

AIR EMISSION PERMIT NO. 05300061-002

Major Amendment

IS ISSUED TO

Allina Health System

**ABBOTT NORTHWESTERN HOSPITAL**

800 28<sup>th</sup> Street East

Minneapolis, Hennepin County, Minnesota, 55407

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

This permit amendment supersedes Air Emission Permit No. 05300061-002 and authorizes the Permittee to operate and modify 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 as defined in the state air pollution control rules unless the term is explicitly defined in the permit.

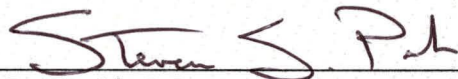
Unless otherwise indicated, all the Minnesota rules cited as the origin of the permit terms are incorporated into the State Implementation Plan (SIP) under 40 CFR § 52.1220 and as such are enforceable by U.S. Environmental Protection Agency (EPA) Administrator or citizens under the Clean Air Act.

**Permit Type:** State; Limits to Avoid Part 70/Limits to Avoid NSR; True Minor for NSR

**Operating Permit Issue Date:** December 15, 2005

**Major Amendment Issue Date:** February 21, 2013

**Expiration Date:** Nonexpiring – Title I Conditions do not expire.

for   
Don Smith, P.E., Manager  
Air Quality Permits Section  
Industrial Division

for John Linc Stine  
Commissioner  
Minnesota Pollution Control Agency

**Permit Applications Table**

<b>Permit Type</b>	<b>Application Date</b>	<b>Permit Action</b>
Total Facility Operating Permit	December 7, 1995 and April 24, 2002	001
Major Amendment	November 30, 2012	002

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**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:**

Abbott Northwestern Hospital (Abbott) is owned by Allina Health System and includes the hospital and associated laboratories and diagnostic centers.

Emissions units at Abbott include boilers and emergency generators. Pollutants of concern include products of combustion such as nitrogen oxides, carbon monoxide, particulate matter, particulate matter less than 10 microns, particulate matter less than 2.5 microns. The permit contains operating limits on natural gas and fuel oil usage for the Group 1 (GP001) boilers and on Number 2 fuel oil usage for the GP003 boilers. The emergency generators (GP002 and EU027) are limited to 300 hours per year.

**AMENDMENT DESCRIPTION:**

Permit Action 002 authorizes a fuel change for the Group 1 boilers from Number 6 fuel oil to Number 2 fuel oil. Additionally, requirements for the natural gas boilers (GP004) and the emergency generator (EU027) associated with the lab in the 10<sup>th</sup> avenue Building are being added to the permit through this permit action. GP002 now includes emergency generators, except for EU027. GP005 is the ethylene oxide sterilizers and related control equipment (CE001).



**TABLE A: LIMITS AND OTHER REQUIREMENTS**

A-1 02/25/13

Facility Name: Abbott Northwestern Hospital

Permit Number: 05300061 - 002

**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**

<b>What to do</b>	<b>Why to do it</b>
Permit Appendices: This permit contains appendices as listed in the permit Table of Contents.  The Permittee shall comply with all requirements contained in Appendix I: Insignificant Activities and Applicable Requirements.  Modeling parameters in Appendix II:Emission Rates and Exhaust Parameters Used for Modeling are included for reference only.	Minn. R. 7007.0800, subp. 2
The parameters used in NO <sub>2</sub> , PM <sub>10</sub> , PM <sub>2.5</sub> , CO, Lead, and SO <sub>2</sub> modeling for permit number 05300061-002 are listed in Appendix II of this permit. The parameters describe the operation of the facility at maximum permitted capacity. The purpose of listing the parameters in the appendix is to provide a benchmark for future changes.	Minn. Stat. Section 116.07, subd. 4a; Minn. R. 7007.0800, subps. 1, 2 & 4
<b>OPERATIONAL REQUIREMENTS</b>	hdr
The Permittee shall comply with National Primary and Secondary Ambient Air Quality Standards, 40 CFR pt. 50, and the Minnesota Ambient Air Quality Standards, Minn. R. 7009.0010 to 7009.0080. Compliance shall be demonstrated upon written request by the MPCA.	40 CFR pt. 50; Minn. Stat. Section 116.07, subds. 4a & 9; Minn. R. 7007.0100, subp. 7(A), 7(L), & 7(M); Minn. R. 7007.0800, subps. 1, 2 & 4; Minn. R. 7009.0010-7009.0080
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.	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 control practices and shall include a preventative maintenance program for the equipment and practices, a description of (the minimum but not necessarily the only) corrective actions to be taken to restore the equipment and practices 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 practices, and the records kept to demonstrate plan implementation.	Minn. R. 7007.0800, subps. 14 and 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
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
<b>MONITORING REQUIREMENTS</b>	hdr
Monitoring Equipment Calibration: The Permittee shall calibrate all required monitoring equipment at least once every 12 months (any requirements applying to continuous emission monitors are listed separately in this permit).	Minn. R. 7007.0800, subp. 4(D)

**TABLE A: LIMITS AND OTHER REQUIREMENTS****A-2**

02/25/13

Facility Name: Abbott Northwestern Hospital

Permit Number: 05300061 - 002

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
Recordkeeping: Retain all records at the stationary source, unless otherwise specified within this permit, 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)
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 nonexpiring 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
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.  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
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
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: 1. the cause of the deviation; 2. the exact dates of the period of the deviation, if the deviation has been corrected; 3. whether or not the deviation has been corrected; 4. the anticipated time by which the deviation is expected to be corrected, if not yet corrected; and 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 - 7007.1500

**TABLE A: LIMITS AND OTHER REQUIREMENTS****A-3**

02/25/13

Facility Name: Abbott Northwestern Hospital

Permit Number: 05300061 - 002

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)
Emission Inventory Report: due on or before April 1 of each calendar year following permit issuance, to be submitted on a form approved by the Commissioner.	Minn. R. 7019.3000 - 7019.3100
Emission Fees: due 60 days after receipt of an MPCA bill.	Minn. R. 7002.0005 - 7002.0095

**TABLE A: LIMITS AND OTHER REQUIREMENTS**

A-4 02/25/13

Facility Name: Abbott Northwestern Hospital

Permit Number: 05300061 - 002

**Subject Item: GP 001 Main Campus Natural Gas/No. 2 Fuel Oil Boilers (EU001-EU004)****Associated Items:** EU 001 Package Watertube Boiler 1

EU 002 Package Watertube Boiler 2

EU 003 Package Watertube Boiler 3

EU 004 Package Watertube Boiler 4

What to do	Why to do it
Emission limits apply to each emission unit individually	hdr
Total Particulate Matter: less than or equal to 0.4 lbs/million Btu heat input	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% opacity.	Minn. R. 7011.0510, subp. 2
Permitted Fuels: Natural gas and No. 2 residual fuel oil with a sulfur content not exceeding 0.0015% by weight.	Title I Condition: To avoid classification as major source under 40 CFR Section 52.21 and Minn. R. 7007.3000; To avoid major source classification under 40 CFR Section 70.2 and Minn. R. 7007.0200; Minn. R. 7005.0100, subp. 35a
Fuel Usage: less than or equal to 525 million cubic feet/year natural gas using 12-month Rolling Sum.	Title I Condition: To avoid classification as major source under 40 CFR Section 52.21 and Minn. R. 7007.3000; To avoid major source classification under 40 CFR Section 70.2 and Minn. R. 7007.0200
Fuel Usage: less than or equal to 755,000 gallons/year using 12-month Rolling Sum of No. 2 fuel oil using 12-month Rolling Sum.	Title I Condition: To avoid classification as major source under 40 CFR Section 52.21 and Minn. R. 7007.3000; To avoid major source classification under 40 CFR Section 70.2 and Minn. R. 7007.0200
Monthly Natural Gas Recordkeeping:  By the third Tuesday of each month, the Permittee shall calculate and record the following: 1) The total natural gas usage for the previous calendar month. 2) The 12-month rolling sum natural gas usage for the previous 12-month period by summing the monthly natural gas usage data for the previous 12 months.	Minn. R. 7007.0800, subps. 4 and 5
Monthly No. 2 Fuel Oil Recordkeeping:  By the third Tuesday of each month, the Permittee shall calculate and record for each boiler in GP001 the following: 1) The total No. 2 fuel oil usage for the previous calendar month. 2) The 12-month rolling sum No. 2 fuel oil usage for the previous 12-month period by summing the monthly No. 2 usage data for the previous 12 months.	Minn. R. 7007.0800, subps. 4 and 5
Fuel Supplier Certification: The Permittee shall obtain and maintain a fuel supplier certification for each shipment of No. 2 fuel oil, certifying that the sulfur content does not exceed 0.0015% by weight.	Minn. R. 7007.0800, subps. 4 and 5
Requirements under 40 CFR pt. 63, Subpart JJJJJJ: National Emission Standards for Hazardous Air Pollutants for Industrial, Commercial and Institutional Boilers Area Sources  Enforcement not delegated to MPCA.	hdr
OPERATIONAL REQUIREMENTS	hdr
The Permittee shall comply with the requirement to conduct an energy assessment no later than March 21, 2014.	40 CFR Section 63.11196(a)(3)
The Permittee shall comply with the requirement to conduct a tune-up according to 40 CFR Section 63.11223(b); no later than March 21, 2012, or a later date as determined by EPA rulemaking to amend Subpart JJJJJJ.	40 CFR Section 63.11196(a)(1)
At all times the Permittee must operate and maintain affected boilers, including associated air pollution control equipment and monitoring equipment, in a manner consistent with safety and good air pollution control practices for minimizing emissions. Determination of whether such operation and maintenance procedures are being used will be based on information available to the Administrator that may include, but is not limited to, monitoring results, review of operation and maintenance procedures, review of operation and maintenance records, and inspection of the source.	40 CFR Section 63.11205(a)

**TABLE A: LIMITS AND OTHER REQUIREMENTS****A-5** 02/25/13

Facility Name: Abbott Northwestern Hospital

Permit Number: 05300061 - 002

The Permittee shall demonstrate initial compliance with each applicable work practice standard, management practice, or emission reduction measure no later than March 21, 2014 and according to the applicable provisions in 40 CFR Section 63.7(a)(2).	40 CFR Section 63.11210(c)
<p>The Permittee must have a one-time energy assessment performed by a qualified energy assessor. An energy assessment completed on or after January 1, 2008, that meets or is amended to meet the energy assessment requirements in this table satisfies the energy assessment requirement. The energy assessment must include</p> <p>(1) A visual inspection of the boiler system,</p> <p>(2) An evaluation of operating characteristics of the facility, specifications of energy using systems, operating and maintenance procedures, and unusual operating constraints,</p> <p>(continued below)</p>	40 CFR 63.11201(b); 40 CFR Section 63, subp. JJJJJJ, Table 2
<p>(continued)</p> <p>(3) Inventory of major systems consuming energy from affected boiler(s),</p> <p>(4) A review of available architectural and engineering plans, facility operation and maintenance procedures and logs, and fuel usage,</p> <p>(5) A list of major energy conservation measures,</p> <p>(6) A list of the energy savings potential of the energy conservation measures identified,</p> <p>(7) A comprehensive report detailing the ways to improve efficiency, the cost of specific improvements, benefits, and the time frame for recouping those investments.</p>	40 CFR 63.11201(b); 40 CFR Section 63, subp. JJJJJJ, Table 2
The Permittee must conduct a tune-up for each boiler biennially and keep records as required in 40 CFR Section 63.11225(c) to demonstrate continuous compliance. Each biennial tune-up must be conducted no more than 25 months after the previous tune-up.	40 CFR Section 63.11201(b); 40 CFR Section 63.11223(a); 40 CFR Section 63, subp. JJJJJJ, Table 2
<p>The Permittee must conduct a tune-up of the boiler biennially to demonstrate continuous compliance as specified in (1) through (7) as follows:</p> <p>(1) As applicable, inspect the burner, and clean or replace any components of the burner as necessary (you may delay the burner inspection until the next scheduled unit shutdown, but you must inspect each burner at least once every 36 months).</p> <p>(2) Inspect the flame pattern, as applicable, and adjust the burner as necessary to optimize the flame pattern. The adjustment should be consistent with the manufacturer's specifications, if available.</p> <p>(3) Inspect the system controlling the air-to-fuel ratio, as applicable, and ensure that it is correctly calibrated and functioning properly.</p> <p>(4) Optimize total emissions of carbon monoxide. This optimization should be consistent with the manufacturer's specifications, if available.</p> <p>(continued below)</p>	40 CFR Section 63.11223(b)
<p>(continued)</p> <p>(5) Measure the concentrations in the effluent stream of carbon monoxide in parts per million, by volume, and oxygen in volume percent, before and after the adjustments are made (measurements may be either on a dry or wet basis, as long as it is the same basis before and after the adjustments are made).</p> <p>(6) Maintain onsite and submit, if requested by the Administrator, biennial report containing the information in (6)(i) through (iii) below:</p> <p>(i) The concentrations of CO in the effluent stream in parts per million, by volume, and oxygen in volume percent, measured before and after the tune-up of the boiler.</p> <p>(ii) A description of any corrective actions taken as a part of the tune-up of the boiler.</p> <p>(iii) The type and amount of fuel used over the 12 months prior to the biennial tune-up of the boiler.</p> <p>(7) If the unit is not operating on the required date for a tune-up, the tune-up must be conducted within one week of startup.</p>	40 CFR Section 63.11223(b)

**TABLE A: LIMITS AND OTHER REQUIREMENTS****A-6** 02/25/13

Facility Name: Abbott Northwestern Hospital

Permit Number: 05300061 - 002

The Permittee must comply with the General Provisions as applicable in Table 8 of 40 CFR pt. 63, subp. JJJJJJ.	40 CFR Section 63.11235; 40 CFR pt. 63 subp. JJJJJJ, Table 8
<b>RECORDKEEPING</b>	hdr
<p>The Permittee must maintain the following records:</p> <p>(1) A copy of each notification and report that was submitted to comply with subpart JJJJJJ, including all documentation supporting any Initial Notification or Notification of Compliance Status that was submitted, according to the requirements in 40 CFR Section 63.10(b)(2)(xiv);</p> <p>(2) Records to document conformance with the work practices, emission reduction measures, and management practices required by 40 CFR Section 63.11214 as specified as follows:</p> <p>(i) Records must identify each boiler, the date of tune-up, the procedures followed for tune-up, and the manufacturer's specifications to which the boiler was tuned.</p> <p>(ii) Records documenting the fuel type(s) used monthly by each boiler, including, but not limited to, a description of the fuel and the total fuel usage amount with units of measure.</p> <p>(continued below) (continued below)</p>	40 CFR Section 63.11225(c)
<p>(continued)</p> <p>(3) Records of the occurrence and duration of each malfunction of each boiler or of the associated air pollution control and monitoring equipment.</p> <p>(4) Records of actions taken during periods of malfunction to minimize emissions in accordance with the general duty to minimize emissions in 40 CFR Section 63.11205(a), including corrective actions to restore the malfunctioning boiler, air pollution control, or monitoring equipment to its normal or usual manner of operation.</p> <p>(continued below)</p>	40 CFR Section 63.11225(c)
<p>(continued)</p> <p>(5) The Permittee must maintain records of all inspection and monitoring data as required by 40 CFR Sections 63.11221 and 63.11222, and the information identified below for each required inspection or monitoring:</p> <p>(i) The date, place, and time of the monitoring event;</p> <p>(ii) Person conducting the monitoring.</p> <p>(iii) Technique or method used;</p> <p>(iv) Operating conditions during the activity;</p> <p>(v) Results, including the date, time, and duration of the period from the time the monitoring indicated a problem to the time that monitoring indicated proper operation; (vi) Maintenance or corrective action taken (if applicable).</p>	40 CFR Section 63.11225(c)
Records must be in a form suitable and readily available for expeditious review, according to 40 CFR Section 63.10(b)(1). The Permittee must keep each record for 5 years following the date of each recorded action. The Permittee must keep each record onsite for at least 2 years after the date of each recorded action according to 40 CFR Section 63.10(b)(1). The Permittee may keep the records off site for the remaining 3 years.	40 CFR Section 63.11225(d)
<b>REPORTING AND NOTIFICATION REQUIREMENTS</b>	hdr
<p>The Permittee must prepare by March 1 of each year, and submit to the Administrator upon request, an annual compliance certification report. The Permittee must submit the annual compliance report if the Permittee had any instance described by item 3 below. The annual compliance certification report for the previous calendar year must contain the information the following.</p> <p>(1) Company name and address</p> <p>(2) Statement by a responsible official, with the official's name, title, phone number, e-mail address, and signature, certifying the truth, accuracy, and completeness of the notification and a statement of whether the source has complied with all the relevant standards and other requirements of Subpart JJJJJJ.</p> <p>(3) Include a description of deviations from the applicable requirements during the reporting period, the time periods during which the deviations occurred, and the corrective actions taken.</p>	40 CFR Sections 63.11225(b)

**TABLE A: LIMITS AND OTHER REQUIREMENTS****A-7** 02/25/13

Facility Name: Abbott Northwestern Hospital

Permit Number: 05300061 - 002

<p>The Permittee must submit the Notification of Compliance Status in accordance with 40 CFR Section 63.9(h) no later than 120 days after the applicable compliance date specified in 40 CFR Section 63.11196. In addition to the information required in 40 CFR Section 63.9(h), the notification must include the following certifications of compliance, as applicable and signed by a responsible official:</p> <p>(1) <input type="checkbox"/> This facility complies with the requirements in 40 CFR Section 63.11214 to conduct an initial tune-up of the boiler.<input type="checkbox"/></p> <p>(2) <input type="checkbox"/> This facility has had an energy assessment performed according to 40 CFR Section 63.11214(c).<input type="checkbox"/></p>	40 CFR Section 63.11225(a)(4)
<p>The Permittee must submit a signed certification in the Notification of Compliance Status report that an energy assessment of the boiler and its energy use systems was completed and submit, upon request, the energy assessment report.</p>	40 CFR Section 63.11214(c)
<p>The Permittee must conduct a performance tune-up according to 40 CFR pt. 63.11223(b) and submit a signed statement in the Notification of Compliance Status report that indicates that the Permittee conducted a tune-up of the boiler.</p>	40 CFR Section 63.11214(b)
<p>The Permittee must submit all of the notifications in 40 CFR Sections 63.7(b); 63.8(e) and (f); 63.9(b) through (e); and 63.9(g) and (h) that apply by the dates specified in those sections.</p>	40 CFR Section 63.11225(a)(1)

**TABLE A: LIMITS AND OTHER REQUIREMENTS****A-8**

02/25/13

Facility Name: Abbott Northwestern Hospital

Permit Number: 05300061 - 002

**Subject Item: GP 002 Emergency Generators 1-10**

**Associated Items:** EU 005 Reciprocating Engine Generator 1  
 EU 006 Reciprocating Engine Generator 2  
 EU 007 Reciprocating Engine Generator 3  
 EU 008 Reciprocating Engine Generator 4  
 EU 009 Reciprocating Engine Generator 5  
 EU 010 Reciprocating Engine Generator 6  
 EU 015 Reciprocating Engine Generator 7  
 EU 016 Reciprocating Engine Generator 8  
 EU 017 Reciprocating Engine Generator 9  
 EU 018 Reciprocating Engine Generator 10

What to do	Why to do it
These requirements apply to each GP002 emergency generator individually.	hdr
Opacity: less than or equal to 20 percent opacity once operating temperature have been obtained.	Minn. R. 7011.2300, subp. 1
Sulfur Dioxide: less than or equal to 0.5 lbs/million Btu heat input .  The potential to emit from each GP002 unit is less than 0.002 lb/MMBtu due to equipment design and allowable fuels.	Minn. R. 7011.2300, subp. 2
Permitted Fuel: No. 2 fuel oil with a sulfur content not exceeding 0.0015% by weight.	Title I Condition: To avoid classification as major source under 40 CFR Section 52.21 and Minn. R. 7007.3000; To avoid major source classification under 40 CFR Section 70.2 and Minn. R. 7007.0200
Operating Hours: less than or equal to 300 hours/year using 12-month Rolling Sum for each generator.	Title I Condition: To avoid classification as major source under 40 CFR Section 52.21 and Minn. R. 7007.3000; To avoid major source classification under 40 CFR Section 70.2 and Minn. R. 7007.0200
The Permittee shall keep records of fuel type and hourly usage on a monthly basis.	Minn. R. 7007.0800, subps. 4 and 5
Fuel Supplier Certification: The Permittee shall obtain and maintain a fuel supplier certification for each shipment of No. 2 fuel oil, certifying that the sulfur content does not exceed 0.0015% by weight.	Minn. R. 7007.0800, subps. 4 and 5
During every monthly test of each emergency generator, record the following information: 1) the date, 2) the time the test was started, and 3) the time the test was completed.	Minn. R. 7007.0800, subps. 4 and 5
After May 13, 2012, the compliance date for 40 CFR pt. 63, subp. ZZZZ, the Permittee shall maintain records to document that each GP002 unit meets the criteria for stationary RICE subject to limited requirements in 40 CFR Section 63.6590(b)(3)(viii) and the definition of emergency stationary RICE under 40 CFR Section 63.6675.	40 CFR Section 63.6590 (b)(3)(viii); 40 CFR Section 63.6675; Minn. R. 7007.0800, subp. 2



**TABLE A: LIMITS AND OTHER REQUIREMENTS****A-9** 02/25/13

Facility Name: Abbott Northwestern Hospital

Permit Number: 05300061 - 002

**Subject Item:** GP 003 Heart Hospital Natural Gas/No. 2 Fuel Oil Boilers (EU011-EU014)**Associated Items:** EU 011 Flexible Watertube Boiler 5

EU 012 Flexible Watertube Boiler 6

EU 013 Flexible Watertube Boiler 7

EU 014 Flexible Watertube Boiler 8

What to do	Why to do it
Emission limits apply to each emission unit individually	hdr
Total Particulate Matter: less than or equal to 0.4 lbs/million Btu heat input	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% opacity.	Minn. R. 7011.0510, subp. 2
Permitted Fuels: Natural gas and No. 2 fuel oil with a sulfur content not exceeding 0.015% by weight.	Title I Condition: To avoid classification as major source under 40 CFR Section 52.21 and Minn. R. 7007.3000; To avoid major source classification under 40 CFR Section 70.2 and Minn. R. 7007.0200; Minn. R. 7005.0100, subp. 35a
Fuel Usage: less than or equal to 137,000 gallons/year of No. 2 distillate fuel oil, calculated monthly as a 12-month Rolling Sum.	Title I Condition: To avoid classification as major source under 40 CFR Section 52.21 and Minn. R. 7007.3000; To avoid major source classification under 40 CFR Section 70.2 and Minn. R. 7007.0200
Monthly No. 2 Fuel Oil Recordkeeping:  By the third Tuesday of each month, the Permittee shall calculate and record the following: 1) The total No. 2 fuel oil usage during the previous month (in gallons), and  2) The 12-month rolling sum No. 2 fuel oil usage (in gallons) for the previous 12-month period by summing the monthly No. 2 fuel oil usage data for the previous 12 months.	Minn. R. 7007.0800, subps. 4 and 5
Fuel Supplier Certification: The Permittee shall obtain and maintain a fuel supplier certification for each shipment of No. 2 fuel oil, certifying that the sulfur content does not exceed 0.0015% by weight.	Minn. R. 7007.0800, subps. 4 and 5
Requirements under 40 CFR pt. 63, Subpart JJJJJJ: National Emission Standards for Hazardous Air Pollutants for Industrial, Commercial and Institutional Boilers Area Sources  Enforcement not delegated to MPCA.	hdr
<b>OPERATIONAL REQUIREMENTS</b>	hdr
The Permittee shall comply with the requirement to conduct a tune-up according to 40 CFR Section 63.11223(b); no later than March 21, 2012, or a later date as determined by EPA rulemaking to amend Subpart JJJJJJ.	40 CFR Section 63.11196(a)(1)
At all times the Permittee must operate and maintain affected boilers, including associated air pollution control equipment and monitoring equipment, in a manner consistent with safety and good air pollution control practices for minimizing emissions. Determination of whether such operation and maintenance procedures are being used will be based on information available to the Administrator that may include, but is not limited to, monitoring results, review of operation and maintenance procedures, review of operation and maintenances records, and inspection of the source.	40 CFR Section 63.11205(a)
The Permittee must demonstrate initial compliance with each applicable work practice standard, management practice, or emission reduction measure no later than March 21, 2014 and according to the applicable provisions in 40 CFR Section 63.7(a)(2).	40 CFR Section 63.11210(c)
The Permittee must conduct a tune-up for each boiler biennially and keep records as required in 40 CFR Section 63.11225(c) to demonstrate continuous compliance. Each biennial tune-up must be conducted no more than 25 months after the previous tune-up.	40 CFR Section 63.11201(b); 40 CFR Section 63.11223(a); 40 CFR Section 63, subp. JJJJJJ, Table 2

**TABLE A: LIMITS AND OTHER REQUIREMENTS****A-10****02/25/13**

Facility Name: Abbott Northwestern Hospital

Permit Number: 05300061 - 002

<p>The Permittee must conduct a tune-up of the boiler biennially to demonstrate continuous compliance as specified in (1) through (7) as follows:</p> <p>(1) As applicable, inspect the burner, and clean or replace any components of the burner as necessary (you may delay the burner inspection until the next scheduled unit shutdown, but you must inspect each burner at least once every 36 months).</p> <p>(2) Inspect the flame pattern, as applicable, and adjust the burner as necessary to optimize the flame pattern. The adjustment should be consistent with the manufacturer's specifications, if available.</p> <p>(3) Inspect the system controlling the air-to-fuel ratio, as applicable, and ensure that it is correctly calibrated and functioning properly.</p> <p>(4) Optimize total emissions of carbon monoxide. This optimization should be consistent with the manufacturer's specifications, if available.</p> <p>(continued below)</p>	40 CFR Section 63.11223(b)
<p>(continued)</p> <p>(5) Measure the concentrations in the effluent stream of carbon monoxide in parts per million, by volume, and oxygen in volume percent, before and after the adjustments are made (measurements may be either on a dry or wet basis, as long as it is the same basis before and after the adjustments are made).</p> <p>(6) Maintain onsite and submit, if requested by the Administrator, biennial report containing the information in (6)(i) through (iii) below:</p> <p>(i) The concentrations of CO in the effluent stream in parts per million, by volume, and oxygen in volume percent, measured before and after the tune-up of the boiler.</p> <p>(ii) A description of any corrective actions taken as a part of the tune-up of the boiler.</p> <p>(iii) The type and amount of fuel used over the 12 months prior to the biennial tune-up of the boiler.</p> <p>(7) If the unit is not operating on the required date for a tune-up, the tune-up must be conducted within one week of startup.</p>	40 CFR Section 63.11223(b)
The Permittee must comply with the General Provisions as applicable in Table 8 of 40 CFR pt. 63, subp. JJJJJJ.	40 CFR Section 63.11235; 40 CFR pt. 63 subp. JJJJJJ, Table 8
<b>RECORDKEEPING</b>	hdr
<p>The Permittee must maintain the following records:</p> <p>(1) A copy of each notification and report that was submitted to comply with subpart JJJJJJ, including all documentation supporting any Initial Notification or Notification of Compliance Status that was submitted, according to the requirements in 40 CFR Section 63.10(b)(2)(xiv);</p> <p>(2) Records to document conformance with the work practices, emission reduction measures, and management practices required by 40 CFR Section 63.11214 as follows:</p> <p>(i) Records must identify each boiler, the date of tune-up, the procedures followed for tune-up, and the manufacturer's specifications to which the boiler was tuned.</p> <p>(ii) Records documenting the fuel type(s) used monthly by each boiler, including, but not limited to, a description of the fuel and the total fuel usage amount with units of measure.</p> <p>(continued below)</p>	40 CFR Section 63.11225(c)
<p>(continued)</p> <p>(3) Records of the occurrence and duration of each malfunction of each boiler or of the associated air pollution control and monitoring equipment.</p> <p>(4) Records of actions taken during periods of malfunction to minimize emissions in accordance with the general duty to minimize emissions in 40 CFR Section 63.11205(a), including corrective actions to restore the malfunctioning boiler, air pollution control, or monitoring equipment to its normal or usual manner of operation.</p>	40 CFR Section 63.11225(c)

