EQUI 67 (Heatset Press)</td>
<td>60</td>
<td>107.6</td>
</tr>
<tr>
<td>EQUI 68 (Heatset Press)</td>
<td>60</td>
<td>107.6</td>
</tr>
<tr>
<td>EQUI 69 (Heatset Press)</td>
<td>60</td>
<td>107.6</td>
</tr>
<tr>
<td>EQUI 70 (Heatset Press)</td>
<td>60</td>
<td>107.6</td>
</tr>
<tr>
<td>EQUI 71 (Sheetfed Press)</td>
<td>50</td>
<td>8.32</td>
</tr>
<tr>
<td>EQUI 72 (Sheetfed Press)</td>
<td>50</td>
<td>8.32</td>
</tr>
<tr>
<td>EQUI 73 (Sheetfed Press)</td>
<td>50</td>
<td>8.32</td>
</tr>
<tr>
<td>EQUI 78 (Sheetfed Press)</td>
<td>50</td>
<td>8.32</td>
</tr>
<tr>
<td>EQUI 79 (Digital sheetfed)</td>
<td>78.8</td>
<td>8.72</td>
</tr>
</tbody>
</table>

**Table C.2: Fountain and Press Washer Material Contents and Usage**

<table>
<thead>
<tr>
<th>Solution</th>
<th>Max Materials Content (%VOC)</th>
<th>Max Ink Usage (lb/yr)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heatset Fountain solution</td>
<td>30</td>
<td>9240</td>
</tr>
<tr>
<td>Heatset Auto Cleaner</td>
<td>100</td>
<td>12,920</td>
</tr>
<tr>
<td>Heatset Manual Cleaner</td>
<td>100</td>
<td>5,865</td>
</tr>
<tr>
<td>Sheetfed Coating</td>
<td>100</td>
<td>273,922</td>
</tr>
<tr>
<td>Sheetfed Fountain Solution</td>
<td>100</td>
<td>3,465</td>
</tr>
<tr>
<td>Sheetfed Manual Cleaner</td>
<td>100</td>
<td>6,625</td>
</tr>
<tr>
<td>Isopropyl Alcohol</td>
<td>100</td>
<td>335</td>
</tr>
</tbody>
</table>
## Appendix D: Maintenance schedule

### MAINTENANCE SCHEDULE

<table>
<thead>
<tr>
<th>Maintenance Item</th>
<th>Monthly</th>
<th>Yearly</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bearing Lubrication</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Perform external walk around unit to check for hot spots, unusual noise, vibration, or damage.</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Inspect UV Scanner</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Test interlocks</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Check ignition spark plug</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Check valve motors</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Test flame safeguard</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Inspect poppet valve blade</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Inspect poppet valve seat assy.</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Verify proper blade to seat connection</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Test manual gas valves operation</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Check air / gas ratio</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Inspect Fan Belts</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Test pressure switches</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Visually check ignition cable and conn.</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Inspect piping for leaks</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Inspect burner components</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Clean orifice plate</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Inspect motor</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Inspect fan shaft</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Inspect fan support structure</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Inspect fan wheel</td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Manufacturer to Inspect (recommended)</td>
<td>X</td>
<td></td>
</tr>
</tbody>
</table>