**TABLE A: LIMITS AND OTHER REQUIREMENTS****A-11****02/25/13**

Facility Name: Abbott Northwestern Hospital

Permit Number: 05300061 - 002

(continued)  (5) Records of all inspection and monitoring data as required by 40 CFR Sections 63.11221 and 63.11222, and the information identified below for each required inspection or monitoring: (i) The date, place, and time of the monitoring event; (ii) Person conducting the monitoring. (iii) Technique or method used; (iv) Operating conditions during the activity; (v) Results, including the date, time, and duration of the period from the time the monitoring indicated a problem to the time that monitoring indicated proper operation; (vi) Maintenance or corrective action taken (if applicable).	40 CFR Section 63.11225(c)
Records must be in a form suitable and readily available for expeditious review, according to 40 CFR Section 63.10(b)(1). The Permittee must keep each record for 5 years following the date of each recorded action. The Permittee must keep each record onsite for at least 2 years after the date of each recorded action according to 40 CFR Section 63.10(b)(1). The Permittee may keep the records off site for the remaining 3 years.	40 CFR Section 63.11225(d)
<b>REPORTING AND NOTIFICATION REQUIREMENTS</b>	hdr
The Permittee must prepare by March 1 every two years, and submit to the Administrator upon request, an biennial compliance certification report. The Permittee must submit the biennial compliance report by March 15 if the Permittee had any instance described by item 3 below. The biennial compliance certification report for the previous two calendar years must contain the information the following. (1) Company name and address. (2) Statement by a responsible official, with the official's name, title, phone number, e-mail address, and signature, certifying the truth, accuracy, and completeness of the notification and a statement of whether the source has complied with all the relevant standards and other requirements of Subpart JJJJJJ. (3) Include a description of deviations from the applicable requirements during the reporting period, the time periods during which the deviations occurred, and the corrective actions taken.	40 CFR Sections 63.11225(b)
The Permittee must submit the Notification of Compliance Status in accordance with 40 CFR Section 63.9(h) no later than 120 days after the applicable compliance date specified in 40 CFR Section 63.11196. In addition to the information required in 40 CFR Section 63.9(h), the notification must include the following certifications of compliance, as applicable and signed by a responsible official: "This facility complies with the requirements in 40 CFR Section 63.11214 to conduct an initial tune-up of the boiler."	40 CFR Section 63.11225(a)(4)
The Permittee must conduct a performance tune-up according to 40 CFR pt. 63.11223(b) and submit a signed statement in the Notification of Compliance Status report that indicates that the Permittee conducted a tune-up of the boiler.	40 CFR Section 63.11214(b)
The Permittee must submit all of the notifications in 40 CFR Sections 63.7(b): 63.8(e) and (f); 63.9(b) through (e); and 63.9(g) and (h) that apply by the dates specified in those sections.	40 CFR Section 63.11225(a)(1)

**TABLE A: LIMITS AND OTHER REQUIREMENTS****A-12**

02/25/13

Facility Name: Abbott Northwestern Hospital

Permit Number: 05300061 - 002

**Subject Item: GP 004 Natural Gas Boilers (10th Ave Bldg/Garage)**

**Associated Items:** EU 019 Raypak H34001 (parking garage)  
EU 020 Raypak H34001 (parking garage)  
EU 021 Hydrotherm KN-30 #1(10th Ave-Lab)  
EU 022 Hydrotherm KN-30 #2(10th Ave-Lab)  
EU 023 Hydrotherm KN-30 #3(10th Ave-Lab)  
EU 024 Hydrotherm KN-30 #4(10th Ave-Lab)  
EU 025 Lattner#5 (10th Ave-Lab)  
EU 026 Lattner#6 (10th Ave-Lab)  
EU 028 Hydrotherm KN-30 #7(10th Ave)

What to do	Why to do it
Emission limits apply to each emission unit individually	hdr
Total Particulate Matter: less than or equal to 0.40 lbs/million Btu heat input . The potential to emit from each GP004 unit is 0.0078 lb/mmBtu due to equipment design and 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 by design.	Minn. R. 7005.0100, subp. 35a

**TABLE A: LIMITS AND OTHER REQUIREMENTS****A-13**

02/25/13

Facility Name: Abbott Northwestern Hospital

Permit Number: 05300061 - 002

**Subject Item:** GP 005 Ethylene Oxide Sterilizers and Abator**Associated Items:** CE 001 Ethylene Oxide Abator

EU 029 Ethylene Oxide Sterilizer

EU 030 Ethylene Oxide Sterilizer

What to do	Why to do it
The Permittee shall vent emissions from the ethylene oxide sterilizers (EU029 and EU030) to control equipment meeting the requirements described in GP005.	Minn. Stat. Section 116.07, subd. 4a, Minn. R. 7007.0800, subps. 2 and 14
CONTROL EQUIPMENT REQUIREMENTS	hdr
The Permittee shall operate and maintain the control equipment such that it achieves an overall control efficiency for Ethylene oxide: greater than or equal to 99.9 percent control efficiency	Minn. R. 7007.0800, subps. 2 and 14
The Permittee shall operate and maintain the ethylene oxide abator any time that any ethylene oxide sterilizer controlled by the abator is(are) in operation. The Permittee shall document periods of non-operation of the control equipment.	Minn. R. 7007.0800, subps. 2 and 14
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, subps. 4, 5, and 14
Corrective Actions: If the abator (CE001) 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 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 abator. The Permittee shall keep a record of the type and date of any corrective action taken for the abator.	Minn. R. 7007.0800, subps. 4, 5, and 14
Operation and Maintenance of the Abator (CE001): The Permittee shall operate and maintain the abator 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
40 CFR pt. 63, subp. WWWW Requirements	hdr
Enforcement Not Delegated to MPCA	
Abbott operates two Ethylene Oxide Sterilizers, each of which is an existing affected source subject to the requirements in Subpart WWWW. Terms used in Subpart WWWW are defined at 40 CFR Section 63.10448.	40 CFR Section 63.10382 and 63.10448
The Permittee must sterilize full loads of items having a common aeration time, except under medically necessary circumstances.  Medically necessary means circumstances that a hospital central services staff, a hospital administrator, or a physician concludes, based on generally accepted medical practices, necessitate sterilizing without a full load in order to protect human health.  The Permittee must begin compliance with this requirement no later than December 29, 2008	40 CFR Section 63.10390 and 63.10448
The Permittee must submit an Initial Notification of Compliance Status certifying that the Permittee is venting the ethylene oxide emissions from each sterilization unit to an add-on air pollution control device. The Permittee must certify that the Permittee is operating the control device during all sterilization processes and in accordance with manufacturer's procedures.	40 CFR Section 63.10400
The Initial Notification of Compliance Status must be submitted no later than June 27, 2009.  The Initial Notification of Compliance Status must include the information required in 40 CFR Section 63.10430.  The Permittee must submit the Initial Notification of Compliance Status to: EPA Region V, Director, Air and Radiation Division, 77 West Jackson Blvd. Chicago, IL 60604-3507.  The Permittee must also submit a copy of the Initial Notification of Compliance Status to the EPA's Office of Air Quality Planning and Standards at the addresses listed at 40 CFR Section 63.10430.  The Permittee must keep a copy of the Initial Notification of Compliance Status submitted to demonstrate initial compliance.	40 CFR Sections 63.10402, 63.10430 and 63.10432; 40 CFR Section 63.13

**TABLE A: LIMITS AND OTHER REQUIREMENTS****A-14**

02/25/13

Facility Name: Abbott Northwestern Hospital

Permit Number: 05300061 - 002

<p>The records required in 40 CFR Section 63.10432 must be kept in a form suitable for expeditious review.</p> <p>The records required in 40 CFR Section 63.10432 must be kept for 5 years following the date of each record.</p> <p>The records required in 40 CFR Section 63.10432 must be kept onsite for at least 2 years after the date of each record. Each one of these records may be kept offsite for the remaining 3 years.</p>	<p>40 CFR Sections 63.10432, 63.10434, and 63.10(b)(1); Minn. R. 7019.0100, subp. 2(B)</p>
<p>Table 1 to Subpart W of Part 63 indicates which parts of the General provisions in 40 CFR Section 63.1 through 63.16 apply.</p>	<p>40 CFR Section 63.10440; 40 CFR Part 63 Subpart A</p>

**TABLE A: LIMITS AND OTHER REQUIREMENTS**

A-15 02/25/13

Facility Name: Abbott Northwestern Hospital

Permit Number: 05300061 - 002

**Subject Item:** EU 027 Caterpillar 3516C (10th Ave-Lab)**Associated Items:** SV 021 Caterpillar 3516C

What to do	Why to do it
EMISSION LIMITS	hdr
Carbon Monoxide: less than or equal to 3.50 grams/kilowatt-hour	40 CFR Section 60.4205(b); 40 CFR Section 89.112; Minn. R. 7011.3520
Total Particulate Matter: less than or equal to 0.20 grams/kilowatt-hour	40 CFR Section 60.4205(b); 60.4205(b); 40 CFR Section 89.112; Minn. R. 7011.3520
NMHC + NOx: less or equal to than 6.40 grams/kilowatt-hour  This is an average emission rate, not a maximum emission rate at all loads. Compliance is demonstrated by maintaining applicable certification from the manufacturer on file.	40 CFR Section 60.4205(b); 60.4205(b); 40 CFR Section 89.112; Minn. R. 7011.3520
Opacity: less than or equal to 20 percent opacity during the acceleration mode, less than 15 percent opacity during the lugging mode, and less than 50 percent opacity during the peaks in either the acceleration or lugging modes.	40 CFR Section 60.4205(b); 40 CFR Section 89.113; Minn. R. 7011.3520
Opacity: less than or equal to 20 percent opacity once operating temperatures have been obtained.	Minn. R. 7011.2300, subp. 1
Sulfur Dioxide: less than or equal to 0.5 lbs/million Btu heat input .  The potential to emit from each GP002 unit is less than 0.002 lb/MMBtu due to equipment design and allowable fuels.	Minn. R. 7011.2300, subp. 2
OPERATING REQUIREMENTS	hdr
Permitted Fuel: No. 2 fuel oil with a sulfur content not exceeding 0.0015% by weight.	Minn. R. 7007.0800, subp. 2
Operating Hours: less than or equal to 300 hours/year using 12-month Rolling Sum for each generator.	Minn. R. 7007.0800, subp. 2
Operate and maintain EU027 according to the manufacturer's written instructions or procedures developed by the owner or operator that are approved by the engine manufacturer, over the entire life of the engine.	40 CFR Section 60.4206; Minn. R. 7011.3520
MONITORING AND RECORDKEEPING REQUIREMENTS	hdr
The Permittee shall keep records of fuel type and hourly usage on a monthly basis.	Minn. R. 7007.0800, subp. 2
Fuel Supplier Certification: The Permittee shall obtain and maintain a fuel supplier certification for each shipment of No. 2 fuel oil, certifying that the sulfur content does not exceed 0.0015% by weight.	Minn. R. 7007.0800, subps. 4 and 5
Fuel Use: EU027 may be operated only on diesel fuel that meets the requirements of 40 CFR Section 80.510(b) for nonroad diesel fuel:  15 ppm maximum sulfur content; Minimum cetane index of 40; and Maximum aromatic content of 35 volume percent	40 CFR Section 60.4207(b); 40 CFR Section 80.510(b); 40 CFR Section 63.6590(c); Minn. R. 7011.3520
The Permittee shall install a non-resettable hour meter prior to startup of EU027.	40 CFR Section 60.4209(a); 40 CFR Section 63.6590(c); Minn. R. 7011.3520
Hours of Operation Records: The Permittee shall maintain records of hours of operation on site that document that the unit is an emergency diesel 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 & 5
EU027 may be operated for the purpose of maintenance checks and readiness testing, provided that the tests are recommended by Federal, State, or local government, the manufacturer, the vendor, or the insurance company associated with the engine. Maintenance checks and readiness testing of such units is limited to 100 hours per year. There is no time limit on the use of EU027 in emergency situations. Anyone may petition the Administrator for approval of additional hours to be used for maintenance checks and readiness testing, but a petition is not required if the Permittee maintains records indicating that Federal, State, or local standards require maintenance and testing of emergency ICE beyond 100 hours per year. Any operation other than emergency operation, and maintenance and testing as permitted in 40 CFR Section 60.4211(e), is prohibited.	40 CFR Section 60.4211(e); 40 CFR Section 63.6590(c); Minn. R. 7011.3520
Maintain records of the operation of EU027 in emergency and non-emergency service that are recorded through the non-resettable hour meter. Record the time of operation and the reason EU027 was in operation during that time.	40 CFR Section 60.4214(b); 40 CFR Section 63.6590(c); Minn. R. 7011.3520

**TABLE A: LIMITS AND OTHER REQUIREMENTS****A-16**

02/25/13

Facility Name: Abbott Northwestern Hospital

Permit Number: 05300061 - 002

During every monthly test of EU027, record the following information: 1) the date, 2) the time the test was started, and 3) the time the test was completed.	Minn. R. 7007.0800, subps. 4 and 5
EU027 is a new affected source as defined under 40 CFR pt. 63, subp. ZZZZ, and the facility is an area source as defined at 40 CFR Section 63.2. The Permittee shall meet the requirements of 40 CFR pt. 63, subp. ZZZZ by meeting the requirements of 40 CFR pt. 60, subp. IIII. No further requirements of 40 CFR pt. 63, subp. ZZZZ apply to EU027 at the time of permit issuance.	40 CFR Section 63.6590(c); Minn. R. 7011.8150



**TABLE B: SUBMITTALS****B-1** 02/25/13

Facility Name: Abbott Northwestern Hospital  
Permit Number: 05300061 - 002

Also, where required by an applicable rule or permit condition, send to the Permit Document Coordinator notices of:

- accumulated insignificant activities,
- installation of control equipment,
- replacement of an emissions unit, and
- changes that contravene a permit term.

Send any application for a permit or permit amendment to:

Fiscal Services  
Minnesota Pollution Control Agency  
520 Lafayette Road North  
St. Paul, Minnesota 55155-4194

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

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

Chief Air Enforcement  
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 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.

**TABLE B: RECURRENT SUBMITTALS****B-2** 02/25/13

Facility Name: Abbott Northwestern Hospital

Permit Number: 05300061 - 002

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 occurred, the Permittee shall submit the report stating no deviations.	Total Facility
Compliance Certification	due 31 days after end of each calendar year following Permit Issuance (for the previous calendar year). The Permittee shall submit this to the Commissioner on a form approved by the Commissioner. This report covers all deviations experienced during the calendar year.	Total Facility

## APPENDIX I: Insignificant Activities and Applicable Requirements

Facility Name: Abbott Northwestern Hospital

Permit Number: 05300061-002

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

Minn. R. 7007.1300, subpart	Rule Description of the Activity	Applicable Requirement
3(I)	<p>Individual emissions units at a stationary source, each of which have a potential to emit the following pollutants in amounts less than:</p> <ol style="list-style-type: none"><li>1. 4,000 lbs/year of carbon monoxide;</li><li>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; and</li><li>3. 1,000 tons/year of CO<sub>2</sub>e</li></ol> <p>• Abbott operates 2 natural gas-fired hot water heaters with a maximum heat input of 0.199 mMBTU/hr each at the 10<sup>th</sup> Avenue Building which qualify under this subpart.</p>	Minn. R. 7011.0510/0515

## Appendix II: Exhaust Parameters and Emission Rates Used For Modeling

Facility Name: Abbott Northwestern Hospital

Permit Number: 05300060-002

Source ID	Stack ID	Source Description	MODELED EXHAUST PARAMETERS											
			Height		Diameter		Velocity		Gas Temp		Flow Rate		Stack Orientation	
			(ft)	(m)	(ft)	(m)	(ft/min)	(m/sec)	(°F)	(°K)	(acfm)	(m³/sec)	V/H ?	Capped?
EU01 EU02 EU03 EU04	SV01	Boiler 1 (Bros, 29 MMBtu/hr) Boiler 2 (Bros, 29 MMBtu/hr) Boiler 3 (Bros, 29 MMBtu/hr) Boiler 4 (Cleaver Brooks, 77 MMBtu/hr)	100.0	30.48	6.00	1.83	2,182	11.08	524	546	61,688	29.11	V	No
EU05	SV02	IC Engine 1 (685 bhp peaking)	20.0	6.10	0.67	0.20	10,313	52.391	955	786	3,600	1.70	V	No
EU06	SV03	IC Engine 2 (685 bhp peaking)	20.0	6.10	0.67	0.20	10,313	52.391	955	786	3,600	1.70	V	No
EU07	SV04	IC Engine 3 (685 bhp peaking)	20.0	6.10	0.67	0.20	10,399	52.828	915	764	3,630	1.71	V	No
EU08	SV05	IC Engine 4 (685 bhp peaking)	30.0	9.14	0.67	0.20	10,399	52.828	915	764	3,630	1.71	V	No
EU09	SV06	IC Engine 5 (890 bhp peaking)	35.0	10.67	0.67	0.20	11,050	56.135	950	783	5,455	2.57	45°	No
EU10	SV07	IC Engine 6 (355 bhp emergency)	20.0	6.10	0.42	0.13	23,395	118.84 7	980	800	3,190	1.51	V	No
EU11 EU12 EU13 EU14	SV08	Boiler 5 (Cleaver Brooks, 8.7 MMBtu/hr) Boiler 6 (Cleaver Brooks, 8.7 MMBtu/hr) Boiler 7 (Cleaver Brooks, 8.7 MMBtu/hr) Boiler 8 (Cleaver Brooks, 8.7 MMBtu/hr)	135.0	41.15	2.50	0.76	2,445	12.419	520	544	12,000	5.66	V	No
EU15	SV09	IC Engine 7 (1,135 bhp emergency)	36.0	10.97	0.92	0.28	9,361	47.553	895	753	6,160	2.91	V	No
EU16	SV10	IC Engine 8 (1,135 bhp emergency)	36.0	10.97	0.92	0.28	9,361	47.553	895	753	6,160	2.91	V	No
EU17	SV11	IC Engine 9 (1,135 bhp emergency)	36.0	10.97	0.92	0.28	9,361	47.553	895	753	6,160	2.91	V	No
EU18	SV12	IC Engine 10 (382 bhp emergency)	30.0	9.14	0.50	0.15	11,077	56.272	994	808	2,175	1.03	V	No
EU19	SV13	Raypak Boiler (4 MMBtu/hr)	100.0	30.48	3.50	1.07	113	0.573	350	450	1,085	0.51	V	No
EU20	SV14	Raypak Boiler (4 MMBtu/hr)	100.0	30.48	3.50	1.07	113	0.573	350	450	1,085	0.51	V	No
EU21	SV15	Lab Hot Water Boiler (3 MMBtu/hr)	119.0	36.27	0.75	0.23	1,456	0.001	180	355	643	0.30	V	Yes
EU22	SV16	Lab Hot Water Boiler (3 MMBtu/hr)	119.0	36.27	0.75	0.23	1,456	0.001	180	355	643	0.30	V	Yes
EU23	SV17	Lab Hot Water Boiler (3 MMBtu/hr)	119.0	36.27	0.75	0.23	1,456	0.001	180	355	643	0.30	V	Yes
EU24	SV18	Lab Hot Water Boiler (3 MMBtu/hr)	119.0	36.27	0.75	0.23	1,456	0.001	180	355	643	0.30	V	Yes
EU25	SV19	Lab Steam Boiler (Latner 1.7 MMBtu/hr)	118.0	35.97	1.00	0.30	543	2.758	300	422	426	0.20	V	No
EU26	SV20	Lab Steam Boiler (Latner 1.7 MMBtu/hr)	118.0	35.97	1.00	0.30	543	2.758	300	422	426	0.20	V	No
EU27	SV21	IC Engine (Lab Emergency Generator)	30.0	9.14	1.00	0.30	19,470	98.907	752	673	15,292	7.22	V	No
EU28	SV22	Lab Hot Water Boiler (3 MMBtu/hr)	119.0	36.27	0.75	0.23	1,456	0.001	180	355	643	0.30	V	Yes

			MODELED EMISSION RATES											
Source ID	Stack ID	Source Description	NOx		PM10		PM2.5		CO		LEAD		SO2	
			lb/hr	g/s	lb/hr	g/s	lb/hr	g/s	lb/hr	g/s	lb/hr	g/s	lb/hr	g/s
EU01 EU02 EU03 EU04	SV01	Boiler 1 Boiler 2 Boiler 3 Boiler 4	23.4286	2.9519	2.6943	0.3395	1.8157	0.2288	13.5059	1.7017	1.5E-03	1.9E-04	0.2495	0.0314
EU05	SV02	IC Engine 1	14.5779	1.8368	0.2610	0.0329	0.2533	0.0319	3.8723	0.4879	0.0E+00	0.0E+00	0.0069	0.0009
EU06	SV03	IC Engine 2	14.5779	1.8368	0.2610	0.0329	0.2533	0.0319	3.8723	0.4879	0.0E+00	0.0E+00	0.0069	0.0009
EU07	SV04	IC Engine 3	16.4013	2.0665	0.2937	0.0370	0.2850	0.0359	4.3566	0.5489	0.0E+00	0.0E+00	0.0078	0.0010
EU08	SV05	IC Engine 4	16.4013	2.0665	0.2937	0.0370	0.2850	0.0359	4.3566	0.5489	0.0E+00	0.0E+00	0.0078	0.0010
EU09	SV06	IC Engine 5	21.8669	2.7552	0.3916	0.0493	0.3799	0.0479	5.8084	0.7318	0.0E+00	0.0E+00	0.0104	0.0013
EU10	SV07	IC Engine 6	10.5514	1.3294	0.7417	0.0935	0.7417	0.0935	2.2730	0.2864	0.0E+00	0.0E+00	0.0036	0.0005
EU11 EU12 EU13 EU14	SV08	Boiler 5 Boiler 6 Boiler 7 Boiler 8	5.1200	0.6451	0.5888	0.0742	0.3968	0.0500	1.2800	0.1613	3.2E-04	4.1E-05	0.0545	0.0069
EU15	SV09	IC Engine 7	19.9360	2.5119	0.3570	0.0450	0.3464	0.0436	5.2955	0.6672	0.0E+00	0.0E+00	0.0094	0.0012
EU16	SV10	IC Engine 8	19.9360	2.5119	0.3570	0.0450	0.3464	0.0436	5.2955	0.6672	0.0E+00	0.0E+00	0.0094	0.0012
EU17	SV11	IC Engine 9	19.9360	2.5119	0.3570	0.0450	0.3464	0.0436	5.2955	0.6672	0.0E+00	0.0E+00	0.0094	0.0012
EU18	SV12	IC Engine 10	9.2469	1.1651	0.6500	0.0819	0.6500	0.0819	1.9920	0.2510	0.0E+00	0.0E+00	0.0032	0.0004
EU19	SV13	Raypak Boiler	0.4000	0.0504	0.0304	0.0038	0.0304	0.0038	0.3360	0.0423	2.0E-06	2.5E-07	0.0024	0.0003
EU20	SV14	Raypak Boiler	0.4000	0.0504	0.0304	0.0038	0.0304	0.0038	0.3360	0.0423	2.0E-06	2.5E-07	0.0024	0.0003
EU21	SV15	Lab Hot Water Boiler	0.3000	0.0378	0.0228	0.0029	0.0228	0.0029	0.2520	0.0318	1.5E-06	1.9E-07	0.0018	0.0002
EU22	SV16	Lab Hot Water Boiler	0.3000	0.0378	0.0228	0.0029	0.0228	0.0029	0.2520	0.0318	1.5E-06	1.9E-07	0.0018	0.0002
EU23	SV17	Lab Hot Water Boiler	0.3000	0.0378	0.0228	0.0029	0.0228	0.0029	0.2520	0.0318	1.5E-06	1.9E-07	0.0018	0.0002
EU24	SV18	Lab Hot Water Boiler	0.3000	0.0378	0.0228	0.0029	0.0228	0.0029	0.2520	0.0318	1.5E-06	1.9E-07	0.0018	0.0002
EU25	SV19	Lab Steam Boiler	0.1675	0.0211	0.0127	0.0016	0.0127	0.0016	0.1407	0.0177	8.4E-07	1.1E-07	0.0010	0.0001
EU26	SV20	Lab Steam Boiler	0.1675	0.0211	0.0127	0.0016	0.0127	0.0016	0.1407	0.0177	8.4E-07	1.1E-07	0.0010	0.0001
EU27	SV21	IC Engine (Lab Emergency Generator)	42.1000	5.3045	0.2300	0.0290	0.2300	0.0290	3.4500	0.4347	0.0E+00	0.0E+00	0.0293	0.0037
EU28	SV22	Lab Hot Water Boiler	0.3000	0.0378	0.0228	0.0029	0.0228	0.0029	0.2520	0.0318	1.5E-06	1.9E-07	0.0018	0.0002

**TECHNICAL SUPPORT DOCUMENT**  
**For**  
**DRAFT AIR EMISSION PERMIT NO. 05300061-002**

This technical support document (TSD) is intended for all parties interested in the permit and to meet the requirements that have been set forth by the federal and state regulations (40 CFR § 70.7(a)(5) and Minn. R. 7007.0850, subp. 1). The purpose of this document is to provide the legal and factual justification for each applicable requirement or policy decision considered in the determination to issue the permit.

**1. General Information**

**1.1 Applicant and Stationary Source Location:**

**Table 1. Applicant and Source Address**

<b>Applicant/Address</b>	<b>Stationary Source/Address (SIC Code: 8602)</b>
Allina Health System  Mailing address: P.O. Box 43 Minneapolis, MN 55440-0043  Street address: The Commons at Midtown Exchange 2925 Chicago Avenue, Minneapolis, MN 55407	Abbott Northwestern Hospital  800 28th St E Minneapolis, Minnesota 55407 Hennepin County
Contact: Tim Grote Phone: 612-863-4164	

**1.2 Facility Description**

Abbott Northwestern Hospital (Abbott) is owned by Allina Health System and includes the hospital and associated laboratories and diagnostic centers.

The main emissions units at Abbott include boilers and emergency generators. Pollutants of concern include products of combustion such as nitrogen oxides, carbon monoxide, particulate matter, particulate matter less than 10 microns, and particulate matter less than 2.5 microns. The permit contains operating limits on natural gas and Number 2 fuel oil usage for the Group 1 (GP001) boilers and on Number 2 fuel oil usage for the GP003 boilers. The emergency generators are limited to 300 hours per year. Abbott also operates two ethylene oxide sterilizers, which are controlled by an ethylene oxide abator (CE001).

Abbott's existing permit is a federally enforceable state operating permit (FESOP).

**1.3 Description of the Activities Allowed by this Permit Action**

The MPCA received Abbott's major amendment permit application on April 3, 2012. This permit action authorizes the following activities:

1. Change the back-up fuel for the GP001 boilers – from Number 6 fuel oil to Number 2 fuel oil, and
2. Add the natural gas boilers and emergency generator, EU027, associated with the lab in the 10<sup>th</sup> Avenue building to the permit. The lab natural gas boilers (EU019, EU020, EU021, EU022, EU023, EU024, EU025, EU026, and EU028) are included at GP004 in the permit.

As part of authorizing these changes, several permit requirements have been amended or added due to the analyses included in the permit application.

- The existing generators in GP002 are now limited to emergency use only due to the Cumulative Levels and Effects Analysis. Previously, the permit limited the GP002 generators to 300 hours per year, but the generators could be operated in a utility company peaking program, so they did not qualify as emergency generators under the September 6, 1995 EPA memorandum entitled "Calculating Potential to Emit (PTE) for Emergency Generators". Abbott has cancelled the contract for the peaking program.
- Requirements for monthly maintenance testing of the GP002 emergency generators and EU027 were added to the permit to reflect the scenario modeled for this permit action. Monthly maintenance testing for the emergency generators (GP002 and EU027) will be conducted such that only one generator operates at a time.
- Because criteria pollutant modeling was included as part of the Cumulative Levels and Effects Analysis conducted to comply with Minn. Stat. § 116.07, subd. 4a, the modeling parameters are included in Appendix II to the permit.
- GP005 has been added for the two ethylene oxide sterilizers (EU029 and EU030) that are used for sterilizing hospital equipment and the ethylene oxide abator (CE001). These units were also included in the CL&E analysis.

#### **1.4 Description of Other Changes Made in this Permit Action**

The MPCA has a combined operating and construction permitting program under Minnesota Rules Chapter 7007. Under Minn. R. 7007.0800, the MPCA has authority to include additional requirements in a permit. Under that authority, the following changes to the permit are also made through this permit action:

- Citations were corrected to reflect synthetic minor status with respect to Part 70. Other citations have been updated to reflect current MPCA policy.
- Because the previously permitted GP002 and GP004 emergency generators now have the same requirements, the GP002 and GP004 generators have been combined into one group (GP002).
- Standard conditions have been updated to reflect current MPCA policy and guidelines.
- There are two appendixes to the permit. Appendix I has been changed from PTE calculations to insignificant activities. PTE calculations are described and included in this technical support document. The insignificant activities table has been updated to current MPCA policy. Appendix II

now contains modeling parameters, including a table for exhaust parameters, a table for emission rates for emission rates.

## 1.5 Facility Emissions and Classification

Table 2 compares the permit allowable emissions for the existing permit to the proposed permit. Generally, permit allowable emissions are being reduced through this permit action due to the fuel change in the boilers GP001. Actual emissions for the most recent available year, 2010, are also listed.

**Table 2. Total Facility Potential to Emit Summary**

	PM tpy	PM <sub>10</sub> tpy	PM <sub>2.5</sub> tpy	SO <sub>2</sub> tpy	NO <sub>x</sub> tpy	CO tpy	CO <sub>2</sub> e tpy	VOC tpy	Single HAP tpy	All HAPs tpy
Existing Permit Total Facility Limited Emissions	59.4	39.0	*	98.3	98.7	44.0	*	5.8	0.013	0.06
Permit Total Facility Limited Emissions	6.1	5.6	5.3	0.4	91.6	53.1	74,200	4.1	0.95	1.0
Total Facility Actual Emissions (2010)	1.2	1.2	**	1.8	14.5	10.8	**	0.82	**	

\*These pollutants were not regulated or inventoried at the time of the existing permit issuance.

\*\* Not reported in MN emission inventory.

**Table 3. Facility Classification**

Classification	Major/Affected Source	Synthetic Minor	Minor/Area
PSD		X	
Part 70 Permit Program		X	
Part 63 NESHAP			X

## 2. Regulatory and/or Statutory Basis

### New Source Review

The facility has previously accepted operational limits to reduce NO<sub>x</sub> and SO<sub>2</sub> emissions to avoid PSD/NSR. These operational limits also limit CO<sub>2</sub>e emissions to below the major source threshold. This permit action does not change the facility's status with respect to PSD/NSR.

### Part 70 Permit Program



The facility has previously accepted operational limits to reduce NO<sub>x</sub> and SO<sub>2</sub> emissions to avoid a Part 70 permit and has an existing federally enforceable individual state permit. These operational limits also limit CO<sub>2</sub>e emissions to below the major source threshold. This permit action does not change the facility's status with respect to Part 70.

#### New Source Performance Standards (NSPS)

EU027 is a new emergency generator subject to 40 CFR pt. 60, subpart IIII. EU027 is an emergency generator manufactured after April 1, 2006, with a displacement less than 30 liters/cylinder.

#### National Emission Standards for Hazardous Air Pollutants (NESHAPs)

The facility is an area source under 40 CFR pt. 63. Thus, no major source NESHAPs apply.

At this time, the status of the facility in terms of area source standards is as follows:

- For emergency generator EU027, under 40 CFR § 63.6590(c), Abbott demonstrates compliance with the area source requirements of 40 CFR pt. 63, subp. ZZZZ by meeting the applicable requirements of 40 CFR pt. 60, subp. IIII.
- NESHAP Subpart ZZZZ does not apply for the existing (previously permitted) emergency generators at the facility), because these generators qualify as existing institutional emergency stationary RICE at an area source of HAP emissions under 40 CFR § 63.6590 (b)(3)(viii).
- Existing boilers in GP001 and GP003 are subject to 40 CFR pt. 63, subp. JJJJJ National Emissions Standards for Hazardous Air Pollutants for Industrial, Commercial, and Institutional Boilers Area Sources (Subpart JJJJJ). Abbott uses natural gas as the main fuel in these boilers. However, Abbott has entered an agreement with the utility to voluntarily switch to fuel oil under certain circumstances, not necessarily a formal natural gas curtailment. This agreement means they do not qualify under 'gas-fired' boilers. The applicable requirements of Subpart JJJJJ have been added to the permit.
- The boilers in GP004, Natural Gas Boilers (10<sup>th</sup> Ave Bldg/Garage), are not subject to 40 CFR pt. 63, Subpart JJJJJ, because the only fuel used is natural gas by design and, therefore, these units can be classified as 'gas fired boilers' as defined in 40 CFR § 63.11237.
- Abbott operates two ethylene oxide sterilizers subject to 40 CFR pt. 63, subp. WWWW National Emission Standards for Hospital Ethylene Oxide Sterilizers. These units were assessed in the Cumulative Levels and Effects analysis and were therefore included as emission units in the permit, due to the need to use control equipment. These units would otherwise qualify as insignificant activities under Minn. R. 7007.1300, subp. 3(I).
- The Permittee states that no other area source NESHAPs apply.

#### Compliance Assurance Monitoring (CAM)

CAM does not apply to the modification allowed in this permit amendment, since this is not a Part 70 permit.

### Environmental Review

The facility is located in the City of Minneapolis within an area described by Minn. Stat. § 116.07, subd. 4a and is subject to the Cumulative Levels and Effects (CL&E) Analysis requirements of the statute. An Air Emissions Risk Analysis (AERA) and criteria pollutant modeling was conducted as part of the CL&E Analysis. Information on the Facility's Cumulative Levels and Effects Analysis, including summaries of the AERA and air dispersion modeling, can be found in Section 3.3 of this document.

### Minnesota State Rules

Portions of the facility are subject to the following Minnesota Standards of Performance:

- Minn. R. 7011.0510 Standards of Performance for Existing Indirect Heating Equipment
- Minn. R. 7011.0515 Standards of Performance for New Indirect Heating Equipment
- Minn. R. 7011.2300 Standards of Performance for Stationary Internal Combustion Engines

**Table 4. Regulatory Overview of Units Affected by the Modification/Permit Amendment**

<b>Level*</b>	<b>Applicable Regulations</b>	<b>Comments:</b>
GP001 (Main Campus boilers)  And  GP003 (Heart Hospital Boilers)	Title I limits to avoid PSD  Limits to avoid Part 70  40 CFR pt. 63, Subpart JJJJJ  Minn. R. 7011.0510	Prevention of Significant Deterioration. Operational limits set on annual fuel usage to reduce potential emissions of NO <sub>x</sub> and SO <sub>2</sub> from the boilers to avoid classification as a major source under 40 CFR § 52.21.  Operational limits set on annual fuel usage to reduce potential emissions of NO <sub>x</sub> and SO <sub>2</sub> from the boilers to avoid major source classification under 40 CFR pt. 70.  National Emission Standards for Hazardous Air Pollutants for Industrial, Commercial and Institutional Boilers Area Sources  Minn. R. 7011.0510 Standards of Performance for Existing Indirect Heating Equipment
GP002 and EU027 (Emergency Generators)	Minn. R. 7011.2300  Minn. R. 7005.0100, subp. 35a, Minn. R. 7007.0800, subp. 2, Minn. R. 7007.0800, subp. 11.	Standards of Performance for Stationary Internal Combustion Engines. Opacity and SO <sub>2</sub> limits. Limits on sulfur content in fuels will ensure compliance with SO <sub>2</sub> limits.  The Permittee shall maintain documentation on-site that the unit is an emergency generator by design that qualifies under the EPA memorandum entitled "Calculating Potential to Emit (PTE) for Emergency Generators" dated September 6, 1995, limiting operation to 500 hours per year.

Level*	Applicable Regulations	Comments:
GP004 (10 <sup>th</sup> Ave Building/ Garage boilers)	Minn. R. 7011.0515	Standards of Performance for New Indirect Heating Equipment. Determination of applicable limits from rule: <ul style="list-style-type: none"> <li>• each unit was constructed after 1977;</li> <li>• the facility is located within Minneapolis/St. Paul in Tables I and II;</li> <li>• each unit only uses natural gas;</li> <li>• each unit has less than 100 mmBTU/hr; and</li> <li>• the facility has less than 250 MMBtu/hr of indirect heating equipment.</li> </ul>
EU027	40 CFR pt. 60, subp. IIII  40 CFR pt. 63, subp. ZZZZ	New Source Performance Standards (NSPS) for Stationary Compression Ignition Internal Combustion Engines. The engine is certified by the manufacturer to meet the EPA Tier 2 standards at 40 CFR Part 89 for non-road engines. The facility operator must use diesel fuel that meets the requirements of 40 CFR Section 80.510.  National Emission Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines. The generator is a new unit subject to 40 CFR Part 63 Subpart ZZZZ. EU027 meets the requirements in 40 CFR Part 63 Subpart ZZZZ by meeting the requirements of 40 CFR Part 60 Subpart IIII.
GP005 (Ethylene Oxide Sterilizers)	40 CFR pt. 63, subp. WWWW  Minn. Stat. § 116.07, subd. 4a	National Emission Standards for Hospital Ethylene Oxide Sterilizers. This is an area source standard that MPCA is not delegated to enforce. It is included in the permit for reference.  Requirement to use control equipment.

\*Where the requirement appears in the permit (e.g., EU, SV, GP, etc.).

### 3. Technical Information

#### 3.1 Potential to Emit Calculations

Attachment 1 to this TSD contains Form GI-07, which summarizes the PTE of the Facility, while Attachment 2 contains detailed spreadsheets and supporting information prepared by the MPCA and the Permittee. The PTE calculations have been updated since the original permit issuance. Emission rates are generally based on AP-42 emission factors, except for several pollutants with manufacturer's guaranteed emission factors used for emergency generator EU027 emissions calculations.

#### 3.2 Dispersion Modeling

As part of the Cumulative Levels and Effects Analysis under Minn. Stat. § 116.07, subd. 4a, the Permittee was required to complete air dispersion modeling. The modeling showed compliance with the PM<sub>2.5</sub>,

PM<sub>10</sub>, CO, SO<sub>2</sub>, Lead and NO<sub>2</sub> national ambient air quality standards (NAAQS). Although maintenance testing of the emergency generators is slightly differently than the modeled scenario, the modeling results are sufficiently representative and the standards are not likely to be exceeded. Attachment 11: Emergency Generator Test Plan describes the actual testing methods implemented by Abbott. It is based on the National Fire Protection Association (NFPA) emergency testing requirements for hospitals.

Any operating restrictions assumed when the modeling was conducted have been incorporated as permit conditions (e.g., annual fuel usage, hours of operation, staggered emergency generator testing, etc.) in the draft permit. In addition, per MPCA practice, a table of the modeled parameters has been added to the permit as an appendix. Other than the operating restrictions mentioned above, the parameters listed in Appendix II of the permit describe the operation of the facility at maximum capacity. In other words, the flow rates and temperatures listed in Appendix II represent the minimum exhaust parameters at the maximum emission rates. The MPCA does not require any specific compliance demonstration with these parameters because they are worse-case conditions. The purpose of listing the parameters in the permit appendix is to provide a benchmark for determining if and when additional modeling is required.

### **3.3 Minn. Stat. § 116.07, subd. 4a: Cumulative Levels and Effects**

Minn. Stat. § 116.07, subd. 4a requires the MPCA to analyze and consider cumulative levels and effects (CL&E) of past and current environmental pollution prior to issuing a permit for a facility in the area described by the statute. The MPCA has developed two guidance documents, the Process Document and the Reference Document, for conducting and reporting the results of a CL&E Analysis. These documents may be found on the MPCA webpage: <http://www.pca.state.mn.us/qzqh484>.

Generally, the steps involved in the CL&E Analysis include:

1. Conduct criteria pollutant modeling and air emissions risk analysis (AERA).
2. Use the results of the criteria pollutant modeling and AERA to determine the study area and identify health endpoints to be described cumulatively.
3. Gather available environmental, health, and community data for the area of study and health endpoints.
4. Evaluate the facility specific impacts with respect to the available environmental, health and community data related to the health endpoints identified. In other words, place the modeled facility impacts into context with existing community conditions for a cumulative review.

#### Environmental Equity/Environmental Justice

Abbott is located in an area that meets EPA's criteria as an area of environmental justice concern. The MPCA is incorporating elements of the EPA's guidelines for environmental justice by following the Cumulative Levels and Effects Process. This process requires the MPCA 1) to analyze and consider cumulative levels and effects of past and present pollution prior to issuing a permit, and 2) to conduct expanded community outreach such as holding information sessions, providing email updates on permit processing, extended public comment period, public meetings, etc.

#### Criteria Pollutant Modeling Summary

Criteria pollutant modeling was conducted as required by the Cumulative Levels and Effects Process. A summary of the criteria pollutant modeling is included here. Detailed information on the criteria pollutant modeling may be found in Attachment 5: Air Quality Dispersion Modeling Protocol; Attachment 6: Air Quality Dispersion Modeling Protocol Review Form; and Attachment 7: Air Quality Dispersion Modeling Report. The MPCA's Air Quality Dispersion Modeling Report Review Form can be found at the end of Attachment 7. The facility-specific criteria pollutant modeling results were summed with measured and/or estimated background concentrations. These summed concentrations met the National and Minnesota Ambient Air Quality Standards for each of the pollutants modeled (PM<sub>2.5</sub>, PM<sub>10</sub>, CO, SO<sub>2</sub>, Lead and NO<sub>2</sub>).

- The modeled results for daily and annual PM<sub>2.5</sub> concentrations were above the screening levels indicated in the CL&E Process developed by the MPCA; therefore, cardiovascular events were included as a health endpoint for further investigation in the CL&E analysis.
- The modeled results for hourly and annual NO<sub>2</sub> concentrations were above the screening levels indicated in the CL&E Process developed by the MPCA; therefore, cardiovascular events were included as a health endpoint for further investigation in the CL&E analysis.

#### Air Emissions Risk Assessment (AERA) Summary

An air emissions risk assessment (AERA) was conducted as called for in the Cumulative Levels and Effects Process. A summary of the AERA is provided here, and the detailed AERA results can be found in the Facility Specific Risk Analysis and Cumulative Levels and Effects Summary in Attachment 9 to this TSD. The first step is to determine the risk estimate for each exposure scenario/duration. Next these risk assessment results are added to ambient monitoring information for a cumulative review.

The AERA is based on the highest possible emissions from the facility, which are likely not ever achieved in practice (all emission sources operating at maximum capacity), which means the resulting risk estimates are conservative. Table 5 describes the three exposure scenarios assessed at all locations in the Study Area, including: inhalation; resident; and urban gardener. The results for each exposure scenario are as follows:

- The risk estimate based on one hour (acute) inhalation exposure was above the CL&E screening level, and therefore this health endpoint (acute respiratory) was included for further investigation in the CL&E analysis.
- The risk estimates based on lifetime (chronic: non-cancer and cancer) inhalation and ingestion exposures were below the screening levels indicated for a CL&E analysis; therefore, no chronic exposure health endpoints were included for further investigation in the CL&E analysis.

**Table 5. Exposure Scenarios**

<b>Exposure Scenario</b>	<b>Exposure Pathways</b>	<b>Exposure Source</b>	<b>Exposure Durations</b>
Inhalation	Inhalation	Inhalation (air)	One-hour (acute) Lifetime (chronic: non-cancer and cancer)
Resident	Inhalation+ Ingestion	Inhalation (air) + indirect soil ingestion + direct ingestion of homegrown produce	Lifetime (chronic: non-cancer and cancer)
Urban Gardener	Inhalation+ Ingestion	Inhalation (air) + indirect soil ingestion + direct ingestion of homegrown produce + ingestion of home-produced eggs (backyard chickens)	Lifetime (chronic: non-cancer and cancer)

#### Cumulative Levels and Effects Analysis

This section provides a summary of the CL&E analysis. Detailed results of the analysis can be found in Attachment 9: Facility Specific Risk Analysis and Cumulative Levels and Effects Summary and Attachment 8: Cumulative Levels and Effects Analysis Report.

The modeling and risk assessment results identified two health endpoints for further study in the CL&E analysis: 1) acute respiratory events (from modeled NO<sub>2</sub> air concentrations), and 2) cardiovascular events (from modeled PM<sub>2.5</sub> air concentrations). The majority of the acute hazard index was from potential hourly nitrogen dioxide emissions. Nitrogen dioxide is associated with short-term respiratory effects such as asthma exacerbation. The cardiovascular event health endpoint is associated with events such as ischemic heart disease, characterized by reduced blood flow to the heart.

The risk estimate based on one hour (acute) inhalation exposure (from the AERA) was added with ambient monitoring data to provide an inhalation based cumulative hazard index. The inhalation based cumulative hazard index equals 1, which is at the guideline for facility-specific risk estimates, but does not exceed it.

Table 6 provides an overview of the modeling and risk results that determined the health endpoints that are screened into the CL&E Analysis. Table 7 identifies the data that is included in the CL&E analysis. A text description of this information follows the tables.

**Table 6. Determination of Health Endpoints for Further Study in the CL&E Analysis**

<b>Criteria Pollutant/Exposure Scenario</b>	<b>Design Value or Risk Estimate</b>	<b>CL&amp;E Screening Level</b>	<b>Further CL&amp;E Study?</b>	<b>Health Endpoints for Further Study in CL&amp;E</b>
PM10 - daily	3.1	5.0	No	
PM10 - annual	0.86	1.0	No	
PM2.5 - daily	2.05	1.2	Yes	Respiratory, cardiovascular
PM2.5 - annual	0.74	0.3	Yes	Respiratory, cardiovascular
CO - 1 hour	203.3	2000	No	
CO - 8 hour	75.1	500	No	
SO2 - 1 hour	1.49	7.8	No	
SO2 - 3 hour	0.54	25	No	
SO2 - 24 hour	0.29	5.0	No	
SO2 - annual	0.08	1.0	No	
NO2 - hourly	100.3	7.55	Yes	Respiratory
NO2 - annual	9.5	1.0	Yes	Respiratory
Lead - monthly	0.0007	0.15	No	
Acute inhalation	0.6	0.1	Yes	Respiratory
Urban Gardener Noncancer	0.02	0.1	No	
Urban Gardener Cancer	9.6E-7	1E-6	No	
Resident Noncancer	0.02	0.1	No	
Resident Cancer	7E-7	1E-6	No	

**Table 7. Environmental Health Data Associated with the Health Endpoints in the CL&E Analysis**

<b>Health Endpoint to be Studied</b>	<b>Environmental Health Data to Include in CL&amp;E</b>
All Health Endpoints	Facility specific operations, national and state air pollutant modeling, socio-economic data, percent population without health insurance, contributions from nearby sources
Respiratory	Asthma emergency room visits and hospitalizations, asthma capitals ranking, general risk factors, ambient air pollutant measurements, air modeling results, traffic density, tobacco smoke exposure, Air Quality Index (AQI) days
Cardiovascular	Cardiovascular hospitalizations

Existing community vulnerabilities were included in the CL&E analysis, including:

- asthma hospitalizations/emergency room visits,
- cardiovascular and stroke hospitalizations,
- socioeconomic status,
- population without health insurance, and
- general overall health risk factors.

Existing community stressors were included in the CL&E analysis, including:

- ambient air toxics measurements,
- ambient PM2.5 measurements,
- light duty and heavy duty traffic densities,
- tobacco smoke exposures,
- the South Minneapolis Residential Soil Contamination Site
- potential contributions from nearby sources,
- air quality index days,
- Minneapolis idling ordinance, and
- National and statewide modeled risk estimates.

In summary, the MPCA's permit review process for this permit action included meeting Minn. Stat. § 116.07, subd. 4a (CL&E analysis) requirements through the following:

- a. review of the potential impacts based on the worst-case emissions from the facility;
- b. review of available information describing the health and environmental conditions of the area, with a special focus on acute respiratory and cardiovascular events;
- c. consideration of the facility's potential impacts in the context of the existing health and environmental conditions in the area; and
- d. expanded community outreach.

#### Permit Requirements and the CL&E Analysis

The assumptions that were used as the basis for the CL&E analysis are included as requirements in the permit and are described in other parts of the TSD. Assumptions that are included in the permit include:

- modeling parameters (emission rates, exhaust parameters)
- limits on amount of fuel that may be used (boilers)
- limits on hours of operation (emergency generators)
- use of pollution control equipment on sterilizers
- testing of emergency generators one at a time

#### Community Outreach

As part of the Cumulative Levels and Effects process, the MPCA conducts expanded outreach, such as information sessions when an application is starting to be reviewed, email updates on the permitting process, attendance at neighborhood meetings, providing a website with detailed information about the CL&E process and permit applications, public meetings, and extended public comment periods. The specific community outreach activities associated with this facility and Minn. Stat. § 116.07, subd. 4a are described in Attachment 10 to this technical support document.



### 3.4 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 the facility violating the applicable requirements;
- Whether add-on controls are necessary to meet the emission limits;
- 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 elsewhere.

The table below summarizes the periodic monitoring requirements for those emission units for which the monitoring required by the applicable requirement is nonexistent or inadequate.

**Table 8. Periodic Monitoring**

Level*	Requirement (rule basis)	Additional Monitoring	Discussion
GP001 (Main Boilers)	Annual natural gas and No. 2 fuel oil usage limits (Limit to avoid NSR, Part 70)  PM: $\leq 0.4$ lb/MMBtu; Opacity: $\leq 20\%$ with exceptions (Minn. R. 7011.0510)	Recordkeeping: Monthly records and 12-month rolling sum calculation of natural gas and No. 2 fuel oil usage and Fuel Supplier Certification for sulfur content in diesel	Natural gas is the main fuel, with No. 2 fuel oil only used as a backup fuel during periods of natural gas curtailment or during maintenance/readiness testing. The fuel usage limits are set high enough that Abbott's heating needs can be met under all circumstances, therefore actual fuel usage is fairly low in comparison. Therefore, monthly records are adequate to ensure compliance with the limits.  For these units, based on the fuels used and EPA published emissions factors, it is highly unlikely that they could violate the Minn. R. 7011.0510 requirements. Since this is a permit condition, the semi-annual deviations report will document any deviations from this condition. Design based PM PTE for each unit, using AP-42, is 0.024 lb/MMBtu compared to the rule limit of 0.4 lb/MMBtu.

Level*	Requirement (rule basis)	Additional Monitoring	Discussion
GP003 (Heart Hospital Boilers)	Annual No. 2 fuel oil usage limits (Limit to avoid NSR, Part 70)  PM: $\leq 0.4$ lb/MMBtu; Opacity: $\leq 20\%$ with exceptions (Minn. R. 7011.0510)	Recordkeeping: Monthly records and 12-month rolling sum calculation of No. 2 fuel oil usage and Fuel Supplier Certification for sulfur content in diesel	Natural gas is the main fuel, with No. 2 fuel oil only used as a backup fuel during periods of natural gas curtailment or during maintenance/readiness testing. Therefore, No. 2 fuel oil usage is unlikely to exceed this limit. Monthly recordkeeping is adequate to assure compliance with the limit.  For these units, based on the fuels used and EPA published emissions factors, it is highly unlikely that they could violate the Minn. R. 7011.0510 requirements. Since this is a permit condition, the semi-annual deviations report will document any deviations from this condition. Design based PM PTE for each unit, using AP-42, is 0.024 lb/MMBtu compared to the rule limit of 0.4 lb/MMBtu.
GP001 (Main Boilers) and GP003 (Heart Hospital Boilers)	Gas-fired Boiler (40 CFR pt. 63, subp. JJJJJ)	None	The monitoring and recordkeeping of Subpart JJJJJ are adequate to demonstrate compliance.
GP002 (Emergency Generators 1-10) And EU027 (Emergency Generator)	$SO_2 \leq 0.50$ lb/MMBtu  Opacity: $\leq 20\%$ with exceptions (Minn. R. 7011.2300)	Recordkeeping: Monthly fuel usage and Fuel Supplier Certification for sulfur content in diesel	All units are limited to No. 2 fuel oil with a limit on sulfur content ( $\leq 0.0015\%$ by weight); therefore, it is unlikely a violation of these emission limits could occur.

Level*	Requirement (rule basis)	Additional Monitoring	Discussion
GP002 (Emergency Generators 1-10)  And EU027 (Emergency Generator)	Hours of operation less than 300 hours per year based on a 12 month rolling sum  (Limit to avoid NSR and Part 70)	Recordkeeping: hourly usage	Each GP002 generator and EU027 is for emergency use. The Permittee shall maintain documentation on-site that the unit is an emergency generator by design that qualifies under the EPA memorandum entitled "Calculating Potential to Emit (PTE) for Emergency Generators" dated September 6, 1995.
GP 004 (Natural Gas Boilers (10 <sup>th</sup> Ave Bldg/Garag e)	PM: $\leq 0.4$ lb/MMBtu; Opacity: $\leq 20\%$ with exceptions (Minn. R. 7011.0515)	Recordkeeping: Fuel records	All units use natural gas; therefore, the likelihood of violating either of the emission limits is very small. The Permittee can demonstrate that these units will continue to operate such that emissions are well below the emission limits by only burning natural gas. Since this is a permit condition, the semi-annual deviations report will document any deviations from this condition. Design based PTE for each unit, using AP-42, is 0.0072 compared to the rule limit of 0.4 lb/MMBtu.
GP005 (Ethylene Oxide Sterilizers and Abator)	Ethylene Oxide: Overall Control Efficiency of 99.9%  (Minn. Stat. § 116.07, subd 4a)	Inspections, O&M, Recordkeeping	Monitoring based on the Minnesota Performance Standard for Control Equipment is adequate to have a reasonable assurance of compliance (periodic inspections, corrective actions and O&M).

\*Where the requirement appears in the permit (e.g., EU, SV, GP, etc.).

### 3.5 Insignificant Activities

Abbott has several operations which are classified as insignificant activities under the MPCA's permitting rules. These are listed in Appendix I to the permit.

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 current insignificant activities. See Attachment 2 of this TSD for PTE information for the insignificant activities.

**Table 8. Insignificant Activities**

<b>Insignificant Activity</b>	<b>General Applicable Emission limit</b>	<b>Discussion</b>
Individual units with potential emissions less than 2000 lb/year of certain pollutants	PM, 0.4 lb/mmBTU Opacity $\leq$ 20% (with exceptions)  (Minn. R. 7011.510)	These are 2 natural gas combustion units. For the natural gas units, based on the fuels used and EPA published emissions factors, it is highly unlikely that they could violate the applicable requirement. Design based PTE for each unit, using AP-42, is 0.0072 compared to the rule limit of 0.4 lb/MMBtu.

### **3.3 Permit Organization**

In general, the permit meets the MPCA Delta Guidance for ordering and grouping of requirements. One area where this permit deviates slightly from Delta guidance is in the use of appendices. While appendices are fully enforceable parts of the permit, in general, any requirement that the MPCA thinks should be electronically tracked (e.g., limits, submittals, etc.), should be in Table A or B of the permit. The main reason is that the appendices are word processing sections and are not part of the electronic 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.

### **3.6 Comments Received**

Public Notice Period: December 7, 2012 – January 22, 2013

EPA 45-day Review Period: December 7, 2012 – January 22, 2013

A public meeting was held on January 8, 2013. Comments were not received from the public during the public notice period.

## **4. Permit Fee Assessment**

Attachment 4 to this TSD contains the MPCA's assessment of Application and Additional Points used to determine the permit application fee for this permit action as required by Minn. R. 7002.0019. The permit action includes one permit applications, received after the effective date of the rule (July 1, 2009). The application fee was paid at the time of receipt. The permit includes the incorporation of one NSPS (III) for a new emergency generator and an air emissions risk assessment (AERA), therefore additional points apply as shown on in Attachment 4. The modeling conducted for this permit action was part of the AERA, therefore, no additional points apply for the modeling. Although requirements for NESHAPs JJJJJ and WWWW have been included in the permit, these are for existing units that are not being modified; therefore, no additional points apply for these NESHAPs.

## 5. Conclusion

Based on the information provided by Abbott Northwestern Hospital, the MPCA has reasonable assurance that the proposed operation of the emission facility, as described in the Air Emission Permit No. 05300061-002 and this TSD, will not cause or contribute to a violation of applicable federal regulations and Minnesota Rules.

Staff Members on Permit Team:

- Sarah Sevcik (permit engineer)
- Kristie Ellickson (risk assessment)
- Greg Pratt (modeling)
- Cori Rude-Young (public information)
- Brent Rohne (enforcement)
- Toni Volkmeier (peer reviewer)

AQ File No. 253; DQ 3611

Attachments:

1. GI-07 (PTE Summary for the whole facility)
2. Detailed Calculation Spreadsheets
3. Facility Description and CD-01 Forms
4. Points Calculator
5. Air Quality Pollutant Modeling Protocol
6. Criteria Pollutant Modeling Protocol Review Form
7. Air Quality Dispersion Modeling Report
8. Cumulative Levels and Effects Analysis Report
9. Facility Specific Risk Analysis and Cumulative Levels and Effects Summary
10. Community Outreach Activities
11. Emergency Generator Test Plan

Abbott Northwestern Hospital  
Permit No. 05300061-002  
Technical Support Document

## Attachment 1

### GI-07 (PTE Summary for Facility)

1a) Facility ID 05300061  
 2) Facility Name Abbott Northwestern Hospital

3a)	3b)	3c) CAS	3c) CAS	3c) CAS	3c) CAS	3c) CAS	3c) CAS	3c) CAS	3c) CAS
Emission Source Type	Emission Source No.	3d Pollutant	PM	3e)	3f)	3d Pollutant	PM10	3d Pollutant	PM2.5
		lbs/hr	tpy	Unrestricted	Limited	tpy	Actual	lbs/hr	tpy
EU	001	0.68	2.99	2.99		2.09	N/A	0.32	1.41
EU	002	0.68	2.99	2.99		2.09	N/A	0.32	1.41
EU	003	0.68	2.99	2.99		2.09	N/A	0.32	1.41
EU	004	1.82	7.95			5.54	N/A	0.85	3.73
GP	001				3.24		N/A		2.58
EU	005	0.32	0.08	0.08	0.05	0.07	N/A	0.25	0.06
EU	006	0.32	0.08	0.08	0.05	0.07	N/A	0.25	0.06
EU	007	0.36	0.09	0.09	0.05	0.07	N/A	0.28	0.07
EU	008	0.36	0.09	0.09	0.05	0.07	N/A	0.28	0.07
EU	009	0.48	0.12	0.12	0.07	0.10	N/A	0.38	0.09
EU	010	0.74	0.19	0.19	0.11	0.19	N/A	0.74	0.19
EU	011	0.21	0.93			0.64	N/A	0.10	0.43
EU	012	0.21	0.93			0.64	N/A	0.10	0.43
EU	013	0.21	0.93			0.64	N/A	0.10	0.43
EU	014	0.21	0.93			0.64	N/A	0.10	0.43
GP	003				1.30		N/A		1.18
EU	015	0.43	0.11	0.11	0.07	0.09	N/A	0.35	0.09
EU	016	0.43	0.11	0.11	0.07	0.09	N/A	0.35	0.09
EU	017	0.43	0.11	0.11	0.07	0.09	N/A	0.35	0.09
EU	018	0.65	0.16	0.16	0.10	0.16	N/A	0.65	0.16
EU	019	0.03	0.13	0.13	0.13	0.13	N/A	0.03	0.13
EU	020	0.03	0.13	0.13	0.13	0.13	N/A	0.03	0.13
EU	021	0.02	0.10	0.10	0.10	0.10	N/A	0.02	0.10
EU	022	0.02	0.10	0.10	0.10	0.10	N/A	0.02	0.10
EU	023	0.02	0.10	0.10	0.10	0.10	N/A	0.02	0.10
EU	024	0.02	0.10	0.10	0.10	0.10	N/A	0.02	0.10
EU	025	0.01	0.06	0.06	0.06	0.06	N/A	0.01	0.06
EU	026	0.01	0.06	0.06	0.06	0.06	N/A	0.01	0.06
EU	028	0.02	0.10	0.10	0.10	0.10	N/A	0.02	0.10
EU	027	0.23	0.06	0.06	0.03	0.06	N/A	0.23	0.06

4)	Potential	Actual	Potential	Actual	Potential	Actual
Total	Unrestricted	Limited	Unrestricted	Limited	Unrestricted	Limited
Facility	22.7	6.1	16.3	5.6	11.6	5.3

05300061

[illegible]



05300061

Abbott Northwestern Hospital

3c) CAS		3c) CAS		3c) CAS		3c) CAS		3c) CAS		75-07-0	
3d Pollutant		VOC		3d Pollutant		Greenhouse Gas (CO2e)		3d Pollutant		Acetaldehyde	
lbs/hr	3e) Potential		3f) Actual		lbs/hr	Potential		tpy	Actual		Actual
	Unrestricted	Limited	tpy	tpy		Unrestricted	Limited		Unrestricted	Limited	
0.16	0.68		N/A	4,677	20,484			N/A			tpy
0.16	0.68		N/A	4,677	20,484			N/A			N/A
0.16	0.68		N/A	4,677	20,484			N/A			N/A
0.42	1.82		N/A	12,417	54,388			N/A			N/A
		1.65	N/A			40,096		N/A			N/A
0.41	0.10	0.06	N/A	745	186	112		N/A	8.20E-07	2.05E-07	1.23E-07
0.41	0.00	0.06	N/A	745	186	112		N/A	8.20E-07	2.05E-07	1.23E-07
0.46	0.12	0.07	N/A	839	210	126		N/A	9.23E-07	2.31E-07	1.38E-07
0.46	0.12	0.07	N/A	839	210	126		N/A	9.23E-07	2.31E-07	1.38E-07
0.62	0.15	0.09	N/A	1,118	279	168		N/A	1.23E-06	3.08E-07	1.85E-07
0.84	0.21	0.13	N/A	391	98	59		N/A	4.31E-07	1.08E-07	6.46E-08
0.05	0.21		N/A	1,445	6,329			N/A			N/A
0.05	0.21		N/A	1,445	6,329			N/A			N/A
0.05	0.21		N/A	1,445	6,329			N/A			N/A
		0.83	N/A			18,505		N/A			N/A
0.56	0.14	0.08	N/A	1,019	255	153		N/A	1.12E-06	2.80E-07	1.68E-07
0.56	0.14	0.08	N/A	1,019	255	153		N/A	1.12E-06	2.80E-07	1.68E-07
0.56	0.14	0.08	N/A	1,019	255	153		N/A	1.12E-06	2.80E-07	1.68E-07
0.73	0.18	0.11	N/A	343	86	51		N/A	3.77E-07	9.44E-08	5.66E-08
0.02	0.10	0.10	N/A	481	2,107	2,107		N/A			N/A
0.02	0.10	0.10	N/A	481	2,107	2,107		N/A			N/A
0.02	0.07	0.07	N/A	361	1,580	1,580		N/A			N/A
0.02	0.07	0.07	N/A	361	1,580	1,580		N/A			N/A
0.02	0.07	0.07	N/A	361	1,580	1,580		N/A			N/A
0.02	0.07	0.07	N/A	361	1,580	1,580		N/A			N/A
0.01	0.04	0.04	N/A	201	882	882		N/A			N/A
0.01	0.04	0.04	N/A	201	882	882		N/A			N/A
0.02	0.07	0.07	N/A	361	1,580	1,580		N/A			N/A
0.93	0.23	0.14	N/A	3,161	790	474		N/A	3.48E-06	8.69E-07	5.22E-07

Potential		Actual		Potential		Actual		Potential		Actual	
Unrestricted		Limited	tpy	Unrestricted		Limited	tpy	Unrestricted		Limited	tpy
6.9		4.1		157845.6		74168.1		3.1E-06		1.9E-06	

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3c) CAS		107-02-8		3c) CAS		71-43-2		3c) CAS		25321-22-6	
3d Pollutant		Acrolein		3d Pollutant		Benzene		3d Pollutant		Dichlorobenzene	
Potential		Actual		Potential		Actual		Potential		Actual	
lbs/hr	Unrestricted	Limited	tpy	lbs/hr	Unrestricted	Limited	tpy	lbs/hr	Unrestricted	Limited	tpy
			N/A	5.97E-05	2.62E-04		N/A	3.41E-05	1.49E-04		N/A
			N/A	5.97E-05	2.62E-04		N/A	3.41E-05	1.49E-04		N/A
			N/A	5.97E-05	2.62E-04		N/A	3.41E-05	1.49E-04		N/A
			N/A	1.59E-04	6.94E-04		N/A	9.06E-05	3.97E-04		N/A
			N/A			6.32E-04	N/A			3.15E-04	N/A
2.56E-07	6.41E-08	3.85E-08	N/A	3.54E-03	8.84E-04	5.30E-04	N/A				N/A
2.56E-07	6.41E-08	3.85E-08	N/A	3.54E-03	8.84E-04	5.30E-04	N/A				N/A
2.88E-07	7.21E-08	4.33E-08	N/A	3.98E-03	9.94E-04	5.97E-04	N/A				N/A
2.88E-07	7.21E-08	4.33E-08	N/A	3.98E-03	9.94E-04	5.97E-04	N/A				N/A
3.85E-07	9.62E-08	5.77E-08	N/A	5.30E-03	1.33E-03	7.95E-04	N/A				N/A
1.35E-07	3.37E-08	2.02E-08	N/A	1.86E-03	4.64E-04	2.78E-04	N/A				N/A
			N/A	1.80E-05	7.88E-05		N/A	1.03E-05	4.50E-05		N/A
			N/A	1.80E-05	7.88E-05		N/A	1.03E-05	4.50E-05		N/A
			N/A	1.80E-05	7.88E-05		N/A	1.03E-05	4.50E-05		N/A
			N/A	1.80E-05	7.88E-05		N/A	1.03E-05	4.50E-05		N/A
3.51E-07	8.77E-08	5.26E-08	N/A	4.83E-03	1.21E-03	7.25E-04	N/A			1.80E-04	N/A
3.51E-07	8.77E-08	5.26E-08	N/A	4.83E-03	1.21E-03	7.25E-04	N/A				N/A
3.51E-07	8.77E-08	5.26E-08	N/A	4.83E-03	1.21E-03	7.25E-04	N/A				N/A
1.18E-07	2.95E-08	1.77E-08	N/A	1.63E-03	4.07E-04	2.44E-04	N/A				N/A
			N/A	8.40E-06	3.68E-05	3.68E-05	N/A	4.80E-06	2.10E-05	2.10E-05	N/A
			N/A	8.40E-06	3.68E-05	3.68E-05	N/A	4.80E-06	2.10E-05	2.10E-05	N/A
			N/A	6.30E-06	2.76E-05	2.76E-05	N/A	3.60E-06	1.58E-05	1.58E-05	N/A
			N/A	6.30E-06	2.76E-05	2.76E-05	N/A	3.60E-06	1.58E-05	1.58E-05	N/A
			N/A	6.30E-06	2.76E-05	2.76E-05	N/A	3.60E-06	1.58E-05	1.58E-05	N/A
			N/A	3.52E-06	1.54E-05	1.54E-05	N/A	2.01E-06	8.80E-06	8.80E-06	N/A
			N/A	3.52E-06	1.54E-05	1.54E-05	N/A	2.01E-06	8.80E-06	8.80E-06	N/A
			N/A	6.30E-06	2.76E-05	2.76E-05	N/A	3.60E-06	1.58E-05	1.58E-05	N/A
1.09E-06	2.72E-07	1.63E-07	N/A	1.50E-02	3.75E-03	2.25E-03	N/A				N/A
Potential		Actual		Potential		Actual		Potential		Actual	
Unrestricted	Limited	tpy	tpy	Unrestricted	Limited	tpy	tpy	Unrestricted	Limited	tpy	tpy
9.7E-07	5.8E-07			1.5E-02	9.2E-03				1.2E-03	6.3E-04	

Abbott Northwestern Hospital

3c) CAS		100-41-4		3c) CAS		50-00-0		3c) CAS		110-54-3	
3d Pollutant		Ethylbenzene		3d Pollutant		Formaldehyde		3d Pollutant		Hexane	
Potential		Actual		Potential		Actual		Potential		Actual	
lbs/hr	Unrestricted	Limited	tpy	lbs/hr	Unrestricted	Limited	tpy	lbs/hr	Unrestricted	Limited	tpy
1.32E-05	5.77E-05		N/A	6.84E-03	2.99E-02		N/A	5.12E-02	2.24E-01		N/A
1.32E-05	5.77E-05		N/A	6.84E-03	2.99E-02		N/A	5.12E-02	2.24E-01		N/A
1.32E-05	5.77E-05		N/A	6.84E-03	2.99E-02		N/A	5.12E-02	2.24E-01		N/A
3.50E-05	1.53E-04		N/A	1.82E-02	7.95E-02		N/A	1.36E-01	5.95E-01		N/A
		2.40E-05	N/A				N/A			4.73E-01	N/A
			N/A	3.59E-04	8.99E-05	5.39E-05	N/A				N/A
			N/A	3.59E-04	8.99E-05	5.39E-05	N/A				N/A
			N/A	4.04E-04	1.01E-04	6.07E-05	N/A				N/A
			N/A	4.04E-04	1.77E-03	6.07E-05	N/A				N/A
			N/A	5.39E-04	1.35E-04	8.09E-05	N/A				N/A
			N/A	1.89E-04	4.72E-05	2.83E-05	N/A				N/A
4.07E-06	1.78E-05		N/A	2.11E-03	9.25E-03		N/A	1.54E-02	6.76E-02		N/A
4.07E-06	1.78E-05		N/A	2.11E-03	9.25E-03		N/A	1.54E-02	6.76E-02		N/A
4.07E-06	1.78E-05		N/A	2.11E-03	9.25E-03		N/A	1.54E-02	6.76E-02		N/A
4.07E-06	1.78E-05		N/A	2.11E-03	9.25E-03		N/A	1.54E-02	6.76E-02		N/A
		4.36E-06	N/A	4.92E-04	1.23E-04	1.28E-02	N/A			2.70E-01	N/A
			N/A	4.92E-04	1.23E-04	7.37E-05	N/A				N/A
			N/A	4.92E-04	1.23E-04	7.37E-05	N/A				N/A
			N/A	4.92E-04	1.23E-04	7.37E-05	N/A				N/A
			N/A	1.65E-04	4.14E-05	2.48E-05	N/A				N/A
			N/A	3.00E-04	1.31E-03	1.31E-03	N/A	7.20E-03	3.15E-02	3.15E-02	N/A
			N/A	3.00E-04	1.31E-03	1.31E-03	N/A	7.20E-03	3.15E-02	3.15E-02	N/A
			N/A	2.25E-04	9.86E-04	9.86E-04	N/A	5.40E-03	2.37E-02	2.37E-02	N/A
			N/A	2.25E-04	9.86E-04	9.86E-04	N/A	5.40E-03	2.37E-02	2.37E-02	N/A
			N/A	2.25E-04	9.86E-04	9.86E-04	N/A	5.40E-03	2.37E-02	2.37E-02	N/A
			N/A	1.26E-04	5.50E-04	5.50E-04	N/A	3.02E-03	1.32E-02	1.32E-02	N/A
			N/A	1.26E-04	5.50E-04	5.50E-04	N/A	3.02E-03	1.32E-02	1.32E-02	N/A
			N/A	2.25E-04	9.86E-04	9.86E-04	N/A	5.40E-03	2.37E-02	2.37E-02	N/A
			N/A	1.52E-03	3.81E-04	2.29E-04	N/A	0.00E+00	0.00E+00	0.00E+00	N/A
Potential		Actual		Potential		Actual		Potential		Actual	
Unrestricted	Limited		tpy	Unrestricted	Limited		tpy	Unrestricted	Limited		tpy
4.0E-04	2.8E-05			2.2E-01	5.4E-02			1.7E+00	9.5E-01		

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3c) CAS 91-20-3			3c) CAS 71-55-6			3c) CAS 108-88-3					
3d Pollutant Naphthalene			3d Pollutant 1,1,1-Trichloroethane			3d Pollutant Toluene					
Potential			Potential			Potential					
lbs/hr	Unrestricted	Limited	Actual	lbs/hr	Unrestricted	Limited	Actual	lbs/hr	Unrestricted	Limited	Actual
2.34E-04	1.03E-03	tpy	N/A	4.89E-05	2.14E-04	tpy	N/A	1.28E-03	5.63E-03	tpy	N/A
2.34E-04	1.03E-03	tpy	N/A	4.89E-05	2.14E-04	tpy	N/A	1.28E-03	5.63E-03	tpy	N/A
2.34E-04	1.03E-03	tpy	N/A	4.89E-05	2.14E-04	tpy	N/A	1.28E-03	5.63E-03	tpy	N/A
6.22E-04	2.72E-03	tpy	N/A	1.30E-04	5.69E-04	tpy	N/A	3.41E-03	1.49E-02	tpy	N/A
		tpy	N/A			tpy	N/A			tpy	N/A
5.92E-04	1.48E-04	tpy	N/A	8.88E-05		tpy	N/A	1.28E-03	3.20E-04	tpy	N/A
5.92E-04	1.48E-04	tpy	N/A	8.88E-05		tpy	N/A	1.28E-03	3.20E-04	tpy	N/A
6.66E-04	1.67E-04	tpy	N/A	9.99E-05		tpy	N/A	1.44E-03	3.60E-04	tpy	N/A
6.66E-04	1.67E-04	tpy	N/A	9.99E-05		tpy	N/A	1.44E-03	3.60E-04	tpy	N/A
8.88E-04	2.22E-04	tpy	N/A	1.33E-04		tpy	N/A	1.92E-03	4.80E-04	tpy	N/A
3.11E-04	7.78E-05	tpy	N/A	4.67E-05		tpy	N/A	6.72E-04	1.68E-04	tpy	N/A
7.23E-05	3.17E-04	tpy	N/A	1.51E-05	6.62E-05	tpy	N/A	3.97E-04	1.74E-03	tpy	N/A
7.23E-05	3.17E-04	tpy	N/A	1.51E-05	6.62E-05	tpy	N/A	3.97E-04	1.74E-03	tpy	N/A
7.23E-05	3.17E-04	tpy	N/A	1.51E-05	6.62E-05	tpy	N/A	3.97E-04	1.74E-03	tpy	N/A
7.23E-05	3.17E-04	tpy	N/A	1.51E-05	6.62E-05	tpy	N/A	3.97E-04	1.74E-03	tpy	N/A
8.10E-04	2.02E-04	tpy	N/A	1.21E-04		tpy	N/A	1.75E-03	4.38E-04	tpy	N/A
8.10E-04	2.02E-04	tpy	N/A	1.21E-04		tpy	N/A	1.75E-03	4.38E-04	tpy	N/A
8.10E-04	2.02E-04	tpy	N/A	1.21E-04		tpy	N/A	1.75E-03	4.38E-04	tpy	N/A
2.73E-04	6.81E-05	tpy	N/A	4.09E-05		tpy	N/A	5.89E-04	1.47E-04	tpy	N/A
2.44E-06	1.07E-05	tpy	N/A	1.07E-05		tpy	N/A	1.36E-05	5.96E-05	tpy	N/A
2.44E-06	1.07E-05	tpy	N/A	1.07E-05		tpy	N/A	1.36E-05	5.96E-05	tpy	N/A
1.83E-06	8.02E-06	tpy	N/A	8.02E-06		tpy	N/A	1.02E-05	4.47E-05	tpy	N/A
1.83E-06	8.02E-06	tpy	N/A	8.02E-06		tpy	N/A	1.02E-05	4.47E-05	tpy	N/A
1.83E-06	8.02E-06	tpy	N/A	8.02E-06		tpy	N/A	1.02E-05	4.47E-05	tpy	N/A
1.83E-06	8.02E-06	tpy	N/A	8.02E-06		tpy	N/A	1.02E-05	4.47E-05	tpy	N/A
1.02E-06	4.48E-06	tpy	N/A	4.48E-06		tpy	N/A	5.70E-06	2.49E-05	tpy	N/A
1.02E-06	4.48E-06	tpy	N/A	4.48E-06		tpy	N/A	5.70E-06	2.49E-05	tpy	N/A
1.83E-06	8.02E-06	tpy	N/A	8.02E-06		tpy	N/A	1.02E-05	4.47E-05	tpy	N/A
2.51E-03	6.28E-04	tpy	N/A	3.77E-04		tpy	N/A	5.43E-03	1.36E-03	tpy	N/A

Potential			Potential			Potential		
Unrestricted	Limited	Actual	Unrestricted	Limited	Actual	Unrestricted	Limited	Actual
9.4E-03	2.2E-03	tpy	1.5E-03	1.1E-04	tpy	5.0E-02	7.4E-03	tpy

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3c) CAS						3c) CAS			3c) CAS		
1332-20-7						83-32-9			203-96-8		
3d Pollutant Xylene (o,m,p)						3d Pollutant Acenaphthene			3d Pollutant Acenaphthylene		
Potential			Actual			Potential			Actual		
lbs/hr	Unrestricted tpy	Limited tpy	tpy	lbs/hr	Unrestricted tpy	Limited tpy	tpy	lbs/hr	Unrestricted tpy	Limited tpy	tpy
2.26E-05	9.89E-05		N/A	4.37E-06	1.91E-05		N/A	5.24E-08	2.30E-07		tpy N/A
2.26E-05	9.89E-05		N/A	4.37E-06	1.91E-05		N/A	5.24E-08	2.30E-07		N/A
2.26E-05	9.89E-05		N/A	4.37E-06	1.91E-05		N/A	5.24E-08	2.30E-07		N/A
6.00E-05	2.63E-04		N/A	1.16E-05	5.08E-05		N/A	1.39E-07	6.09E-07		N/A
		4.11E-05	N/A			8.44E-06	N/A			5.68E-07	N/A
8.79E-04	2.20E-04	1.32E-04	N/A	2.13E-05	5.33E-06	3.20E-06	N/A	4.20E-05	1.05E-05	6.31E-06	N/A
8.79E-04	2.20E-04	1.32E-04	N/A	2.13E-05	5.33E-06	3.20E-06	N/A	4.20E-05	1.05E-05	6.31E-06	N/A
9.89E-04	2.47E-04	1.48E-04	N/A	2.40E-05	6.00E-06	3.60E-06	N/A	4.73E-05	1.18E-05	7.10E-06	N/A
9.89E-04	2.47E-04	1.48E-04	N/A	2.40E-05	6.00E-06	3.60E-06	N/A	4.73E-05	1.18E-05	7.10E-06	N/A
1.32E-03	3.30E-04	1.98E-04	N/A	3.20E-05	8.00E-06	4.80E-06	N/A	6.31E-05	1.58E-05	9.46E-06	N/A
4.62E-04	1.15E-04	6.93E-05	N/A	1.12E-05	2.80E-06	1.68E-06	N/A	2.21E-05	5.52E-06	3.31E-06	N/A
6.98E-06	3.06E-05		N/A	1.35E-06	5.91E-06		N/A	1.62E-08	7.09E-08		N/A
6.98E-06	3.06E-05		N/A	1.35E-06	5.91E-06		N/A	1.62E-08	7.09E-08		N/A
6.98E-06	3.06E-05		N/A	1.35E-06	5.91E-06		N/A	1.62E-08	7.09E-08		N/A
		7.47E-06	N/A			1.70E-06	N/A			2.71E-07	N/A
1.20E-03	3.01E-04	1.80E-04	N/A	2.92E-05	7.29E-06	4.37E-06	N/A	5.75E-05	1.44E-05	8.63E-06	N/A
1.20E-03	3.01E-04	1.80E-04	N/A	2.92E-05	7.29E-06	4.37E-06	N/A	5.75E-05	1.44E-05	8.63E-06	N/A
1.20E-03	3.01E-04	1.80E-04	N/A	2.92E-05	7.29E-06	4.37E-06	N/A	5.75E-05	1.44E-05	8.63E-06	N/A
4.05E-04	1.01E-04	6.07E-05	N/A	9.81E-06	2.45E-06	1.47E-06	N/A	1.94E-05	4.84E-06	2.90E-06	N/A
			N/A	7.20E-09	3.15E-08	3.15E-08	N/A	7.20E-09	3.15E-08	3.15E-08	N/A
			N/A	7.20E-09	3.15E-08	3.15E-08	N/A	7.20E-09	3.15E-08	3.15E-08	N/A
			N/A	5.40E-09	2.37E-08	2.37E-08	N/A	5.40E-09	2.37E-08	2.37E-08	N/A
			N/A	5.40E-09	2.37E-08	2.37E-08	N/A	5.40E-09	2.37E-08	2.37E-08	N/A
			N/A	5.40E-09	2.37E-08	2.37E-08	N/A	5.40E-09	2.37E-08	2.37E-08	N/A
			N/A	3.02E-09	1.32E-08	1.32E-08	N/A	3.02E-09	1.32E-08	1.32E-08	N/A
			N/A	3.02E-09	1.32E-08	1.32E-08	N/A	3.02E-09	1.32E-08	1.32E-08	N/A
			N/A	5.40E-09	2.37E-08	2.37E-08	N/A	5.40E-09	2.37E-08	2.37E-08	N/A
3.73E-03	9.32E-04	5.59E-04	N/A	9.04E-05	2.26E-05	1.36E-05	N/A	1.78E-04	4.46E-05	2.67E-05	N/A
Potential			Actual			Potential			Actual		
Unrestricted	Limited	tpy	tpy	Unrestricted	Potential	Limited	tpy	Unrestricted	Potential	Limited	tpy
4.0E-03	2.0E-03			2.1E-04	5.9E-05			1.6E-04	9.6E-05		

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3c) CAS 120-12-7				3c) CAS 56-55-3				3c) CAS 50-32-8			
3d Pollutant Anthracene				3d Pollutant Benz(a)anthracene				3d Pollutant Benzo(a)pyrene			
Potential		Actual		Potential		Actual		Potential		Actual	
lbs/hr	Unrestricted	Limited	tpy	lbs/hr	Unrestricted	Limited	tpy	lbs/hr	Unrestricted	Limited	tpy
2.53E-07	1.11E-06		N/A	8.31E-07	3.64E-06		N/A	3.41E-08	1.49E-07		N/A
2.53E-07	1.11E-06		N/A	8.31E-07	3.64E-06		N/A	3.41E-08	1.49E-07		N/A
2.53E-07	1.11E-06		N/A	8.31E-07	3.64E-06		N/A	3.41E-08	1.49E-07		N/A
6.71E-07	2.94E-06		N/A	2.21E-06	9.66E-06		N/A	9.06E-08	3.97E-07		N/A
		1.09E-06	N/A			1.99E-06	N/A			3.15E-07	N/A
5.60E-06	1.40E-06	8.41E-07	N/A	2.83E-06	7.08E-07	4.25E-07	N/A	1.17E-06	1.76E-09	1.76E-07	N/A
5.60E-06	1.40E-06	8.41E-07	N/A	2.83E-06	7.08E-07	4.25E-07	N/A	1.17E-06	2.93E-07	1.76E-07	N/A
6.30E-06	1.58E-06	9.46E-07	N/A	3.19E-06	7.97E-07	4.78E-07	N/A	1.32E-06	3.29E-07	1.98E-07	N/A
6.30E-06	1.58E-06	9.46E-07	N/A	3.19E-06	7.97E-07	4.78E-07	N/A	1.32E-06	3.29E-07	1.98E-07	N/A
8.41E-06	2.10E-06	1.26E-06	N/A	4.25E-06	1.06E-06	6.38E-07	N/A	1.76E-06	4.39E-07	2.63E-07	N/A
2.94E-06	7.36E-07	4.41E-07	N/A	1.49E-06	3.72E-07	2.23E-07	N/A	6.15E-07	1.54E-07	9.22E-08	N/A
7.81E-08	3.42E-07		N/A	2.57E-07	1.12E-06		N/A	1.03E-08	4.50E-08		N/A
7.81E-08	3.42E-07		N/A	2.57E-07	1.12E-06		N/A	1.03E-08	4.50E-08		N/A
7.81E-08	3.42E-07		N/A	2.57E-07	1.12E-06		N/A	1.03E-08	4.50E-08		N/A
		4.22E-07	N/A			5.28E-07	N/A			1.80E-07	N/A
7.66E-06	1.92E-06	1.15E-06	N/A	3.88E-06	9.69E-07	5.81E-07	N/A	1.60E-06	4.00E-07	2.40E-07	N/A
7.66E-06	1.92E-06	1.15E-06	N/A	3.88E-06	9.69E-07	5.81E-07	N/A	1.60E-06	7.01E-06	2.40E-07	N/A
7.66E-06	1.92E-06	1.15E-06	N/A	3.88E-06	9.69E-07	5.81E-07	N/A	1.60E-06	7.01E-06	2.40E-07	N/A
2.58E-06	6.45E-07	3.87E-07	N/A	1.30E-06	3.26E-07	1.96E-07	N/A	5.39E-07	1.35E-07	8.08E-08	N/A
9.60E-09	4.20E-08	4.20E-08	N/A	7.20E-09	3.15E-08	3.15E-08	N/A	4.80E-09	2.10E-08	2.10E-08	N/A
9.60E-09	4.20E-08	4.20E-08	N/A	7.20E-09	3.15E-08	3.15E-08	N/A	4.80E-09	2.10E-08	2.10E-08	N/A
7.20E-09	3.15E-08	3.15E-08	N/A	5.40E-09	2.37E-08	2.37E-08	N/A	3.60E-09	1.58E-08	1.58E-08	N/A
7.20E-09	3.15E-08	3.15E-08	N/A	5.40E-09	2.37E-08	2.37E-08	N/A	3.60E-09	1.58E-08	1.58E-08	N/A
7.20E-09	3.15E-08	3.15E-08	N/A	5.40E-09	2.37E-08	2.37E-08	N/A	3.60E-09	1.58E-08	1.58E-08	N/A
4.02E-09	1.76E-08	1.76E-08	N/A	3.02E-09	1.32E-08	1.32E-08	N/A	2.01E-09	8.80E-09	8.80E-09	N/A
4.02E-09	1.76E-08	1.76E-08	N/A	3.02E-09	1.32E-08	1.32E-08	N/A	2.01E-09	8.80E-09	8.80E-09	N/A
7.20E-09	3.15E-08	3.15E-08	N/A	5.40E-09	2.37E-08	2.37E-08	N/A	3.60E-09	1.58E-08	1.58E-08	N/A
2.38E-05	5.94E-06	3.56E-06	N/A	1.20E-05	3.00E-06	1.80E-06	N/A	4.97E-06	1.24E-06	7.45E-07	N/A
Potential		Actual		Potential		Actual		Potential		Actual	
Unrestricted	Limited	tpy		Unrestricted	Limited	tpy		Unrestricted	Limited	tpy	
2.9E-05	1.4E-05			3.6E-05	9.1E-06				1.9E-05	3.3E-06	

	Potential	Actual	Potential	Actual	Potential	Actual
	Unrestricted	Limited	Unrestricted	Limited	Unrestricted	Limited
	2.9E-05	1.4E-05		3.6E-05	9.1E-06	1.9E-05
						3.3E-06



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3c) CAS		205-82-3		3c) CAS		218-01-9		3c) CAS		53-70-3	
3d Pollutant		Benzo(k)fluoranthene		3d Pollutant		Chrysene		3d Pollutant		Dibenzo(a,h)anthracene	
Potential		Potential		Actual		Potential		Actual		Potential	
lbs/hr	Unrestricted tpy	Limited tpy	Unrestricted tpy	lbs/hr	tpy	Limited tpy	Unrestricted tpy	lbs/hr	tpy	Unrestricted tpy	Limited tpy
5.12E-08	2.24E-07			4.93E-07	2.16E-06			3.46E-07	N/A	1.52E-06	
5.12E-08	2.24E-07			4.93E-07	2.16E-06			3.46E-07	N/A	1.52E-06	
5.12E-08	2.24E-07			4.93E-07	2.16E-06			3.46E-07	N/A	1.52E-06	
1.36E-07	5.95E-07			1.31E-06	5.73E-06			9.19E-07	N/A	4.02E-06	
		4.73E-07				1.37E-06			N/A		9.45E-07
9.93E-07	1.49E-09	1.49E-07		6.97E-06	1.74E-06	1.05E-06		1.58E-06	N/A	3.94E-07	2.36E-07
9.93E-07	2.48E-07	1.49E-07		6.97E-06	1.74E-06	1.05E-06		1.58E-06	N/A	3.94E-07	2.36E-07
1.12E-06	4.89E-06	2.79E-07		7.84E-06	1.96E-06	1.18E-06		1.77E-06	N/A	4.43E-07	2.66E-07
1.12E-06	4.89E-06	1.68E-07		7.84E-06	3.43E-05	1.18E-06		1.77E-06	N/A	7.77E-06	2.66E-07
1.49E-06	3.72E-07	2.23E-07		1.05E-05	2.61E-06	1.57E-06		2.36E-06	N/A	5.91E-07	3.55E-07
5.22E-07	1.30E-07	7.82E-08		3.66E-06	9.15E-07	5.49E-07		8.28E-07	N/A	2.07E-07	1.24E-07
1.54E-08	6.76E-08			1.52E-07	6.67E-07			1.07E-07	N/A	4.68E-07	
1.54E-08	6.76E-08			1.52E-07	6.67E-07			1.07E-07	N/A	4.68E-07	
1.54E-08	6.76E-08			1.52E-07	6.67E-07			1.07E-07	N/A	4.68E-07	
									N/A		
		2.70E-07				4.17E-07			N/A		2.84E-07
1.36E-06	3.40E-07	2.04E-07		9.53E-06	1.43E-08	1.43E-06		2.16E-06	N/A	5.39E-07	3.23E-07
1.36E-06	3.40E-07	2.04E-07		9.53E-06	4.17E-05	1.43E-06		2.16E-06	N/A	5.39E-07	3.23E-07
1.36E-06	3.40E-07	2.04E-07		9.53E-06	4.17E-05	1.43E-06		2.16E-06	N/A	5.39E-07	3.23E-07
4.57E-07	1.14E-07	6.86E-08		3.21E-06	8.02E-07	4.81E-07		7.25E-07	N/A	1.81E-07	1.09E-07
7.20E-09	3.15E-08	3.15E-08		7.20E-09	3.15E-08	3.15E-08		4.80E-09	N/A	2.10E-08	2.10E-08
7.20E-09	3.15E-08	3.15E-08		7.20E-09	3.15E-08	3.15E-08		4.80E-09	N/A	2.10E-08	2.10E-08
5.40E-09	2.37E-08	2.37E-08		5.40E-09	2.37E-08	2.37E-08		3.60E-09	N/A	1.58E-08	1.58E-08
5.40E-09	2.37E-08	2.37E-08		5.40E-09	2.37E-08	2.37E-08		3.60E-09	N/A	1.58E-08	1.58E-08
5.40E-09	2.37E-08	2.37E-08		5.40E-09	2.37E-08	2.37E-08		3.60E-09	N/A	1.58E-08	1.58E-08
5.40E-09	2.37E-08	2.37E-08		5.40E-09	2.37E-08	2.37E-08		3.60E-09	N/A	1.58E-08	1.58E-08
5.40E-09	2.37E-08	2.37E-08		5.40E-09	2.37E-08	2.37E-08		3.60E-09	N/A	1.58E-08	1.58E-08
3.02E-09	1.32E-08	1.32E-08		3.02E-09	1.32E-08	1.32E-08		2.01E-09	N/A	8.80E-09	8.80E-09
3.02E-09	1.32E-08	1.32E-08		3.02E-09	1.32E-08	1.32E-08		2.01E-09	N/A	8.80E-09	8.80E-09
5.40E-09	2.37E-08	2.37E-08		5.40E-09	2.37E-08	2.37E-08		3.60E-09	N/A	1.58E-08	1.58E-08
4.21E-06	1.05E-06	6.32E-07		2.96E-05	7.39E-06	4.43E-06		6.68E-06	N/A	1.67E-06	1.00E-06
									N/A		
									N/A		
Potential		Potential		Actual		Potential		Actual		Potential	
Unrestricted	Limited	Limited	Unrestricted	Unrestricted	tpy	Limited	Unrestricted	Unrestricted	tpy	Limited	tpy
1.4E-05	3.3E-06		1.5E-04	1.5E-04		1.8E-05				2.4E-05	4.9E-06



05300061 Abbott Northwestern Hospital				05300061 Abbott Northwestern Hospital				05300061 Abbott Northwestern Hospital			
3c) CAS 57-97-6				3c) CAS 206-44-0				3c) CAS 86-73-7			
3d Pollutant 7,12-Dimethylbenz(a)anthracene				3d Pollutant Fluoranthene				3d Pollutant Fluorene			
Potential		Actual		Potential		Actual		Potential		Actual	
lbs/hr	Unrestricted	Limited	tpy	lbs/hr	Unrestricted	Limited	tpy	lbs/hr	Unrestricted	Limited	tpy
4.55E-07	1.99E-06		N/A	1.00E-06	4.39E-06		N/A	9.26E-07	4.06E-06		N/A
4.55E-07	1.99E-06		N/A	1.00E-06	4.39E-06		N/A	9.26E-07	4.06E-06		N/A
4.55E-07	1.99E-06		N/A	1.00E-06	4.39E-06		N/A	9.26E-07	4.06E-06		N/A
1.21E-06	5.29E-06		N/A	2.66E-06	1.17E-05		N/A	2.46E-06	1.08E-05		N/A
		4.20E-06	N/A			2.61E-06	N/A			2.42E-06	N/A
			N/A	1.84E-05	4.59E-06	2.75E-06	N/A	5.83E-05	1.46E-05	8.75E-06	N/A
			N/A	1.84E-05	4.59E-06	2.75E-06	N/A	5.83E-05	1.46E-05	8.75E-06	N/A
			N/A	2.07E-05	5.16E-06	3.10E-06	N/A	6.56E-05	1.64E-05	9.84E-06	N/A
			N/A	2.07E-05	5.16E-06	3.10E-06	N/A	6.56E-05	2.87E-04	9.84E-06	N/A
			N/A	2.75E-05	6.88E-06	4.13E-06	N/A	8.75E-05	2.19E-05	1.31E-05	N/A
			N/A	9.64E-06	2.41E-06	1.45E-06	N/A	3.06E-05	7.66E-06	4.59E-06	N/A
1.37E-07	6.01E-07		N/A	3.10E-07	1.36E-06		N/A	2.86E-07	1.25E-06		N/A
1.37E-07	6.01E-07		N/A	3.10E-07	1.36E-06		N/A	2.86E-07	1.25E-06		N/A
1.37E-07	6.01E-07		N/A	3.10E-07	1.36E-06		N/A	2.86E-07	1.25E-06		N/A
		2.40E-06	N/A			7.55E-07	N/A			7.01E-07	N/A
			N/A	2.51E-05	6.28E-06	3.77E-06	N/A	7.97E-05	1.99E-05	1.20E-05	N/A
			N/A	2.51E-05	6.28E-06	3.77E-06	N/A	7.97E-05	1.99E-05	1.20E-05	N/A
			N/A	2.51E-05	6.28E-06	3.77E-06	N/A	7.97E-05	1.99E-05	1.20E-05	N/A
			N/A	8.45E-06	2.11E-06	1.27E-06	N/A	2.68E-05	6.71E-06	4.03E-06	N/A
6.40E-08	2.80E-07	2.80E-07	N/A	1.20E-08	5.26E-08	5.26E-08	N/A	1.12E-08	4.91E-08	4.91E-08	N/A
6.40E-08	2.80E-07	2.80E-07	N/A	1.20E-08	5.26E-08	5.26E-08	N/A	1.12E-08	4.91E-08	4.91E-08	N/A
4.80E-08	2.10E-07	2.10E-07	N/A	9.00E-09	3.94E-08	3.94E-08	N/A	8.40E-09	3.68E-08	3.68E-08	N/A
4.80E-08	2.10E-07	2.10E-07	N/A	9.00E-09	3.94E-08	3.94E-08	N/A	8.40E-09	3.68E-08	3.68E-08	N/A
4.80E-08	2.10E-07	2.10E-07	N/A	9.00E-09	3.94E-08	3.94E-08	N/A	8.40E-09	3.68E-08	3.68E-08	N/A
4.80E-08	2.10E-07	2.10E-07	N/A	9.00E-09	3.94E-08	3.94E-08	N/A	8.40E-09	3.68E-08	3.68E-08	N/A
2.68E-08	1.17E-07	1.17E-07	N/A	5.03E-09	2.20E-08	2.20E-08	N/A	4.69E-09	2.05E-08	2.05E-08	N/A
2.68E-08	1.17E-07	1.17E-07	N/A	5.03E-09	2.20E-08	2.20E-08	N/A	4.69E-09	2.05E-08	2.05E-08	N/A
4.80E-08	2.10E-07	2.10E-07	N/A	9.00E-09	3.94E-08	3.94E-08	N/A	8.40E-09	3.68E-08	3.68E-08	N/A
			N/A	7.79E-05	1.95E-05	1.17E-05	N/A	2.47E-04	6.18E-05	3.71E-05	N/A

Potential		Actual		Potential		Actual		Potential		Actual	
Unrestricted	Limited	tpy		Unrestricted	Limited	tpy		Unrestricted	Limited	tpy	
1.6E-05	8.4E-06			1.0E-04	4.5E-05			5.2E-04	1.4E-04		

05300061 Abbott Northwestern Hospital				05300061 Abbott Northwestern Hospital				05300061 Abbott Northwestern Hospital			
3c) CAS 193-39-5				3c) CAS 91-57-6				3c) CAS 56-49-5			
3d Pollutant Indeno(1,2,3-cd)pyrene				3d Pollutant 2-Methylnaphthalene				3d Pollutant 3-Methylchloranthrene			
Potential		Actual		Potential		Actual		Potential		Actual	
lbs/hr	Unrestricted	Limited	tpy	lbs/hr	Unrestricted	Limited	tpy	lbs/hr	Unrestricted	Limited	tpy
4.43E-07	1.94E-06		N/A	6.82E-07	2.99E-06		N/A	5.12E-08	2.24E-07		N/A
4.43E-07	1.94E-06		N/A	6.82E-07	2.99E-06		N/A	5.12E-08	2.24E-07		N/A
4.43E-07	1.94E-06		N/A	6.82E-07	2.99E-06		N/A	5.12E-08	2.24E-07		N/A
1.18E-06	5.16E-06		N/A	1.81E-06	7.94E-06		N/A	1.36E-07	5.95E-07		N/A
		1.28E-06	N/A			6.30E-06	N/A			4.73E-07	N/A
1.89E-06	4.72E-07	2.83E-07	N/A				N/A				N/A
1.89E-06	2.83E-09	2.83E-07	N/A				N/A				N/A
2.12E-06	5.30E-07	3.18E-07	N/A				N/A				N/A
2.12E-06	9.29E-06	3.18E-07	N/A				N/A				N/A
2.83E-06	7.07E-07	4.24E-07	N/A				N/A				N/A
9.91E-07	2.48E-07	1.49E-07	N/A				N/A				N/A
1.37E-07	6.00E-07		N/A	2.06E-07	9.01E-07		N/A	1.54E-08	6.76E-08		N/A
1.37E-07	6.00E-07		N/A	2.06E-07	9.01E-07		N/A	1.54E-08	6.76E-08		N/A
1.37E-07	6.00E-07		N/A	2.06E-07	9.01E-07		N/A	1.54E-08	6.76E-08		N/A
		4.00E-07	N/A			3.60E-06	N/A			2.70E-07	N/A
2.58E-06	6.45E-07	3.87E-07	N/A				N/A				N/A
2.58E-06	6.45E-07	3.87E-07	N/A				N/A				N/A
2.58E-06	6.45E-07	3.87E-07	N/A				N/A				N/A
8.68E-07	2.17E-07	1.30E-07	N/A				N/A				N/A
7.20E-09	3.15E-08	3.15E-08	N/A	9.60E-08	4.20E-07	4.20E-07	N/A	7.20E-09	3.15E-08	3.15E-08	N/A
7.20E-09	3.15E-08	3.15E-08	N/A	9.60E-08	4.20E-07	4.20E-07	N/A	7.20E-09	3.15E-08	3.15E-08	N/A
5.40E-09	2.37E-08	2.37E-08	N/A	7.20E-08	3.15E-07	3.15E-07	N/A	5.40E-09	2.37E-08	2.37E-08	N/A
5.40E-09	2.37E-08	2.37E-08	N/A	7.20E-08	3.15E-07	3.15E-07	N/A	5.40E-09	2.37E-08	2.37E-08	N/A
5.40E-09	2.37E-08	2.37E-08	N/A	7.20E-08	3.15E-07	3.15E-07	N/A	5.40E-09	2.37E-08	2.37E-08	N/A
5.40E-09	2.37E-08	2.37E-08	N/A	7.20E-08	3.15E-07	3.15E-07	N/A	5.40E-09	2.37E-08	2.37E-08	N/A
3.02E-09	1.32E-08	1.32E-08	N/A	4.02E-08	1.76E-07	1.76E-07	N/A	3.02E-09	1.32E-08	1.32E-08	N/A
3.02E-09	1.32E-08	1.32E-08	N/A	4.02E-08	1.76E-07	1.76E-07	N/A	3.02E-09	1.32E-08	1.32E-08	N/A
5.40E-09	2.37E-08	2.37E-08	N/A	7.20E-08	3.15E-07	3.15E-07	N/A	5.40E-09	2.37E-08	2.37E-08	N/A
8.00E-06	2.00E-06	1.20E-06	N/A				N/A				N/A

Potential		Actual		Potential		Actual		Potential		Actual	
Unrestricted	Limited	tpy		Unrestricted	Limited	tpy		Unrestricted	Limited	tpy	
2.9E-05	6.2E-06			2.3E-05	1.3E-05					1.7E-06	9.5E-07

05300061 Abbott Northwestern Hospital				05300061 Abbott Northwestern Hospital				05300061 Abbott Northwestern Hospital			
3c) CAS		85-01-8		3c) CAS		129-00-0		3c) CAS		3268-87-9	
3d Pollutant		Phenanthrene		3d Pollutant		Pyrene		3d Pollutant		OCDD	
Potential		Actual		Potential		Actual		Potential		Actual	
lbs/hr	Unrestricted	Limited	tpy	lbs/hr	Unrestricted	Limited	tpy	lbs/hr	Unrestricted	Limited	tpy
2.18E-06	9.53E-06		N/A	1.42E-06	6.23E-06		N/A	6.42E-10	2.81E-09		N/A
2.18E-06	9.53E-06		N/A	1.42E-06	6.23E-06		N/A	6.42E-10	2.81E-09		N/A
2.18E-06	9.53E-06		N/A	1.42E-06	6.23E-06		N/A	6.42E-10	2.81E-09		N/A
5.78E-06	2.53E-05		N/A	3.77E-06	1.65E-05		N/A	1.71E-09	7.47E-09		N/A
		<b>8.43E-06</b>	<b>N/A</b>			<b>1.47E-05</b>	<b>N/A</b>			<b>1.17E-09</b>	<b>N/A</b>
1.86E-04	4.65E-05	2.79E-05	N/A	1.69E-05	4.23E-06	2.54E-06	N/A				N/A
1.86E-04	4.65E-05	2.79E-05	N/A	1.69E-05	2.54E-08	2.54E-06	N/A				N/A
2.09E-04	5.23E-05	3.14E-05	N/A	1.90E-05	4.75E-06	2.85E-06	N/A				N/A
2.09E-04	5.23E-05	3.14E-05	N/A	1.90E-05	4.75E-06	2.85E-06	N/A				N/A
2.79E-04	6.97E-05	4.18E-05	N/A	2.54E-05	6.34E-06	3.80E-06	N/A				N/A
9.76E-05	2.44E-05	1.46E-05	N/A	8.88E-06	2.22E-06	1.33E-06	N/A				N/A
6.72E-07	2.94E-06		N/A	4.29E-07	1.88E-06		N/A	1.98E-10	8.69E-10		N/A
6.72E-07	2.94E-06		N/A	4.29E-07	1.88E-06		N/A	1.98E-10	8.69E-10		N/A
6.72E-07	2.94E-06		N/A	4.29E-07	1.88E-06		N/A	1.98E-10	8.69E-10		N/A
6.72E-07	2.94E-06		N/A	4.29E-07	1.88E-06		N/A	1.98E-10	8.69E-10		N/A
		<b>3.12E-06</b>	<b>N/A</b>			<b>7.51E-06</b>	<b>N/A</b>			<b>2.12E-10</b>	<b>N/A</b>
2.54E-04	6.35E-05	3.81E-05	N/A	2.31E-05	5.78E-06	3.47E-06	N/A				N/A
2.54E-04	6.35E-05	3.81E-05	N/A	2.31E-05	5.78E-06	3.47E-06	N/A				N/A
2.54E-04	6.35E-05	3.81E-05	N/A	2.31E-05	5.78E-06	3.47E-06	N/A				N/A
8.55E-05	2.14E-05	1.28E-05	N/A	7.78E-06	1.94E-06	1.17E-06	N/A				N/A
6.80E-08	2.98E-07	2.98E-07	N/A	2.00E-07	8.76E-07	8.76E-07	N/A				N/A
6.80E-08	2.98E-07	2.98E-07	N/A	2.00E-07	8.76E-07	8.76E-07	N/A				N/A
5.10E-08	2.23E-07	2.23E-07	N/A	1.50E-07	6.57E-07	6.57E-07	N/A				N/A
5.10E-08	2.23E-07	2.23E-07	N/A	1.50E-07	6.57E-07	6.57E-07	N/A				N/A
5.10E-08	2.23E-07	2.23E-07	N/A	1.50E-07	6.57E-07	6.57E-07	N/A				N/A
5.10E-08	2.23E-07	2.23E-07	N/A	1.50E-07	6.57E-07	6.57E-07	N/A				N/A
2.85E-08	1.25E-07	1.25E-07	N/A	8.38E-08	3.67E-07	3.67E-07	N/A				N/A
2.85E-08	1.25E-07	1.25E-07	N/A	8.38E-08	3.67E-07	3.67E-07	N/A				N/A
5.10E-08	2.23E-07	2.23E-07	N/A	1.50E-07	6.57E-07	6.57E-07	N/A				N/A
7.88E-04	1.97E-04	1.18E-04	N/A	7.17E-05	1.79E-05	1.08E-05	N/A				N/A

Potential		Actual		Potential		Actual		Potential		Actual	
Unrestricted	Limited	tpy		Unrestricted	Limited	tpy		Unrestricted	Limited	tpy	
7.7E-04	4.3E-04			1.1E-04	6.6E-05			1.9E-08	1.4E-09		



05300061 Abbott Northwestern Hospital				05300061 Abbott Northwestern Hospital				05300061 Abbott Northwestern Hospital			
3c) CAS 7440-43-9				3c) CAS 7440-47-3				3c) CAS 7440-48-4			
3d Pollutant Cadmium				3d Pollutant Chromium				3d Pollutant Cobalt			
Potential		Actual		Potential		Actual		Potential		Actual	
lbs/hr	Unrestricted	Limited	tpy	lbs/hr	Unrestricted	Limited	tpy	lbs/hr	Unrestricted	Limited	tpy
8.70E-05	3.81E-04		N/A	8.70E-05	3.81E-04		N/A	2.39E-06	1.05E-05		N/A
8.70E-05	3.81E-04		N/A	8.70E-05	3.81E-04		N/A	2.39E-06	1.05E-05		N/A
8.70E-05	3.81E-04		N/A	8.70E-05	3.81E-04		N/A	2.39E-06	1.05E-05		N/A
2.31E-04	1.01E-03		N/A	2.31E-04	1.01E-03		N/A	6.34E-06	2.78E-05		N/A
		4.47E-04	N/A			5.26E-04	N/A			2.21E-05	N/A
			N/A				N/A				N/A
			N/A				N/A				N/A
			N/A				N/A				N/A
			N/A				N/A				N/A
			N/A				N/A				N/A
			N/A				N/A				N/A
			N/A				N/A				N/A
			N/A				N/A				N/A
2.69E-05	1.18E-04		N/A	2.69E-05	1.18E-04		N/A	7.20E-07	3.15E-06		N/A
2.69E-05	1.18E-04		N/A	2.69E-05	1.18E-04		N/A	7.20E-07	3.15E-06		N/A
2.69E-05	1.18E-04		N/A	2.69E-05	1.18E-04		N/A	7.20E-07	3.15E-06		N/A
2.69E-05	1.18E-04		N/A	2.69E-05	1.18E-04		N/A	7.20E-07	3.15E-06		N/A
		1.84E-04	N/A			2.26E-04	N/A			1.26E-05	N/A
			N/A				N/A				N/A
			N/A				N/A				N/A
			N/A				N/A				N/A
			N/A				N/A				N/A
			N/A				N/A				N/A
			N/A				N/A				N/A
4.40E-06	1.93E-05	1.93E-05	N/A	5.60E-06	2.45E-05	2.45E-05	N/A	3.36E-07	1.47E-06	1.47E-06	N/A
4.40E-06	1.93E-05	1.93E-05	N/A	5.60E-06	2.45E-05	2.45E-05	N/A	3.36E-07	1.47E-06	1.47E-06	N/A
3.30E-06	1.45E-05	1.45E-05	N/A	4.20E-06	1.84E-05	1.84E-05	N/A	2.52E-07	1.10E-06	1.10E-06	N/A
3.30E-06	1.45E-05	1.45E-05	N/A	4.20E-06	1.84E-05	1.84E-05	N/A	2.52E-07	1.10E-06	1.10E-06	N/A
3.30E-06	1.45E-05	1.45E-05	N/A	4.20E-06	1.84E-05	1.84E-05	N/A	2.52E-07	1.10E-06	1.10E-06	N/A
3.30E-06	1.45E-05	1.45E-05	N/A	4.20E-06	1.84E-05	1.84E-05	N/A	2.52E-07	1.10E-06	1.10E-06	N/A
1.84E-06	8.07E-06	8.07E-06	N/A	2.35E-06	1.03E-05	1.03E-05	N/A	1.41E-07	6.16E-07	6.16E-07	N/A
1.84E-06	8.07E-06	8.07E-06	N/A	2.35E-06	1.03E-05	1.03E-05	N/A	1.41E-07	6.16E-07	6.16E-07	N/A
3.30E-06	1.45E-05	1.45E-05	N/A	4.20E-06	1.84E-05	1.84E-05	N/A	2.52E-07	1.10E-06	1.10E-06	N/A
			N/A				N/A				N/A

Potential		Actual		Potential		Actual		Potential		Actual	
Unrestricted	Limited	tpy		Unrestricted	Limited	tpy		Unrestricted	Limited	tpy	
2.8E-03	7.6E-04			2.8E-03	9.1E-04			8.1E-05	4.4E-05		



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3c) CAS	7440-02-0	3c) CAS		7782-49-2
3d Pollutant	Nickel	3d Pollutant		Selenium
lbs/hr	Potential		Actual	
	Unrestricted	Limited	Unrestricted	Limited
tpy	tpy	tpy	tpy	tpy
8.70E-05	3.81E-04		N/A	4.35E-04
8.70E-05	3.81E-04		N/A	4.35E-04
8.70E-05	3.81E-04		N/A	4.35E-04
2.31E-04	1.01E-03		N/A	1.16E-03
		7.10E-04	N/A	5.06E-03
			N/A	7.99E-04
			N/A	
			N/A	
			N/A	
			N/A	
			N/A	
			N/A	
			N/A	
			N/A	
			N/A	
2.69E-05	1.18E-04		N/A	1.34E-04
2.69E-05	1.18E-04		N/A	1.34E-04
2.69E-05	1.18E-04		N/A	1.34E-04
2.69E-05	1.18E-04		N/A	1.34E-04
		3.25E-04	N/A	5.89E-04
			N/A	1.47E-04
			N/A	
			N/A	
			N/A	
			N/A	
			N/A	
8.40E-06	3.68E-05	3.68E-05	N/A	9.60E-08
8.40E-06	3.68E-05	3.68E-05	N/A	9.60E-08
6.30E-06	2.76E-05	2.76E-05	N/A	7.20E-08
6.30E-06	2.76E-05	2.76E-05	N/A	7.20E-08
6.30E-06	2.76E-05	2.76E-05	N/A	7.20E-08
6.30E-06	2.76E-05	2.76E-05	N/A	7.20E-08
3.52E-06	1.54E-05	1.54E-05	N/A	4.02E-08
3.52E-06	1.54E-05	1.54E-05	N/A	4.02E-08
6.30E-06	2.76E-05	2.76E-05	N/A	7.20E-08
			N/A	

Potential		Actual		Potential		Actual	
Unrestricted	Limited	Unrestricted	Limited	Unrestricted	Limited	Unrestricted	Limited
2.9E-03	1.3E-03			1.3E-02	9.5E-04		

Abbott Northwestern Hospital  
Permit No. 05300061-002  
Technical Support Document

## **Attachment 2**

### **Detailed Calculation Spreadsheets**



TABLE A1 : EMISSION SUMMARY (LIMITED POTENTIAL TO EMIT)

Criteria Pollutants								
Pollutant	CAS	GP001 Main Campus Boilers (tpy)	GP002 Main Campus Generators (tpy)	GP003 Heart Hospital Boilers (tpy)	GP004 Heart Hospital Generators (tpy)	GP005 10th Ave Boilers (tpy)	EU27 Generator (tpy)	FACILITY LIMITED PTE (tpy)
PM		3.241	0.39	1.30	0.29	0.88	0.03	6
PM10		2.863	0.34	1.23	0.26	0.88	0.03	6
PM2.5		2.580	0.33	1.18	0.25	0.88	0.03	5
SO <sub>2</sub>		0.238	0.01	0.10	0.00	0.07	0.00	0
NO <sub>x</sub>		33.800	14.16	15.47	10.36	11.54	6.32	92
VOC		1.654	0.48	0.83	0.36	0.63	0.14	4
CO		23.938	3.68	12.61	2.68	9.69	0.52	53
Greenhouse Gas (CO <sub>2</sub> e)		40,096	702	18,505	510	13,882	474	74,168
CO <sub>2</sub>		40,036	699	18,483	508	13,868	473	74,067
CH <sub>4</sub>		9.39E-01	2.84E-02	3.82E-01	2.06E-02	2.62E-01	1.92E-02	2
N <sub>2</sub> O		1.28E-01	5.67E-03	4.45E-02	4.12E-03	2.62E-02	3.83E-03	0
Organics								
Acetaldehyde	75-07-0	0.00E+00	7.72E-07	0.00E+00	5.61E-07	0.00E+00	5.22E-07	1.85E-06
Acrolein	107-02-8	0.00E+00	2.41E-07	0.00E+00	1.75E-07	0.00E+00	1.63E-07	5.80E-07
Benzene	71-43-2	6.32E-04	3.33E-03	3.15E-04	2.42E-03	2.42E-04	2.25E-03	9.19E-03
Butane	106-97-8	5.51E-01	0.00E+00	3.15E-01	0.00E+00	2.42E-01	0.00E+00	1.11E+00
Dichlorobenzene	25321-22-6	3.15E-04	0.00E+00	1.80E-04	0.00E+00	1.38E-04	0.00E+00	6.34E-04
Ethylbenzene	100-41-4	2.40E-05	0.00E+00	4.36E-06	0.00E+00	0.00E+00	0.00E+00	2.84E-05
Ethane	74-84-0	8.14E-01	0.00E+00	4.66E-01	0.00E+00	3.58E-01	0.00E+00	1.64E+00
Formaldehyde	50-00-0	3.21E-02	3.38E-04	1.28E-02	2.46E-04	8.66E-03	2.29E-04	5.44E-02
Hexane	110-54-3	4.73E-01	0.00E+00	2.70E-01	0.00E+00	2.08E-01	0.00E+00	9.51E-01
Naphthalene	91-20-3	5.87E-04	5.57E-04	1.63E-04	4.05E-04	7.04E-05	3.77E-04	2.16E-03
Pentane	109-66-0	6.83E-01	0.00E+00	3.90E-01	0.00E+00	3.00E-01	0.00E+00	1.37E+00
Propane	74-98-6	4.20E-01	0.00E+00	2.40E-01	0.00E+00	1.85E-01	0.00E+00	8.45E-01
Propylene	115-07-1	0.00E+00	1.20E-02	0.00E+00	8.70E-03	0.00E+00	8.09E-03	2.87E-02
1,1,1-Trichloroethane	71-55-6	8.91E-05	0.00E+00	1.62E-05	0.00E+00	0.00E+00	0.00E+00	1.05E-04
Toluene	108-88-3	3.23E-03	1.20E-03	9.04E-04	8.76E-04	3.92E-04	8.14E-04	7.42E-03
Xylene (o,m,p)	1332-20-7	4.11E-05	8.28E-04	7.47E-06	6.02E-04	0.00E+00	5.59E-04	2.04E-03
Acenaphthene	83-32-9	8.44E-06	2.01E-05	1.70E-06	1.46E-05	2.08E-07	1.36E-05	5.86E-05
Acenaphthylene	203-96-8	5.68E-07	3.96E-05	2.71E-07	2.88E-05	2.08E-07	2.67E-05	9.62E-05
Anthracene	120-12-7	1.09E-06	5.27E-06	4.22E-07	3.84E-06	2.77E-07	3.56E-06	1.45E-05
Benz(a)anthracene	56-55-3	1.99E-06	2.67E-06	5.28E-07	1.94E-06	2.08E-07	1.80E-06	9.13E-06
Benzo(a)pyrene	50-32-8	3.15E-07	1.10E-06	1.80E-07	8.01E-07	1.38E-07	7.45E-07	3.28E-06
Benzo(b)fluoranthene	205-99-2	4.73E-07	4.76E-06	2.70E-07	3.46E-06	2.08E-07	3.22E-06	1.24E-05
Benzo(b,k)fluoranthene	205-99-2	5.59E-07	0.00E+00	1.01E-07	0.00E+00	0.00E+00	0.00E+00	6.60E-07
Benzo(g,h,i)perylene	191-24-2	1.17E-06	2.38E-06	3.24E-07	1.73E-06	1.38E-07	1.61E-06	7.36E-06
Benzo(k)fluoranthene	205-82-3	4.73E-07	9.35E-07	2.70E-07	6.80E-07	2.08E-07	6.32E-07	3.20E-06
Chrysene	218-01-9	1.37E-06	6.56E-06	4.17E-07	4.77E-06	2.08E-07	4.43E-06	1.78E-05
Dibenzo(a,h)anthracene	53-70-3	9.45E-07	1.48E-06	2.84E-07	1.08E-06	1.38E-07	1.00E-06	4.93E-06
7,12-Dimethylbenz(a)anthracene	57-97-6	4.20E-06	0.00E+00	2.40E-06	0.00E+00	1.85E-06	0.00E+00	8.45E-06
Fluoranthene	206-44-0	2.61E-06	1.73E-05	7.55E-07	1.26E-05	3.46E-07	1.17E-05	4.52E-05
Fluorene	86-73-7	2.42E-06	5.49E-05	7.01E-07	3.99E-05	3.23E-07	3.71E-05	1.35E-04
Indeno(1,2,3-cd)pyrene	193-39-5	1.28E-06	1.78E-06	4.00E-07	1.29E-06	2.08E-07	1.20E-06	6.15E-06
2-Methylnaphthalene	91-57-6	6.30E-06	0.00E+00	3.60E-06	0.00E+00	2.77E-06	0.00E+00	1.27E-05
3-Methylchloranthrene	56-49-5	4.73E-07	0.00E+00	2.70E-07	0.00E+00	2.08E-07	0.00E+00	9.51E-07
Phenanthrene	85-01-8	8.43E-06	1.75E-04	3.12E-06	1.27E-04	1.96E-06	1.18E-04	4.34E-04
Pyrene	129-00-0	1.47E-05	1.59E-05	7.51E-06	1.16E-05	5.77E-06	1.08E-05	6.62E-05
OCDD	3268-87-9	1.17E-09	0.00E+00	2.12E-10	0.00E+00	0.00E+00	0.00E+00	1.38E-09
Polycyclic Organic Matter (POM)		5.78E-05	3.50E-04	2.29E-05	2.54E-04	1.54E-05	2.36E-04	9.36E-04
Metals								
Antimony	7440-36-0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Arsenic	7440-38-2	2.64E-04	0.00E+00	6.66E-05	0.00E+00	2.31E-05	0.00E+00	3.54E-04
Barium	7440-39-3	1.16E-03	0.00E+00	6.61E-04	0.00E+00	5.08E-04	0.00E+00	2.32E-03
Beryllium	7440-41-7	1.62E-04	0.00E+00	3.05E-05	0.00E+00	1.38E-06	0.00E+00	1.94E-04
Cadmium	7440-43-9	4.47E-04	0.00E+00	1.84E-04	0.00E+00	1.27E-04	0.00E+00	7.58E-04
Chloride		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Chromium	7440-47-3	5.26E-04	0.00E+00	2.26E-04	0.00E+00	1.62E-04	0.00E+00	9.14E-04
Chromium (VI)	18540-29-9	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cobalt	7440-48-4	2.21E-05	0.00E+00	1.26E-05	0.00E+00	9.69E-06	0.00E+00	4.44E-05
Copper	7440-50-8	5.40E-04	0.00E+00	1.77E-04	0.00E+00	9.81E-05	0.00E+00	8.16E-04
Fluoride	16984-48-8	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Lead	7139-92-1	6.07E-04	0.00E+00	1.57E-04	0.00E+00	5.77E-05	0.00E+00	8.21E-04
Manganese	7439-96-5	4.17E-04	0.00E+00	1.11E-04	0.00E+00	4.39E-05	0.00E+00	5.72E-04
Mercury	7439-97-6	2.27E-04	0.00E+00	6.54E-05	0.00E+00	3.00E-05	0.00E+00	3.22E-04
Molybdenum	7439-98-7	2.89E-04	0.00E+00	1.65E-04	0.00E+00	1.27E-04	0.00E+00	5.81E-04
Nickel	7440-02-0	7.10E-04	0.00E+00	3.25E-04	0.00E+00	2.42E-04	0.00E+00	1.28E-03
Phosphorus	7723-14-0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Selenium	7782-49-2	7.99E-04	0.00E+00	1.47E-04	0.00E+00	2.77E-06	0.00E+00	9.49E-04
Vanadium	7440-62-2	6.04E-04	0.00E+00	3.45E-04	0.00E+00	2.65E-04	0.00E+00	1.21E-03
Zinc	7440-66-6	7.82E-03	0.00E+00	4.35E-03	0.00E+00	3.35E-03	0.00E+00	1.55E-02
Max HAP		4.73E-01	5.97E-04	2.70E-01	7.25E-04	2.08E-01	2.25E-03	9.54E-01
Total HAP		5.14E-01	1.18E-03	2.84E-01	1.44E-03	2.18E-01	4.46E-03	1.02E+00

See Tables 2 through 31 for detailed calculations for each emission unit or group.

EU001 EMISSION CALCULATIONS (NATURAL GAS)							
Parameter	Value	Units	Source				
Emission Unit	EU001		MPCA Emission Unit ID				
Make	Bros		State operating permit application, November 1995				
Model	W2-37		State operating permit application, November 1995				
Maximum Heat Input	29	MMBtu/hr	State operating permit application, November 1995				
Fuel	Natural Gas						
Maximum Fuel Input	0.0284	MMSCF/hr	(Maximum Heat Input)/(Fuel Heat Value)				
Unlimited Annual Operation	8760	hr/yr	Number of hours in a year				
Unlimited Annual Fuel Input	249	MMSCF/yr	(Maximum Fuel Input) * (Unlimited Annual Operation)				
Annual Limit	525	MMSCF/yr	Permit limit for EU01-04				
Fuel Heat Value	1020	btu/scf	AP-42 Section 1.4				
Criteria Pollutants							
Pollutant	CAS	Emission Factor		Unlimited Emission Rate (lb/hr)	Unlimited Emission Rate (tpy)	Limited Emission Rate (tpy)	NOTES
PM		7.60	lb/MMSCF	0.216	0.95	0.95	A
PM10		7.60	lb/MMSCF	0.216	0.95	0.95	A
PM2.5		7.60	lb/MMSCF	0.216	0.95	0.95	A
SO <sub>2</sub>		0.60	lb/MMSCF	0.017	0.07	0.07	A
NOx		100.00	lb/MMSCF	2.843	12.45	12.45	B
VOC		5.50	lb/MMSCF	0.156	0.68	0.68	A
CO		84.00	lb/MMSCF	2.388	10.46	10.46	B
Greenhouse Gas (CO <sub>2</sub> e)				3,420	14,978	14,978	G
CO <sub>2</sub>		120161	lb/MMSCF	3,416	14,964	14,964	E
CH <sub>4</sub>		2.27E+00	lb/MMSCF	6.44E-02	2.82E-01	2.82E-01	F
N <sub>2</sub> O		2.27E-01	lb/MMSCF	6.44E-03	2.82E-02	2.82E-02	F
Organics							
Benzene	71-43-2	2.10E-03	lb/MMSCF	5.97E-05	2.62E-04	2.62E-04	C
Butane	106-97-8	2.10E+00	lb/MMSCF	5.97E-02	2.62E-01	2.62E-01	C
Dichlorobenzene	25321-22-6	1.20E-03	lb/MMSCF	3.41E-05	1.49E-04	1.49E-04	C
Ethane	74-84-0	3.10E+00	lb/MMSCF	8.81E-02	3.86E-01	3.86E-01	C
Formaldehyde	50-00-0	7.50E-02	lb/MMSCF	2.13E-03	9.34E-03	9.34E-03	C
Hexane	110-54-3	1.80E+00	lb/MMSCF	5.12E-02	2.24E-01	2.24E-01	C
Naphthalene	91-20-3	6.10E-04	lb/MMSCF	1.73E-05	7.60E-05	7.60E-05	C
Pentane	109-66-0	2.60E+00	lb/MMSCF	7.39E-02	3.24E-01	3.24E-01	C
Propane	74-98-6	1.60E+00	lb/MMSCF	4.55E-02	1.99E-01	1.99E-01	C
Toluene	108-88-3	3.40E-03	lb/MMSCF	9.67E-05	4.23E-04	4.23E-04	C
Acenaphthene	83-32-9	1.80E-06	lb/MMSCF	5.12E-08	2.24E-07	2.24E-07	C
Acenaphthylene	203-96-8	1.80E-06	lb/MMSCF	5.12E-08	2.24E-07	2.24E-07	C
Anthracene	120-12-7	2.40E-06	lb/MMSCF	6.82E-08	2.99E-07	2.99E-07	C
Benz(a)anthracene	56-55-3	1.80E-06	lb/MMSCF	5.12E-08	2.24E-07	2.24E-07	C
Benzo(a)pyrene	50-32-8	1.20E-06	lb/MMSCF	3.41E-08	1.49E-07	1.49E-07	C
Benzo(b)fluoranthene	205-99-2	1.80E-06	lb/MMSCF	5.12E-08	2.24E-07	2.24E-07	C
Benzo(g,h,i)perylene	191-24-2	1.20E-06	lb/MMSCF	3.41E-08	1.49E-07	1.49E-07	C
Benzo(k)fluoranthene	205-82-3	1.80E-06	lb/MMSCF	5.12E-08	2.24E-07	2.24E-07	C
Chrysene	218-01-9	1.80E-06	lb/MMSCF	5.12E-08	2.24E-07	2.24E-07	C
Dibenzo(a,h)anthracene	53-70-3	1.20E-06	lb/MMSCF	3.41E-08	1.49E-07	1.49E-07	C
7,12-Dimethylbenz(a)anthracene	57-97-6	1.60E-05	lb/MMSCF	4.55E-07	1.99E-06	1.99E-06	C
Fluoranthene	206-44-0	3.00E-06	lb/MMSCF	8.53E-08	3.74E-07	3.74E-07	C
Fluorene	86-73-7	2.80E-06	lb/MMSCF	7.96E-08	3.49E-07	3.49E-07	C
Indeno(1,2,3-cd)pyrene	193-39-5	1.80E-06	lb/MMSCF	5.12E-08	2.24E-07	2.24E-07	C
2-Methylnaphthalene	91-57-6	2.40E-05	lb/MMSCF	6.82E-07	2.99E-06	2.99E-06	C
3-Methylchloranthrene	56-49-5	1.80E-06	lb/MMSCF	5.12E-08	2.24E-07	2.24E-07	C
Phenanthrene	85-01-8	1.70E-05	lb/MMSCF	4.83E-07	2.12E-06	2.12E-06	C
Pyrene	129-00-0	5.00E-05	lb/MMSCF	1.42E-06	6.23E-06	6.23E-06	C
Polycyclic Organic Matter (POM)		1.33E-04	lb/MMSCF	3.79E-06	1.66E-05	1.66E-05	
Metals							
Arsenic	7440-38-2	2.00E-04	lb/MMSCF	5.69E-06	2.49E-05	2.49E-05	D
Barium	7440-39-3	4.40E-03	lb/MMSCF	1.25E-04	5.48E-04	5.48E-04	D
Beryllium	7440-41-7	1.20E-05	lb/MMSCF	3.41E-07	1.49E-06	1.49E-06	D
Cadmium	7440-43-9	1.10E-03	lb/MMSCF	3.13E-05	1.37E-04	1.37E-04	D
Chromium	7440-47-3	1.40E-03	lb/MMSCF	3.98E-05	1.74E-04	1.74E-04	D
Cobalt	7440-48-4	8.40E-05	lb/MMSCF	2.39E-06	1.05E-05	1.05E-05	D
Copper	7440-50-8	8.50E-04	lb/MMSCF	2.42E-05	1.06E-04	1.06E-04	D
Lead	7139-92-1	5.00E-04	lb/MMSCF	1.42E-05	6.23E-05	6.23E-05	D
Manganese	7439-96-5	3.80E-04	lb/MMSCF	1.08E-05	4.73E-05	4.73E-05	D
Mercury	7439-97-6	2.60E-04	lb/MMSCF	7.39E-06	3.24E-05	3.24E-05	D
Molybdenum	7439-98-7	1.10E-03	lb/MMSCF	3.13E-05	1.37E-04	1.37E-04	D
Nickel	7440-02-0	2.10E-03	lb/MMSCF	5.97E-05	2.62E-04	2.62E-04	D
Selenium	7782-49-2	2.40E-05	lb/MMSCF	6.82E-07	2.99E-06	2.99E-06	D
Vanadium	7440-62-2	2.30E-03	lb/MMSCF	6.54E-05	2.86E-04	2.86E-04	D
Zinc	7440-66-6	2.90E-02	lb/MMSCF	8.25E-04	3.61E-03	3.61E-03	D
Max HAP					2.24E-01	2.24E-01	
Total HAP					2.35E-01	2.35E-01	

## NOTES

- A AP-42 Table 1.4-2  
 B AP-42 Table 1.4-1  
 C AP-42 Table 1.4-3  
 D AP-42 Table 1.4-4  
 E 40 CFR Part 98 Table C-1: Pipeline natural gas = 1028 btu/scf, CO<sub>2</sub> emission = 53.02 kg CO<sub>2</sub>/mmBtu = 120162 lb/MMscf  
 F 40 CFR Part 98 Table C-2: Pipeline natural gas = 1028 btu/scf, CH<sub>4</sub> = 0.001 kg CH<sub>4</sub>/mmBtu, N<sub>2</sub>O = 0.0001 kg N<sub>2</sub>O / mmBtu  
 G CO<sub>2</sub>e = (Global Warming Potential, GWP) \* (Emission). GWP from 40 CFR Part 98 Table A-1. CO<sub>2</sub> = 1, CH<sub>4</sub> = 21, N<sub>2</sub>O = 310

TABLE A3 : EU01 EMISSION CALCULATIONS (FUEL OIL)							
Parameter	Value	Units	Source				
Emission Unit	EU001		MPCA Emission Unit ID				
Make	Bros		State operating permit application, November 1995				
Model	W2-37		State operating permit application, November 1995				
Maximum Heat Input	29	MMBtu/hr	State operating permit application, November 1995				
Fuel	No 2 Fuel Oil						
Maximum Fuel Input	207.1	gal/hr	(Maximum Heat Input)/(Fuel Heat Value)				
Unlimited Annual Operation	8760	hr/yr	Number of hours in a year				
Unlimited Annual Fuel Input	1,814,571	gal/yr	(Maximum Fuel Input) * (Unlimited Annual Operation)				
Annual Limit	755,000	gal/yr	Permit limit for EU01-04				
Fuel Heat Value	0.14	MMBtu/gal	AP-42 Section 1.4				
Criteria Pollutants							
Pollutant	CAS	Emission Factor		Unlimited Emission Rate (lb/hr)	Unlimited Emission Rate (tpy)	Limited Emission Rate (tpy)	NOTES
PM		3.30	lb/1000 gal	0.684	2.99	1.25	A
PM10		2.30	lb/1000 gal	0.476	2.09	0.87	B
PM2.5		1.55	lb/1000 gal	0.321	1.41	0.59	B
SO2		0.21	lb/1000 gal	0.044	0.19	0.08	A, C
NOx		20.00	lb/1000 gal	4.143	18.15	7.55	A
VOC		0.56	lb/1000 gal	0.115	0.50	0.21	A
CO		5.00	lb/1000 gal	1.036	4.54	1.89	A
Greenhouse Gas (CO <sub>2</sub> e)				4,677	20,484	8,523	J
CO <sub>2</sub>		22501	lb/1000 gal	4,661	20,415	8,494	H
CH <sub>4</sub>		9.13E-01	lb/1000 gal	0.19	8.28E-01	3.45E-01	I
N <sub>2</sub> O		1.83E-01	lb/1000 gal	0.04	1.66E-01	6.89E-02	I
Organics							
Benzene	71-43-2	2.14E-04	lb/1000 gal	4.43E-05	1.94E-04	8.08E-05	D
Ethylbenzene	100-41-4	6.36E-05	lb/1000 gal	1.32E-05	5.77E-05	2.40E-05	D
Formaldehyde	50-00-0	3.30E-02	lb/1000 gal	6.84E-03	2.99E-02	1.25E-02	D
Naphthalene	91-20-3	1.13E-03	lb/1000 gal	2.34E-04	1.03E-03	4.27E-04	D
1,1,1-Trichloroethane	71-55-6	2.36E-04	lb/1000 gal	4.89E-05	2.14E-04	8.91E-05	D
Toluene	108-88-3	6.20E-03	lb/1000 gal	1.28E-03	5.63E-03	2.34E-03	D
Xylene (o,m,p)	1332-20-7	1.09E-04	lb/1000 gal	2.26E-05	9.89E-05	4.11E-05	D
Acenaphthene	83-32-9	2.11E-05	lb/1000 gal	4.37E-06	1.91E-05	7.97E-06	D, F
Acenaphthylene	203-96-8	2.53E-07	lb/1000 gal	5.24E-08	2.30E-07	9.55E-08	D, F
Anthracene	120-12-7	1.22E-06	lb/1000 gal	2.53E-07	1.11E-06	4.61E-07	D, F
Benz(a)anthracene	56-55-3	4.01E-06	lb/1000 gal	8.31E-07	3.64E-06	1.51E-06	D, F
Benzo(b,k)fluoranthene	205-99-2	1.48E-06	lb/1000 gal	3.07E-07	1.34E-06	5.59E-07	D, F
Benzo(g,h,i)perylene	191-24-2	2.26E-06	lb/1000 gal	4.68E-07	2.05E-06	8.53E-07	D, F
Chrysene	218-01-9	2.38E-06	lb/1000 gal	4.93E-07	2.16E-06	8.98E-07	D, F
Dibenzo(a,h)anthracene	53-70-3	1.67E-06	lb/1000 gal	3.46E-07	1.52E-06	6.30E-07	D, F
Fluoranthene	206-44-0	4.84E-06	lb/1000 gal	1.00E-06	4.39E-06	1.83E-06	D, F
Fluorene	86-73-7	4.47E-06	lb/1000 gal	9.26E-07	4.06E-06	1.69E-06	D, F
Indeno(1,2,3-cd)pyrene	193-39-5	2.14E-06	lb/1000 gal	4.43E-07	1.94E-06	8.08E-07	D, F
Phenanthrene	85-01-8	1.05E-05	lb/1000 gal	2.18E-06	9.53E-06	3.96E-06	D, F
Pyrene	129-00-0	4.25E-06	lb/1000 gal	8.80E-07	3.86E-06	1.60E-06	D, F
OCDD	3268-87-9	3.10E-09	lb/1000 gal	6.42E-10	2.81E-09	1.17E-09	D, F
Polycyclic Organic Matter (POM)		6.06E-05	lb/1000 gal	1.25E-05	5.50E-05	2.29E-05	
Metals							
Arsenic	7440-38-2	5.60E-04	lb/1000 gal	1.16E-04	5.08E-04	2.11E-04	E
Beryllium	7440-41-7	4.20E-04	lb/1000 gal	8.70E-05	3.81E-04	1.59E-04	E
Cadmium	7440-43-9	4.20E-04	lb/1000 gal	8.70E-05	3.81E-04	1.59E-04	E
Chromium	7440-47-3	4.20E-04	lb/1000 gal	8.70E-05	3.81E-04	1.59E-04	E
Copper	7440-50-8	8.40E-04	lb/1000 gal	1.74E-04	7.62E-04	3.17E-04	E
Lead	7139-92-1	1.26E-03	lb/1000 gal	2.61E-04	1.14E-03	4.76E-04	E
Manganese	7439-96-5	8.40E-04	lb/1000 gal	1.74E-04	7.62E-04	3.17E-04	E
Mercury	7439-97-6	4.20E-04	lb/1000 gal	8.70E-05	3.81E-04	1.59E-04	E
Nickel	7440-02-0	4.20E-04	lb/1000 gal	8.70E-05	3.81E-04	1.59E-04	E
Selenium	7782-49-2	2.10E-03	lb/1000 gal	4.35E-04	1.91E-03	7.93E-04	E
Zinc	7440-66-6	5.60E-04	lb/1000 gal	1.16E-04	5.08E-04	2.11E-04	E
Max HAP					2.99E-02	1.25E-02	
Total HAP					4.34E-02	1.81E-02	

## NOTES

- A AP-42 Table 1.3-1, 9/98
- B AP-42 Table 1.3-6, 9/98
- C Sulfur Content= 0.0015 % wt
- D AP-42 Table 1.3-9, 9/98
- E AP-42 Table 1.3-10, 9/98
- F This compound is considered polycyclic organic matter (POM)
- G AP-42 Table 1.3-12, 9/98
- H 40 CFR Part 98 Table C-1: Fuel oil = 0.138 btu/gal, CO<sub>2</sub> emission = 73.96 kg CO<sub>2</sub>/mmBtu = 22,501 lb/1000 gal
- I 40 CFR Part 98 Table C-2: Fuel oil = 0.138 btu/gal, CH<sub>4</sub> = 0.003 kg CH<sub>4</sub>/mmBtu, N<sub>2</sub>O = 0.0006 kg N<sub>2</sub>O / mmBtu
- J CO<sub>2</sub>e = (Global Warming Potential, GWP) \* (Emission). GWP from 40 CFR Part 98 Table A-1. CO<sub>2</sub> = 1, CH<sub>4</sub> = 21, N<sub>2</sub>O = 310

EU002 EMISSION CALCULATIONS (NATURAL GAS)							
Parameter	Value	Units	Source				
Emission Unit	EU002		MPCA Emission Unit ID				
Make	Bros		State operating permit application, November 1995				
Model	W2-37		State operating permit application, November 1995				
Maximum Heat Input	29	MMBtu/hr	State operating permit application, November 1995				
Fuel	Natural Gas						
Maximum Fuel Input	0.0284	MMSCF/hr	(Maximum Heat Input)/(Fuel Heat Value)				
Unlimited Annual Operation	8760	hr/yr	Number of hours in a year				
Unlimited Annual Fuel Input	249	MMSCF/yr	(Maximum Fuel Input) * (Unlimited Annual Operation)				
Annual Limit	525	MMSCF/yr	Permit limit for EU01-04				
Fuel Heat Value	1020	btu/scf	AP-42 Section 1.4				
Criteria Pollutants							
Pollutant	CAS	Emission Factor		Unlimited Emission Rate (lb/hr)	Unlimited Emission Rate (tpy)	Limited Emission Rate (tpy)	NOTES
PM		7.60	lb/MMSCF	0.216	0.95	0.95	A
PM10		7.60	lb/MMSCF	0.216	0.95	0.95	A
PM2.5		7.60	lb/MMSCF	0.216	0.95	0.95	A
SO <sub>2</sub>		0.60	lb/MMSCF	0.017	0.07	0.07	A
NOx		100.00	lb/MMSCF	2.843	12.45	12.45	B
VOC		5.50	lb/MMSCF	0.156	0.68	0.68	A
CO		84.00	lb/MMSCF	2.388	10.46	10.46	B
Greenhouse Gas (CO <sub>2</sub> e)				3,420	14,978	14,978	G
CO <sub>2</sub>		120161	lb/MMSCF	3,416	14,964	14,964	E
CH <sub>4</sub>		2.27E+00	lb/MMSCF	6.44E-02	2.82E-01	2.82E-01	F
N <sub>2</sub> O		2.27E-01	lb/MMSCF	6.44E-03	2.82E-02	2.82E-02	F
Organics							
Benzene	71-43-2	2.10E-03	lb/MMSCF	5.97E-05	2.62E-04	2.62E-04	C
Butane	106-97-8	2.10E+00	lb/MMSCF	5.97E-02	2.62E-01	2.62E-01	C
Dichlorobenzene	25321-22-6	1.20E-03	lb/MMSCF	3.41E-05	1.49E-04	1.49E-04	C
Ethane	74-84-0	3.10E+00	lb/MMSCF	8.81E-02	3.86E-01	3.86E-01	C
Formaldehyde	50-00-0	7.50E-02	lb/MMSCF	2.13E-03	9.34E-03	9.34E-03	C
Hexane	110-54-3	1.80E+00	lb/MMSCF	5.12E-02	2.24E-01	2.24E-01	C
Naphthalene	91-20-3	6.10E-04	lb/MMSCF	1.73E-05	7.60E-05	7.60E-05	C
Pentane	109-66-0	2.60E+00	lb/MMSCF	7.39E-02	3.24E-01	3.24E-01	C
Propane	74-98-6	1.60E+00	lb/MMSCF	4.55E-02	1.99E-01	1.99E-01	C
Toluene	108-88-3	3.40E-03	lb/MMSCF	9.67E-05	4.23E-04	4.23E-04	C
Acenaphthene	83-32-9	1.80E-06	lb/MMSCF	5.12E-08	2.24E-07	2.24E-07	C
Acenaphthylene	203-96-8	1.80E-06	lb/MMSCF	5.12E-08	2.24E-07	2.24E-07	C
Anthracene	120-12-7	2.40E-06	lb/MMSCF	6.82E-08	2.99E-07	2.99E-07	C
Benzo(a)anthracene	56-55-3	1.80E-06	lb/MMSCF	5.12E-08	2.24E-07	2.24E-07	C
Benzo(a)pyrene	50-32-8	1.20E-06	lb/MMSCF	3.41E-08	1.49E-07	1.49E-07	C
Benzo(b)fluoranthene	205-99-2	1.80E-06	lb/MMSCF	5.12E-08	2.24E-07	2.24E-07	C
Benzo(g,h,i)perylene	191-24-2	1.20E-06	lb/MMSCF	3.41E-08	1.49E-07	1.49E-07	C
Benzo(k)fluoranthene	205-82-3	1.80E-06	lb/MMSCF	5.12E-08	2.24E-07	2.24E-07	C
Chrysene	218-01-9	1.80E-06	lb/MMSCF	5.12E-08	2.24E-07	2.24E-07	C
Dibenzo(a,h)anthracene	53-70-3	1.20E-06	lb/MMSCF	3.41E-08	1.49E-07	1.49E-07	C
7,12-Dimethylbenz(a)anthracene	57-97-6	1.60E-05	lb/MMSCF	4.55E-07	1.99E-06	1.99E-06	C
Fluoranthene	206-44-0	3.00E-06	lb/MMSCF	8.53E-08	3.74E-07	3.74E-07	C
Fluorene	86-73-7	2.80E-06	lb/MMSCF	7.96E-08	3.49E-07	3.49E-07	C
Indeno(1,2,3-cd)pyrene	193-39-5	1.80E-06	lb/MMSCF	5.12E-08	2.24E-07	2.24E-07	C
2-Methylnaphthalene	91-57-6	2.40E-05	lb/MMSCF	6.82E-07	2.99E-06	2.99E-06	C
3-Methylchloranthrene	56-49-5	1.80E-06	lb/MMSCF	5.12E-08	2.24E-07	2.24E-07	C
Phenanthrene	85-01-8	1.70E-05	lb/MMSCF	4.83E-07	2.12E-06	2.12E-06	C
Pyrene	129-00-0	5.00E-05	lb/MMSCF	1.42E-06	6.23E-06	6.23E-06	C
Polycyclic Organic Matter (POM)		1.33E-04	lb/MMSCF	3.79E-06	1.66E-05	1.66E-05	
Metals							
Arsenic	7440-38-2	2.00E-04	lb/MMSCF	5.69E-06	2.49E-05	2.49E-05	D
Barium	7440-39-3	4.40E-03	lb/MMSCF	1.25E-04	5.48E-04	5.48E-04	D
Beryllium	7440-41-7	1.20E-05	lb/MMSCF	3.41E-07	1.49E-06	1.49E-06	D
Cadmium	7440-43-9	1.10E-03	lb/MMSCF	3.13E-05	1.37E-04	1.37E-04	D
Chromium	7440-47-3	1.40E-03	lb/MMSCF	3.98E-05	1.74E-04	1.74E-04	D
Cobalt	7440-48-4	8.40E-05	lb/MMSCF	2.39E-06	1.05E-05	1.05E-05	D
Copper	7440-50-8	8.50E-04	lb/MMSCF	2.42E-05	1.06E-04	1.06E-04	D
Lead	7139-92-1	5.00E-04	lb/MMSCF	1.42E-05	6.23E-05	6.23E-05	D
Manganese	7439-96-5	3.80E-04	lb/MMSCF	1.08E-05	4.73E-05	4.73E-05	D
Mercury	7439-97-6	2.60E-04	lb/MMSCF	7.39E-06	3.24E-05	3.24E-05	D
Molybdenum	7439-98-7	1.10E-03	lb/MMSCF	3.13E-05	1.37E-04	1.37E-04	D
Nickel	7440-02-0	2.10E-03	lb/MMSCF	5.97E-05	2.62E-04	2.62E-04	D
Selenium	7782-49-2	2.40E-05	lb/MMSCF	6.82E-07	2.99E-06	2.99E-06	D
Vanadium	7440-62-2	2.30E-03	lb/MMSCF	6.54E-05	2.86E-04	2.86E-04	D
Zinc	7440-66-6	2.90E-02	lb/MMSCF	8.25E-04	3.61E-03	3.61E-03	D
Max HAP					2.24E-01	2.24E-01	
Total HAP					2.35E-01	2.35E-01	

## NOTES

- A AP-42 Table 1.4-2
- B AP-42 Table 1.4-1
- C AP-42 Table 1.4-3
- D AP-42 Table 1.4-4
- E 40 CFR Part 98 Table C-1: Pipeline natural gas = 1028 btu/scf, CO<sub>2</sub> emission = 53.02 kg CO<sub>2</sub>/mmBtu = 120162 lb/MMscf
- F 40 CFR Part 98 Table C-2: Pipeline natural gas = 1028 btu/scf, CH<sub>4</sub> = 0.001 kg CH<sub>4</sub>/mmBtu, N<sub>2</sub>O = 0.0001 kg N<sub>2</sub>O / mmBtu
- G CO<sub>2</sub>e = (Global Warming Potential, GWP) \* (Emission). GWP from 40 CFR Part 98 Table A-1. CO<sub>2</sub> = 1, CH<sub>4</sub> = 21, N<sub>2</sub>O = 310

EU002 EMISSION CALCULATIONS (FUEL OIL)							
Parameter	Value	Units	Source				
Emission Unit	EU002		MPCA Emission Unit ID				
Make	Bros		State operating permit application, November 1995				
Model	W2-37		State operating permit application, November 1995				
Maximum Heat Input	29	MMBtu/hr	State operating permit application, November 1995				
Fuel	No 2 Fuel Oil						
Maximum Fuel Input	207.1	gal/hr	(Maximum Heat Input)/(Fuel Heat Value)				
Unlimited Annual Operation	8760	hr/yr	Number of hours in a year				
Unlimited Annual Fuel Input	1,814,571	gal/yr	(Maximum Fuel Input) * (Unlimited Annual Operation)				
Annual Limit	755,000	gal/yr	Permit limit for EU01-04				
Fuel Heat Value	0.14	MMBtu/gal	AP-42 Section 1.4				
Criteria Pollutants							
Pollutant	CAS	Emission Factor		Unlimited Emission Rate (lb/hr)	Unlimited Emission Rate (tpy)	Limited Emission Rate (tpy)	NOTES
PM		3.30	lb/1000 gal	0.684	2.99	1.25	A
PM10		2.30	lb/1000 gal	0.476	2.09	0.87	B
PM2.5		1.55	lb/1000 gal	0.321	1.41	0.59	B
SO2		0.21	lb/1000 gal	0.044	0.19	0.08	A, C
NOx		20.00	lb/1000 gal	4.143	18.15	7.55	A
VOC		0.56	lb/1000 gal	0.115	0.50	0.21	A
CO		5.00	lb/1000 gal	1.036	4.54	1.89	A
Greenhouse Gas (CO <sub>2</sub> e)				4,677	20,484	8,523	J
CO <sub>2</sub>		22501	lb/1000 gal	4,661	20,415	8,494	H
CH <sub>4</sub>		9.13E-01	lb/1000 gal	0.19	8.28E-01	3.45E-01	I
N <sub>2</sub> O		1.83E-01	lb/1000 gal	0.04	1.66E-01	6.89E-02	I
Organics							
Benzene	71-43-2	2.14E-04	lb/1000 gal	4.43E-05	1.94E-04	8.08E-05	D
Ethylbenzene	100-41-4	6.36E-05	lb/1000 gal	1.32E-05	5.77E-05	2.40E-05	D
Formaldehyde	50-00-0	3.30E-02	lb/1000 gal	6.84E-03	2.99E-02	1.25E-02	D
Naphthalene	91-20-3	1.13E-03	lb/1000 gal	2.34E-04	1.03E-03	4.27E-04	D
1,1,1-Trichloroethane	71-55-6	2.36E-04	lb/1000 gal	4.89E-05	2.14E-04	8.91E-05	D
Toluene	108-88-3	6.20E-03	lb/1000 gal	1.28E-03	5.63E-03	2.34E-03	D
Xylene (o,m,p)	1332-20-7	1.09E-04	lb/1000 gal	2.26E-05	9.89E-05	4.11E-05	D
Acenaphthene	83-32-9	2.11E-05	lb/1000 gal	4.37E-06	1.91E-05	7.97E-06	D, F
Acenaphthylene	203-96-8	2.53E-07	lb/1000 gal	5.24E-08	2.30E-07	9.55E-08	D, F
Anthracene	120-12-7	1.22E-06	lb/1000 gal	2.53E-07	1.11E-06	4.61E-07	D, F
Benz(a)anthracene	56-55-3	4.01E-06	lb/1000 gal	8.31E-07	3.64E-06	1.51E-06	D, F
Benzo(b,k)fluoranthene	205-99-2	1.48E-06	lb/1000 gal	3.07E-07	1.34E-06	5.59E-07	D, F
Benzo(g,h,i)perylene	191-24-2	2.26E-06	lb/1000 gal	4.68E-07	2.05E-06	8.53E-07	D, F
Chrysene	218-01-9	2.38E-06	lb/1000 gal	4.93E-07	2.16E-06	8.98E-07	D, F
Dibenzo(a,h)anthracene	53-70-3	1.67E-06	lb/1000 gal	3.46E-07	1.52E-06	6.30E-07	D, F
Fluoranthene	206-44-0	4.84E-06	lb/1000 gal	1.00E-06	4.39E-06	1.83E-06	D, F
Fluorene	86-73-7	4.47E-06	lb/1000 gal	9.26E-07	4.06E-06	1.69E-06	D, F
Indeno(1,2,3-cd)pyrene	193-39-5	2.14E-06	lb/1000 gal	4.43E-07	1.94E-06	8.08E-07	D, F
Phenanthrene	85-01-8	1.05E-05	lb/1000 gal	2.18E-06	9.53E-06	3.96E-06	D, F
Pyrene	129-00-0	4.25E-06	lb/1000 gal	8.80E-07	3.86E-06	1.60E-06	D, F
OCDD	3268-87-9	3.10E-09	lb/1000 gal	6.42E-10	2.81E-09	1.17E-09	D, F
Polycyclic Organic Matter (POM)		6.06E-05	lb/1000 gal	1.25E-05	5.50E-05	2.29E-05	
Metals							
Arsenic	7440-38-2	5.60E-04	lb/1000 gal	1.16E-04	5.08E-04	2.11E-04	E
Beryllium	7440-41-7	4.20E-04	lb/1000 gal	8.70E-05	3.81E-04	1.59E-04	E
Cadmium	7440-43-9	4.20E-04	lb/1000 gal	8.70E-05	3.81E-04	1.59E-04	E
Chromium	7440-47-3	4.20E-04	lb/1000 gal	8.70E-05	3.81E-04	1.59E-04	E
Copper	7440-50-8	8.40E-04	lb/1000 gal	1.74E-04	7.62E-04	3.17E-04	E
Lead	7139-92-1	1.26E-03	lb/1000 gal	2.61E-04	1.14E-03	4.76E-04	E
Manganese	7439-96-5	8.40E-04	lb/1000 gal	1.74E-04	7.62E-04	3.17E-04	E
Mercury	7439-97-6	4.20E-04	lb/1000 gal	8.70E-05	3.81E-04	1.59E-04	E
Nickel	7440-02-0	4.20E-04	lb/1000 gal	8.70E-05	3.81E-04	1.59E-04	E
Selenium	7782-49-2	2.10E-03	lb/1000 gal	4.35E-04	1.91E-03	7.93E-04	E
Zinc	7440-66-6	5.60E-04	lb/1000 gal	1.16E-04	5.08E-04	2.11E-04	E
Max HAP					2.99E-02	1.25E-02	
Total HAP					4.34E-02	1.81E-02	

## NOTES

- A AP-42 Table 1.3-1, 9/98
- B AP-42 Table 1.3-6, 9/98
- C Sulfur Content= 0.0015 % wt
- D AP-42 Table 1.3-9, 9/98
- E AP-42 Table 1.3-10, 9/98
- F This compound is considered polycyclic organic matter (POM)
- G AP-42 Table 1.3-12, 9/98
- H 40 CFR Part 98 Table C-1: Pipeline natural gas = 0.138 btu/gal, CO<sub>2</sub> emission = 73.96 kg CO<sub>2</sub>/mmBtu = 22,501 lb/1000 gal
- I 40 CFR Part 98 Table C-2: Pipeline natural gas = 0.138 btu/gal, CH<sub>4</sub> = 0.003 kg CH<sub>4</sub>/mmBtu, N<sub>2</sub>O = 0.0006 kg N<sub>2</sub>O / mmBtu
- J CO<sub>2</sub>e = (Global Warming Potential, GWP) \* (Emission). GWP from 40 CFR Part 98 Table A-1. CO<sub>2</sub> = 1, CH<sub>4</sub> = 21, N<sub>2</sub>O = 310

EU003 EMISSION CALCULATIONS (NATURAL GAS)							
Parameter	Value	Units	Source				
Emission Unit	EU003		MPCA Emission Unit ID				
Make	Bros		State operating permit application, November 1995				
Model	W2-37		State operating permit application, November 1995				
Maximum Heat Input	29	MMBtu/hr	State operating permit application, November 1995				
Fuel	Natural Gas						
Maximum Fuel Input	0.0284	MMSCF/hr	(Maximum Heat Input)/(Fuel Heat Value)				
Unlimited Annual Operation	8760	hr/yr	Number of hours in a year				
Unlimited Annual Fuel Input	249	MMSCF/yr	(Maximum Fuel Input) * (Unlimited Annual Operation)				
Annual Limit	525	MMSCF/yr	Permit limit for EU01-04				
Fuel Heat Value	1020	btu/scf	AP-42 Section 1.4				
Criteria Pollutants							
Pollutant	CAS	Emission Factor		Unlimited Emission Rate (lb/hr)	Unlimited Emission Rate (tpy)	Limited Emission Rate (tpy)	NOTES
PM		7.60	lb/MMSCF	0.216	0.95	0.95	A
PM10		7.60	lb/MMSCF	0.216	0.95	0.95	A
PM2.5		7.60	lb/MMSCF	0.216	0.95	0.95	A
SO <sub>2</sub>		0.60	lb/MMSCF	0.017	0.07	0.07	A
NO <sub>x</sub>		100.00	lb/MMSCF	2.843	12.45	12.45	B
VOC		5.50	lb/MMSCF	0.156	0.68	0.68	A
CO		84.00	lb/MMSCF	2.388	10.46	10.46	B
Greenhouse Gas (CO <sub>2</sub> e)				3,420	14,978	14,978	G
CO <sub>2</sub>		120161	lb/MMSCF	3,416	14,964	14,964	E
CH <sub>4</sub>		2.27E+00	lb/MMSCF	6.44E-02	2.82E-01	2.82E-01	F
N <sub>2</sub> O		2.27E-01	lb/MMSCF	6.44E-03	2.82E-02	2.82E-02	F
Organics							
Benzene	71-43-2	2.10E-03	lb/MMSCF	5.97E-05	2.62E-04	2.62E-04	C
Butane	106-97-8	2.10E+00	lb/MMSCF	5.97E-02	2.62E-01	2.62E-01	C
Dichlorobenzene	25321-22-6	1.20E-03	lb/MMSCF	3.41E-05	1.49E-04	1.49E-04	C
Ethane	74-84-0	3.10E+00	lb/MMSCF	8.81E-02	3.86E-01	3.86E-01	C
Formaldehyde	50-00-0	7.50E-02	lb/MMSCF	2.13E-03	9.34E-03	9.34E-03	C
Hexane	110-54-3	1.80E+00	lb/MMSCF	5.12E-02	2.24E-01	2.24E-01	C
Naphthalene	91-20-3	6.10E-04	lb/MMSCF	1.73E-05	7.60E-05	7.60E-05	C
Pentane	109-66-0	2.60E+00	lb/MMSCF	7.39E-02	3.24E-01	3.24E-01	C
Propane	74-98-6	1.60E+00	lb/MMSCF	4.55E-02	1.99E-01	1.99E-01	C
Toluene	108-88-3	3.40E-03	lb/MMSCF	9.67E-05	4.23E-04	4.23E-04	C
Acenaphthene	83-32-9	1.80E-06	lb/MMSCF	5.12E-08	2.24E-07	2.24E-07	C
Acenaphthylene	203-96-8	1.80E-06	lb/MMSCF	5.12E-08	2.24E-07	2.24E-07	C
Anthracene	120-12-7	2.40E-06	lb/MMSCF	6.82E-08	2.99E-07	2.99E-07	C
Benzo(a)anthracene	56-55-3	1.80E-06	lb/MMSCF	5.12E-08	2.24E-07	2.24E-07	C
Benzo(a)pyrene	50-32-8	1.20E-06	lb/MMSCF	3.41E-08	1.49E-07	1.49E-07	C
Benzo(b)fluoranthene	205-99-2	1.80E-06	lb/MMSCF	5.12E-08	2.24E-07	2.24E-07	C
Benzo(g,h,i)perylene	191-24-2	1.20E-06	lb/MMSCF	3.41E-08	1.49E-07	1.49E-07	C
Benzo(k)fluoranthene	205-82-3	1.80E-06	lb/MMSCF	5.12E-08	2.24E-07	2.24E-07	C
Chrysene	218-01-9	1.80E-06	lb/MMSCF	5.12E-08	2.24E-07	2.24E-07	C
Dibenzo(a,h)anthracene	53-70-3	1.20E-06	lb/MMSCF	3.41E-08	1.49E-07	1.49E-07	C
7,12-Dimethylbenzo(a)anthracene	57-97-6	1.60E-05	lb/MMSCF	4.55E-07	1.99E-06	1.99E-06	C
Fluoranthene	206-44-0	3.00E-06	lb/MMSCF	8.53E-08	3.74E-07	3.74E-07	C
Fluorene	86-73-7	2.80E-06	lb/MMSCF	7.96E-08	3.49E-07	3.49E-07	C
Indeno(1,2,3-cd)pyrene	193-39-5	1.80E-06	lb/MMSCF	5.12E-08	2.24E-07	2.24E-07	C
2-Methylnaphthalene	91-57-6	2.40E-05	lb/MMSCF	6.82E-07	2.99E-06	2.99E-06	C
3-Methylchloranthrene	56-49-5	1.80E-06	lb/MMSCF	5.12E-08	2.24E-07	2.24E-07	C
Phenanthrene	85-01-8	1.70E-05	lb/MMSCF	4.83E-07	2.12E-06	2.12E-06	C
Pyrene	129-00-0	5.00E-05	lb/MMSCF	1.42E-06	6.23E-06	6.23E-06	C
Polycyclic Organic Matter (POM)		1.33E-04	lb/MMSCF	3.79E-06	1.66E-05	1.66E-05	
Metals							
Arsenic	7440-38-2	2.00E-04	lb/MMSCF	5.69E-06	2.49E-05	2.49E-05	D
Barium	7440-39-3	4.40E-03	lb/MMSCF	1.25E-04	5.48E-04	5.48E-04	D
Beryllium	7440-41-7	1.20E-05	lb/MMSCF	3.41E-07	1.49E-06	1.49E-06	D
Cadmium	7440-43-9	1.10E-03	lb/MMSCF	3.13E-05	1.37E-04	1.37E-04	D
Chromium	7440-47-3	1.40E-03	lb/MMSCF	3.98E-05	1.74E-04	1.74E-04	D
Cobalt	7440-48-4	8.40E-05	lb/MMSCF	2.39E-06	1.05E-05	1.05E-05	D
Copper	7440-50-8	8.50E-04	lb/MMSCF	2.42E-05	1.06E-04	1.06E-04	D
Lead	7139-92-1	5.00E-04	lb/MMSCF	1.42E-05	6.23E-05	6.23E-05	D
Manganese	7439-96-5	3.80E-04	lb/MMSCF	1.08E-05	4.73E-05	4.73E-05	D
Mercury	7439-97-6	2.60E-04	lb/MMSCF	7.39E-06	3.24E-05	3.24E-05	D
Molybdenum	7439-98-7	1.10E-03	lb/MMSCF	3.13E-05	1.37E-04	1.37E-04	D
Nickel	7440-02-0	2.10E-03	lb/MMSCF	5.97E-05	2.62E-04	2.62E-04	D
Selenium	7782-49-2	2.40E-05	lb/MMSCF	6.82E-07	2.99E-06	2.99E-06	D
Vanadium	7440-62-2	2.30E-03	lb/MMSCF	6.54E-05	2.86E-04	2.86E-04	D
Zinc	7440-66-6	2.90E-02	lb/MMSCF	8.25E-04	3.61E-03	3.61E-03	D
Max HAP					2.24E-01	2.24E-01	
Total HAP					2.35E-01	2.35E-01	

## NOTES

- A AP-42 Table 1.4-2
- B AP-42 Table 1.4-1
- C AP-42 Table 1.4-3
- D AP-42 Table 1.4-4
- E 40 CFR Part 98 Table C-1: Pipeline natural gas = 1028 btu/scf, CO<sub>2</sub> emission = 53.02 kg CO<sub>2</sub>/mmBtu = 120162 lb/MMscf
- F 40 CFR Part 98 Table C-2: Pipeline natural gas = 1028 btu/scf, CH<sub>4</sub> = 0.001 kg CH<sub>4</sub>/mmBtu, N<sub>2</sub>O = 0.0001 kg N<sub>2</sub>O / mmBtu
- G CO<sub>2</sub>e = (Global Warming Potential, GWP) \* (Emission). GWP from 40 CFR Part 98 Table A-1. CO<sub>2</sub> = 1, CH<sub>4</sub> = 21, N<sub>2</sub>O = 310

EU003 EMISSION CALCULATIONS (FUEL OIL)							
Parameter	Value	Units	Source				
Emission Unit	EU003		MPCA Emission Unit ID				
Make	Bros		State operating permit application, November 1995				
Model	W2-37		State operating permit application, November 1995				
Maximum Heat Input	29	MMBtu/hr	State operating permit application, November 1995				
Fuel	No 2 Fuel Oil						
Maximum Fuel Input	207.1	gal/hr	(Maximum Heat Input)/(Fuel Heat Value)				
Unlimited Annual Operation	8760	hr/yr	Number of hours in a year				
Unlimited Annual Fuel Input	1,814,571	gal/yr	(Maximum Fuel Input) * (Unlimited Annual Operation)				
Annual Limit	755,000	gal/yr	Permit limit for EU01-04				
Fuel Heat Value	0.14	MMBtu/gal	AP-42 Section 1.4				
Criteria Pollutants							
Pollutant	CAS	Emission Factor		Unlimited Emission Rate (lb/hr)	Unlimited Emission Rate (tpy)	Limited Emission Rate (tpy)	NOTES
PM		3.30	lb/1000 gal	0.684	2.99	1.25	A
PM10		2.30	lb/1000 gal	0.476	2.09	0.87	B
PM2.5		1.55	lb/1000 gal	0.321	1.41	0.59	B
SO2		0.21	lb/1000 gal	0.044	0.19	0.08	A, C
NOx		20.00	lb/1000 gal	4.143	18.15	7.55	A
VOC		0.56	lb/1000 gal	0.115	0.50	0.21	A
CO		5.00	lb/1000 gal	1.036	4.54	1.89	A
Greenhouse Gas (CO <sub>2</sub> e)				4,677	20,484	8,523	J
CO <sub>2</sub>		22501	lb/1000 gal	4,661	20,415	8,494	H
CH <sub>4</sub>		9.13E-01	lb/1000 gal	0.19	8.28E-01	3.45E-01	I
N <sub>2</sub> O		1.83E-01	lb/1000 gal	0.04	1.66E-01	6.89E-02	I
Organics							
Benzene	71-43-2	2.14E-04	lb/1000 gal	4.43E-05	1.94E-04	8.08E-05	D
Ethylbenzene	100-41-4	6.36E-05	lb/1000 gal	1.32E-05	5.77E-05	2.40E-05	D
Formaldehyde	50-00-0	3.30E-02	lb/1000 gal	6.84E-03	2.99E-02	1.25E-02	D
Naphthalene	91-20-3	1.13E-03	lb/1000 gal	2.34E-04	1.03E-03	4.27E-04	D
1,1,1-Trichloroethane	71-55-6	2.36E-04	lb/1000 gal	4.89E-05	2.14E-04	8.91E-05	D
Toluene	108-88-3	6.20E-03	lb/1000 gal	1.28E-03	5.63E-03	2.34E-03	D
Xylene (o,m,p)	1332-20-7	1.09E-04	lb/1000 gal	2.26E-05	9.89E-05	4.11E-05	D
Acenaphthene	83-32-9	2.11E-05	lb/1000 gal	4.37E-06	1.91E-05	7.97E-06	D, F
Acenaphthylene	203-96-8	2.53E-07	lb/1000 gal	5.24E-08	2.30E-07	9.55E-08	D, F
Anthracene	120-12-7	1.22E-06	lb/1000 gal	2.53E-07	1.11E-06	4.61E-07	D, F
Benzo(a)anthracene	56-55-3	4.01E-06	lb/1000 gal	8.31E-07	3.64E-06	1.51E-06	D, F
Benzo(b,k)fluoranthene	205-99-2	1.48E-06	lb/1000 gal	3.07E-07	1.34E-06	5.59E-07	D, F
Benzo(g,h,i)perylene	191-24-2	2.26E-06	lb/1000 gal	4.68E-07	2.05E-06	8.53E-07	D, F
Chrysene	218-01-9	2.38E-06	lb/1000 gal	4.93E-07	2.16E-06	8.98E-07	D, F
Dibenzo(a,h)anthracene	53-70-3	1.67E-06	lb/1000 gal	3.46E-07	1.52E-06	6.30E-07	D, F
Fluoranthene	206-44-0	4.84E-06	lb/1000 gal	1.00E-06	4.39E-06	1.83E-06	D, F
Fluorene	86-73-7	4.47E-06	lb/1000 gal	9.26E-07	4.06E-06	1.69E-06	D, F
Indeno(1,2,3-cd)pyrene	193-39-5	2.14E-06	lb/1000 gal	4.43E-07	1.94E-06	8.08E-07	D, F
Phenanthrene	85-01-8	1.05E-05	lb/1000 gal	2.18E-06	9.53E-06	3.96E-06	D, F
Pyrene	129-00-0	4.25E-06	lb/1000 gal	8.80E-07	3.86E-06	1.60E-06	D, F
OCDD	3268-87-9	3.10E-09	lb/1000 gal	6.42E-10	2.81E-09	1.17E-09	D, F
Polycyclic Organic Matter (POM)		6.06E-05	lb/1000 gal	1.25E-05	5.50E-05	2.29E-05	
Metals							
Arsenic	7440-38-2	5.60E-04	lb/1000 gal	1.16E-04	5.08E-04	2.11E-04	E
Beryllium	7440-41-7	4.20E-04	lb/1000 gal	8.70E-05	3.81E-04	1.59E-04	E
Cadmium	7440-43-9	4.20E-04	lb/1000 gal	8.70E-05	3.81E-04	1.59E-04	E
Chromium	7440-47-3	4.20E-04	lb/1000 gal	8.70E-05	3.81E-04	1.59E-04	E
Copper	7440-50-8	8.40E-04	lb/1000 gal	1.74E-04	7.62E-04	3.17E-04	E
Lead	7139-92-1	1.26E-03	lb/1000 gal	2.61E-04	1.14E-03	4.76E-04	E
Manganese	7439-96-5	8.40E-04	lb/1000 gal	1.74E-04	7.62E-04	3.17E-04	E
Mercury	7439-97-6	4.20E-04	lb/1000 gal	8.70E-05	3.81E-04	1.59E-04	E
Nickel	7440-02-0	4.20E-04	lb/1000 gal	8.70E-05	3.81E-04	1.59E-04	E
Selenium	7782-49-2	2.10E-03	lb/1000 gal	4.35E-04	1.91E-03	7.93E-04	E
Zinc	7440-66-6	5.60E-04	lb/1000 gal	1.16E-04	5.08E-04	2.11E-04	E
Max HAP					2.99E-02	1.25E-02	
Total HAP					4.34E-02	1.81E-02	

## NOTES

- A AP-42 Table 1.3-1, 9/98
- B AP-42 Table 1.3-6, 9/98
- C Sulfur Content= 0.0015 % wt
- D AP-42 Table 1.3-9, 9/98
- E AP-42 Table 1.3-10, 9/98
- F This compound is considered polycyclic organic matter (POM)
- G AP-42 Table 1.3-12, 9/98
- H 40 CFR Part 98 Table C-1: Pipeline natural gas = 0.138 btu/gal, CO<sub>2</sub> emission = 73.96 kg CO<sub>2</sub>/mmBtu = 22.501 lb/1000 gal
- I 40 CFR Part 98 Table C-2: Pipeline natural gas = 0.138 btu/gal, CH<sub>4</sub> = 0.003 kg CH<sub>4</sub>/mmBtu, N<sub>2</sub>O = 0.0006 kg N<sub>2</sub>O / mmBtu
- J CO<sub>2</sub>e = (Global Warming Potential, GWP) \* (Emission). GWP from 40 CFR Part 98 Table A-1. CO<sub>2</sub> = 1, CH<sub>4</sub> = 21, N<sub>2</sub>O = 310



EU004 EMISSION CALCULATIONS (NATURAL GAS)							
Parameter	Value	Units	Source				
Emission Unit	EU004		MPCA Emission Unit ID				
Make	Cleaver Brooks		State operating permit application, November 1995				
Model	WT 439X-CN6		State operating permit application, November 1995				
Maximum Heat Input	77	MMBtu/hr	State operating permit application, November 1995				
Fuel	Natural Gas						
Maximum Fuel Input	0.0755	MMSCF/hr	(Maximum Heat Input)/(Fuel Heat Value)				
Unlimited Annual Operation	8760	hr/yr	Number of hours in a year				
Unlimited Annual Fuel Input	661	MMSCF/yr	(Maximum Fuel Input) * (Unlimited Annual Operation)				
Annual Limit	525	MMSCF/yr	Permit limit for EU01-04				
Fuel Heat Value	1020	btu/scf	AP-42 Section 1.4				
Criteria Pollutants							
Pollutant	CAS	Emission Factor		Unlimited Emission Rate (lb/hr)	Unlimited Emission Rate (tpy)	Limited Emission Rate (tpy)	NOTES
PM		7.60	lb/MMSCF	0.574	2.51	2.00	A
PM10		7.60	lb/MMSCF	0.574	2.51	2.00	A
PM2.5		7.60	lb/MMSCF	0.574	2.51	2.00	A
SO <sub>2</sub>		0.60	lb/MMSCF	0.045	0.20	0.16	A
NOx		100.00	lb/MMSCF	7.549	33.06	26.25	B
VOC		5.50	lb/MMSCF	0.415	1.82	1.44	A
CO		84.00	lb/MMSCF	6.341	27.77	22.05	B
Greenhouse Gas (CO <sub>2</sub> e)				9,080	39,770	31,573	G
CO <sub>2</sub>		120161	lb/MMSCF	9,071	39,731	31,542	E
CH <sub>4</sub>		2.27E+00	lb/MMSCF	1.71E-01	7.49E-01	5.95E-01	F
N <sub>2</sub> O		2.27E-01	lb/MMSCF	1.71E-02	7.49E-02	5.95E-02	F
Organics							
Benzene	71-43-2	2.10E-03	lb/MMSCF	1.59E-04	6.94E-04	5.51E-04	C
Butane	106-97-8	2.10E+00	lb/MMSCF	1.59E-01	6.94E-01	5.51E-01	C
Dichlorobenzene	25321-22-6	1.20E-03	lb/MMSCF	9.06E-05	3.97E-04	3.15E-04	C
Ethane	74-84-0	3.10E+00	lb/MMSCF	2.34E-01	1.03E+00	8.14E-01	C
Formaldehyde	50-00-0	7.50E-02	lb/MMSCF	5.66E-03	2.48E-02	1.97E-02	C
Hexane	110-54-3	1.80E+00	lb/MMSCF	1.36E-01	5.95E-01	4.73E-01	C
Naphthalene	91-20-3	6.10E-04	lb/MMSCF	4.60E-05	2.02E-04	1.60E-04	C
Pentane	109-66-0	2.60E+00	lb/MMSCF	1.96E-01	8.60E-01	6.83E-01	C
Propane	74-98-6	1.60E+00	lb/MMSCF	1.21E-01	5.29E-01	4.20E-01	C
Toluene	108-88-3	3.40E-03	lb/MMSCF	2.57E-04	1.12E-03	8.93E-04	C
Acenaphthene	83-32-9	1.80E-06	lb/MMSCF	1.36E-07	5.95E-07	4.73E-07	C
Acenaphthylene	203-96-8	1.80E-06	lb/MMSCF	1.36E-07	5.95E-07	4.73E-07	C
Anthracene	120-12-7	2.40E-06	lb/MMSCF	1.81E-07	7.94E-07	6.30E-07	C
Benzo(a)anthracene	56-55-3	1.80E-06	lb/MMSCF	1.36E-07	5.95E-07	4.73E-07	C
Benzo(a)pyrene	50-32-8	1.20E-06	lb/MMSCF	9.06E-08	3.97E-07	3.15E-07	C
Benzo(b)fluoranthene	205-99-2	1.80E-06	lb/MMSCF	1.36E-07	5.95E-07	4.73E-07	C
Benzo(g,h,i)perylene	191-24-2	1.20E-06	lb/MMSCF	9.06E-08	3.97E-07	3.15E-07	C
Benzo(k)fluoranthene	205-82-3	1.80E-06	lb/MMSCF	1.36E-07	5.95E-07	4.73E-07	C
Chrysene	218-01-9	1.80E-06	lb/MMSCF	1.36E-07	5.95E-07	4.73E-07	C
Dibenzo(a,h)anthracene	53-70-3	1.20E-06	lb/MMSCF	9.06E-08	3.97E-07	3.15E-07	C
7,12-Dimethylbenzo(a)anthracene	57-97-6	1.60E-05	lb/MMSCF	1.21E-06	5.29E-06	4.20E-06	C
Fluoranthene	206-44-0	3.00E-06	lb/MMSCF	2.26E-07	9.92E-07	7.88E-07	C
Fluorene	86-73-7	2.80E-06	lb/MMSCF	2.11E-07	9.26E-07	7.35E-07	C
Indeno(1,2,3-cd)pyrene	193-39-5	1.80E-06	lb/MMSCF	1.36E-07	5.95E-07	4.73E-07	C
2-Methylnaphthalene	91-57-6	2.40E-05	lb/MMSCF	1.81E-06	7.94E-06	6.30E-06	C
3-Methylchloranthrene	56-49-5	1.80E-06	lb/MMSCF	1.36E-07	5.95E-07	4.73E-07	C
Phenanthrene	85-01-8	1.70E-05	lb/MMSCF	1.28E-06	5.62E-06	4.46E-06	C
Pyrene	129-00-0	5.00E-05	lb/MMSCF	3.77E-06	1.65E-05	1.31E-05	C
Polycyclic Organic Matter (POM)		1.33E-04	lb/MMSCF	1.01E-05	4.40E-05	3.50E-05	
Metals							
Arsenic	7440-38-2	2.00E-04	lb/MMSCF	1.51E-05	6.61E-05	5.25E-05	D
Barium	7440-39-3	4.40E-03	lb/MMSCF	3.32E-04	1.45E-03	1.16E-03	D
Beryllium	7440-41-7	1.20E-05	lb/MMSCF	9.06E-07	3.97E-06	3.15E-06	D
Cadmium	7440-43-9	1.10E-03	lb/MMSCF	8.30E-05	3.64E-04	2.89E-04	D
Chromium	7440-47-3	1.40E-03	lb/MMSCF	1.06E-04	4.63E-04	3.68E-04	D
Cobalt	7440-48-4	8.40E-05	lb/MMSCF	6.34E-06	2.78E-05	2.21E-05	D
Copper	7440-50-8	8.50E-04	lb/MMSCF	6.42E-05	2.81E-04	2.23E-04	D
Lead	7139-92-1	5.00E-04	lb/MMSCF	3.77E-05	1.65E-04	1.31E-04	D
Manganese	7439-96-5	3.80E-04	lb/MMSCF	2.87E-05	1.26E-04	9.98E-05	D
Mercury	7439-97-6	2.60E-04	lb/MMSCF	1.96E-05	8.60E-05	6.83E-05	D
Molybdenum	7439-98-7	1.10E-03	lb/MMSCF	8.30E-05	3.64E-04	2.89E-04	D
Nickel	7440-02-0	2.10E-03	lb/MMSCF	1.59E-04	6.94E-04	5.51E-04	D
Selenium	7782-49-2	2.40E-05	lb/MMSCF	1.81E-06	7.94E-06	6.30E-06	D
Vanadium	7440-62-2	2.30E-03	lb/MMSCF	1.74E-04	7.60E-04	6.04E-04	D
Zinc	7440-66-6	2.90E-02	lb/MMSCF	2.19E-03	9.59E-03	7.61E-03	D
Max HAP					5.95E-01	4.73E-01	
Total HAP					6.24E-01	4.96E-01	

## NOTES

- A AP-42 Table 1.4-2  
 B AP-42 Table 1.4-1  
 C AP-42 Table 1.4-3  
 D AP-42 Table 1.4-4  
 E 40 CFR Part 98 Table C-1: Pipeline natural gas = 1028 btu/scf, CO<sub>2</sub> emission = 53.02 kg CO<sub>2</sub>/mmBtu = 120162 lb/MMscf  
 F 40 CFR Part 98 Table C-2: Pipeline natural gas = 1028 btu/scf, CH<sub>4</sub> = 0.001 kg CH<sub>4</sub>/mmBtu, N<sub>2</sub>O = 0.0001 kg N<sub>2</sub>O / mmBtu  
 G CO<sub>2</sub>e = (Global Warming Potential, GWP) \* (Emission). GWP from 40 CFR Part 98 Table A-1. CO<sub>2</sub> = 1, CH<sub>4</sub> = 21, N<sub>2</sub>O = 310



EU004 EMISSION CALCULATIONS (FUEL OIL)							
Parameter	Value	Units	Source				
Emission Unit	EU004		MPCA Emission Unit ID				
Make	Cleaver Brooks		State operating permit application, November 1995				
Model	WT 439X-CN6		State operating permit application, November 1995				
Maximum Heat Input	77	MMBtu/hr	State operating permit application, November 1995				
Fuel	No 2 Fuel Oil						
Maximum Fuel Input	550.0	gal/hr	(Maximum Heat Input)/(Fuel Heat Value)				
Unlimited Annual Operation	8760	hr/yr	Number of hours in a year				
Unlimited Annual Fuel Input	4,818,000	gal/yr	(Maximum Fuel Input) * (Unlimited Annual Operation)				
Annual Limit	755,000	gal/yr	Permit limit for EU01-04				
Fuel Heat Value	0.14	MMBtu/gal	AP-42 Section 1.4				
Criteria Pollutants							
Pollutant	CAS	Emission Factor		Unlimited Emission Rate (lb/hr)	Unlimited Emission Rate (tpy)	Limited Emission Rate (tpy)	NOTES
PM		3.30	lb/1000 gal	1.815	7.95	1.25	A
PM10		2.30	lb/1000 gal	1.265	5.54	0.87	B
PM2.5		1.55	lb/1000 gal	0.853	3.73	0.59	B
SO2		0.21	lb/1000 gal	0.117	0.51	0.08	A, C
NOx		20.00	lb/1000 gal	11.000	48.18	7.55	A
VOC		0.56	lb/1000 gal	0.306	1.34	0.21	A
CO		5.00	lb/1000 gal	2.750	12.05	1.89	A
Greenhouse Gas (CO <sub>2</sub> e)				12,417	54,388	8,523	J
CO <sub>2</sub>		22501	lb/1000 gal	12,376	54,205	8,494	H
CH <sub>4</sub>		9.13E-01	lb/1000 gal	0.50	2.20E+00	3.45E-01	I
N <sub>2</sub> O		1.83E-01	lb/1000 gal	0.10	4.40E-01	6.89E-02	I
Organics							
Benzene	71-43-2	2.14E-04	lb/1000 gal	1.18E-04	5.16E-04	8.08E-05	D
Ethylbenzene	100-41-4	6.36E-05	lb/1000 gal	3.50E-05	1.53E-04	2.40E-05	D
Formaldehyde	50-00-0	3.30E-02	lb/1000 gal	1.82E-02	7.95E-02	1.25E-02	D
Naphthalene	91-20-3	1.13E-03	lb/1000 gal	6.22E-04	2.72E-03	4.27E-04	D
1,1,1-Trichloroethane	71-55-6	2.36E-04	lb/1000 gal	1.30E-04	5.69E-04	8.91E-05	D
Toluene	108-88-3	6.20E-03	lb/1000 gal	3.41E-03	1.49E-02	2.34E-03	D
Xylene (o,m,p)	1332-20-7	1.09E-04	lb/1000 gal	6.00E-05	2.63E-04	4.11E-05	D
Acenaphthene	83-32-9	2.11E-05	lb/1000 gal	1.16E-05	5.08E-05	7.97E-06	D, F
Acenaphthylene	203-96-8	2.53E-07	lb/1000 gal	1.39E-07	6.09E-07	9.55E-08	D, F
Anthracene	120-12-7	1.22E-06	lb/1000 gal	6.71E-07	2.94E-06	4.61E-07	D, F
Benz(a)anthracene	56-55-3	4.01E-06	lb/1000 gal	2.21E-06	9.66E-06	1.51E-06	D, F
Benzo(b,k)fluoranthene	205-99-2	1.48E-06	lb/1000 gal	8.14E-07	3.57E-06	5.59E-07	D, F
Benzo(g,h,i)perylene	191-24-2	2.26E-06	lb/1000 gal	1.24E-06	5.44E-06	8.53E-07	D, F
Chrysene	218-01-9	2.38E-06	lb/1000 gal	1.31E-06	5.73E-06	8.98E-07	D, F
Dibenzo(a,h)anthracene	53-70-3	1.67E-06	lb/1000 gal	9.19E-07	4.02E-06	6.30E-07	D, F
Fluoranthene	206-44-0	4.84E-06	lb/1000 gal	2.66E-06	1.17E-05	1.83E-06	D, F
Fluorene	86-73-7	4.47E-06	lb/1000 gal	2.46E-06	1.08E-05	1.69E-06	D, F
Indeno(1,2,3-cd)pyrene	193-39-5	2.14E-06	lb/1000 gal	1.18E-06	5.16E-06	8.08E-07	D, F
Phenanthrene	85-01-8	1.05E-05	lb/1000 gal	5.78E-06	2.53E-05	3.96E-06	D, F
Pyrene	129-00-0	4.25E-06	lb/1000 gal	2.34E-06	1.02E-05	1.60E-06	D, F
OCDD	3268-87-9	3.10E-09	lb/1000 gal	1.71E-09	7.47E-09	1.17E-09	D, F
Polycyclic Organic Matter (POM)		6.06E-05	lb/1000 gal	3.33E-05	1.46E-04	2.29E-05	
Metals							
Arsenic	7440-38-2	5.60E-04	lb/1000 gal	3.08E-04	1.35E-03	2.11E-04	E
Beryllium	7440-41-7	4.20E-04	lb/1000 gal	2.31E-04	1.01E-03	1.59E-04	E
Cadmium	7440-43-9	4.20E-04	lb/1000 gal	2.31E-04	1.01E-03	1.59E-04	E
Chromium	7440-47-3	4.20E-04	lb/1000 gal	2.31E-04	1.01E-03	1.59E-04	E
Copper	7440-50-8	8.40E-04	lb/1000 gal	4.62E-04	2.02E-03	3.17E-04	E
Lead	7139-92-1	1.26E-03	lb/1000 gal	6.93E-04	3.04E-03	4.76E-04	E
Manganese	7439-96-5	8.40E-04	lb/1000 gal	4.62E-04	2.02E-03	3.17E-04	E
Mercury	7439-97-6	4.20E-04	lb/1000 gal	2.31E-04	1.01E-03	1.59E-04	E
Nickel	7440-02-0	4.20E-04	lb/1000 gal	2.31E-04	1.01E-03	1.59E-04	E
Selenium	7782-49-2	2.10E-03	lb/1000 gal	1.16E-03	5.06E-03	7.93E-04	E
Zinc	7440-66-6	5.60E-04	lb/1000 gal	3.08E-04	1.35E-03	2.11E-04	E
Max HAP					7.95E-02	1.25E-02	
Total HAP					1.15E-01	1.81E-02	

## NOTES

- A AP-42 Table 1.3-1, 9/98
- B AP-42 Table 1.3-6, 9/98
- C Sulfur Content= 0.0015 % wt
- D AP-42 Table 1.3-9, 9/98
- E AP-42 Table 1.3-10, 9/98
- F This compound is considered polycyclic organic matter (POM)
- G AP-42 Table 1.3-12, 9/98
- H 40 CFR Part 98 Table C-1: Pipeline natural gas = 0.138 btu/gal, CO<sub>2</sub> emission = 73.96 kg CO<sub>2</sub>/mmBtu = 22,501 lb/1000 gal
- I 40 CFR Part 98 Table C-2: Pipeline natural gas = 0.138 btu/gal, CH<sub>4</sub> = 0.003 kg CH<sub>4</sub>/mmBtu, N<sub>2</sub>O = 0.0006 kg N<sub>2</sub>O / mmBtu
- J CO<sub>2</sub>e = (Global Warming Potential, GWP) \* (Emission). GWP from 40 CFR Part 98 Table A-1. CO<sub>2</sub> = 1, CH<sub>4</sub> = 21, N<sub>2</sub>O = 310

GP001 EMISSION CALCULATION SUMMARY							
Parameter	Value	Units	Source				
Emission Unit	GP001		EU001, EU002, EU003, EU004 MPCA Emission Unit ID				
Annual Fuel Oil Limit	755,000	gal/yr	State operating permit application, November 1995				
Natural Gas Limit	525	MMSCF/yr	State operating permit application, November 1995				
Criteria Pollutants							
		Emission Rate (Natural Gas) (lb/hr)	Emission Rate (Fuel Oil) (lb/hr)	Unlimited Emission Rate (tpy)	Limited Fuel Oil Emissions (tpy)	Limited NG Emissions (tpy)	Permit Limited Maximum GP001 Emissions (tpy)
Pollutant	CAS						
PM		1.22	3.87	16.9	1.25	2.00	3.24
PM10		1.22	2.69	11.8	0.87	2.00	2.86
PM2.5		1.22	1.82	8.0	0.59	2.00	2.58
SO2		0.10	0.25	1.1	0.08	0.16	0.24
NOx		16.08	23.43	102.6	7.55	26.25	33.80
VOC		0.88	0.65	3.9	0.21	1.44	1.65
CO		13.51	5.86	59.2	1.89	22.05	23.94
Greenhouse Gas (CO2e)		19,339	26,447	115,839	8,523	31,573	40,096
CO2		19,320	26,359	115,450	8,494	31,542	40,036
CH4		0.36	1.07	4.7	3.45E-01	5.95E-01	9.39E-01
N2O		0.04	0.21	0.9	6.89E-02	5.95E-02	1.28E-01
Organics							
Benzene	71-43-2	3.38E-04	2.51E-04	1.48E-03	8.08E-05	5.51E-04	6.32E-04
Butane	106-97-8	3.38E-01	0.00E+00	1.48E+00	0.00E+00	5.51E-01	5.51E-01
Dichlorobenzene	25321-22-6	1.93E-04	0.00E+00	8.45E-04	0.00E+00	3.15E-04	3.15E-04
Ethylbenzene	100-41-4	0.00E+00	7.45E-05	3.26E-04	2.40E-05	0.00E+00	2.40E-05
Ethane	74-84-0	4.98E-01	0.00E+00	2.18E+00	0.00E+00	8.14E-01	8.14E-01
Formaldehyde	50-00-0	1.21E-02	3.87E-02	1.69E-01	1.25E-02	1.97E-02	3.21E-02
Hexane	110-54-3	2.89E-01	0.00E+00	1.27E+00	0.00E+00	4.73E-01	4.73E-01
Naphthalene	91-20-3	9.81E-05	1.32E-03	5.80E-03	4.27E-04	1.60E-04	5.87E-04
Pentane	109-66-0	4.18E-01	0.00E+00	1.83E+00	0.00E+00	6.83E-01	6.83E-01
Propane	74-98-6	2.57E-01	0.00E+00	1.13E+00	0.00E+00	4.20E-01	4.20E-01
1,1,1-Trichloroethane	71-55-6	0.00E+00	2.76E-04	1.21E-03	8.91E-05	0.00E+00	8.91E-05
Toluene	108-88-3	5.47E-04	7.26E-03	3.18E-02	2.34E-03	8.93E-04	3.23E-03
Xylene (o,m,p)	1332-20-7	0.00E+00	1.28E-04	5.59E-04	4.11E-05	0.00E+00	4.11E-05
Acenaphthene	83-32-9	2.89E-07	2.47E-05	1.08E-04	7.97E-06	4.73E-07	8.44E-06
Acenaphthylene	203-96-8	2.89E-07	2.96E-07	1.30E-06	9.55E-08	4.73E-07	5.68E-07
Anthracene	120-12-7	3.86E-07	1.43E-06	6.26E-06	4.61E-07	6.30E-07	1.09E-06
Benz(a)anthracene	56-55-3	2.89E-07	4.70E-06	2.06E-05	1.51E-06	4.73E-07	1.99E-06
Benzo(a)pyrene	50-32-8	1.93E-07	0.00E+00	8.45E-07	0.00E+00	3.15E-07	3.15E-07
Benzo(b)fluoranthene	205-99-2	2.89E-07	0.00E+00	1.27E-06	0.00E+00	4.73E-07	4.73E-07
Benzo(b,k)fluoranthene	205-99-2	0.00E+00	1.73E-06	7.59E-06	5.59E-07	0.00E+00	5.59E-07
Benzo(g,h,i)perylene	191-24-2	1.93E-07	2.65E-06	1.16E-05	8.53E-07	3.15E-07	1.17E-06
Benzo(k)fluoranthene	205-82-3	2.89E-07	0.00E+00	1.27E-06	0.00E+00	4.73E-07	4.73E-07
Chrysene	218-01-9	2.89E-07	2.79E-06	1.22E-05	8.98E-07	4.73E-07	1.37E-06
Dibenzo(a,h)anthracene	53-70-3	1.93E-07	1.96E-06	8.57E-06	6.30E-07	3.15E-07	9.45E-07
7,12-Dimethylbenz(a)anthracene	57-97-6	2.57E-06	0.00E+00	1.13E-05	0.00E+00	4.20E-06	4.20E-06
Fluoranthene	206-44-0	4.82E-07	5.67E-06	2.48E-05	1.88E-06	7.88E-07	2.61E-06
Fluorene	86-73-7	4.50E-07	5.24E-06	2.29E-05	1.69E-06	7.35E-07	2.42E-06
Indeno(1,2,3-cd)pyrene	193-39-5	2.89E-07	2.51E-06	1.10E-05	8.08E-07	4.73E-07	1.28E-06
2-Methylnaphthalene	91-57-6	3.86E-06	0.00E+00	1.69E-05	0.00E+00	6.30E-06	6.30E-06
3-Methylchloranthrene	56-49-5	2.89E-07	0.00E+00	1.27E-06	0.00E+00	4.73E-07	4.73E-07
Phenanthrene	85-01-8	2.73E-06	1.23E-05	5.39E-05	3.96E-06	4.46E-06	8.43E-06
Pyrene	129-00-0	8.04E-06	4.98E-06	3.52E-05	1.60E-06	1.31E-05	1.47E-05
OCDD	3268-87-9	0.00E+00	3.63E-09	1.59E-08	1.17E-09	0.00E+00	1.17E-09
Polycyclic Organic Matter (POM)		2.14E-05	7.10E-05	3.11E-04	2.29E-05	3.50E-05	5.78E-05
Metals							
Arsenic	7440-38-2	3.22E-05	6.56E-04	2.87E-03	2.11E-04	5.25E-05	2.64E-04
Barium	7440-39-3	7.07E-04	0.00E+00	3.10E-03	0.00E+00	1.16E-03	1.16E-03
Beryllium	7440-41-7	1.93E-06	4.92E-04	2.15E-03	1.59E-04	3.15E-06	1.62E-04
Cadmium	7440-43-9	1.77E-04	4.92E-04	2.15E-03	1.59E-04	2.89E-04	4.47E-04
Chromium	7440-47-3	2.25E-04	4.92E-04	2.15E-03	1.59E-04	3.68E-04	5.26E-04
Cobalt	7440-48-4	1.35E-05	0.00E+00	5.92E-05	0.00E+00	2.21E-05	2.21E-05
Copper	7440-50-8	1.37E-04	9.84E-04	4.31E-03	3.17E-04	2.23E-04	5.40E-04
Lead	7139-92-1	8.04E-05	1.48E-03	6.46E-03	4.76E-04	1.31E-04	6.07E-04
Manganese	7439-96-5	6.11E-05	9.84E-04	4.31E-03	3.17E-04	9.98E-05	4.17E-04
Mercury	7439-97-6	4.18E-05	4.92E-04	2.15E-03	1.59E-04	6.83E-05	2.27E-04
Molybdenum	7439-98-7	1.77E-04	0.00E+00	7.75E-04	0.00E+00	2.89E-04	2.89E-04
Nickel	7440-02-0	3.38E-04	4.92E-04	2.15E-03	1.59E-04	5.51E-04	7.10E-04
Selenium	7782-49-2	3.86E-06	2.46E-03	1.08E-02	7.93E-04	6.30E-06	7.99E-04
Vanadium	7440-62-2	3.70E-04	0.00E+00	1.62E-03	0.00E+00	6.04E-04	6.04E-04
Zinc	7440-66-6	4.66E-03	6.56E-04	2.04E-02	2.11E-04	7.61E-03	7.82E-03
Max HAP					1.25E-02	4.73E-01	4.73E-01
Total HAP					1.81E-02	4.96E-01	5.14E-01

## NOTES

Please refer to Tables 2-9 for detailed calculations for each emission unit in GP001.

EU005 EMISSION CALCULATIONS (FUEL OIL)							
Parameter	Value	Units	Source				
Emission Unit	EU005		MPCA Emission Unit ID				
Make	Cummins		State operating permit application, November 1995				
Model	VT-1710-GS		State operating permit application, November 1995				
Maximum Output	685	bhp	State operating permit application, November 1995				
Fuel	No 2 Fuel Oil						
Maximum Fuel Input	32.54	gal/hr					
Unlimited Annual Operation	500	hr/yr	Emergency generator - unlimited is 500 hours per year				
Unlimited Annual Fuel Input	16,270	gal/yr	(Maximum Fuel Input) * (Unlimited Annual Operation)				
Annual Limit	300	hr/yr	Permit Limit				
Fuel Heat Value	0.14	MMBtu/gal	AP-42 Section 1.3				
Maximum Heat Input	4.56	MMBtu/hr	(Maximum Fuel Input) * (Fuel Heat Value)				
Criteria Pollutants							
Pollutant	CAS	Emission Factor		Unlimited Emission Rate (lb/hr)	Unlimited Emission Rate (tpy)	Limited Emission Rate (tpy)	NOTES
PM		0.0697	lb/MMBtu	0.318	0.08	0.05	C
PM10		0.0573	lb/MMBtu	0.261	0.07	0.04	C
PM2.5		0.0556	lb/MMBtu	0.253	0.06	0.04	C
SO2		0.00	lb/MMBtu	0.007	0.00	0.00	A, B
NOx		3.20	lb/MMBtu	14.578	3.64	2.19	A
VOC		0.09	lb/MMBtu	0.410	0.10	0.06	A
CO		0.85	lb/MMBtu	3.872	0.97	0.58	A
Greenhouse Gas (CO2e)		163.60	lb/MMBtu	745.301	186	112	G
CO2		163.1	lb/MMBtu	742.801	186	111	E
CH4		0.007	lb/MMBtu	0.030	0	0	F
N2O		0.001	lb/MMBtu	0.006	0	0	F
Organics							
Acetaldehyde	75-07-0	2.52E-05	lb/MMBtu	8.20E-07	2.05E-07	1.23E-07	D
Acrolein	107-02-8	7.88E-06	lb/MMBtu	2.56E-07	6.41E-08	3.85E-08	D
Benzene	71-43-2	7.76E-04	lb/MMBtu	3.54E-03	8.84E-04	5.30E-04	D
Formaldehyde	50-00-0	7.89E-05	lb/MMBtu	3.59E-04	8.99E-05	5.39E-05	D
Naphthalene	91-20-3	1.30E-04	lb/MMBtu	5.92E-04	1.48E-04	8.88E-05	D
Propylene		2.79E-03	lb/MMBtu	1.27E-02	3.18E-03	1.91E-03	D
Toluene	108-88-3	2.81E-04	lb/MMBtu	1.28E-03	3.20E-04	1.92E-04	D
Xylene (o,m,p)	1332-20-7	1.93E-04	lb/MMBtu	8.79E-04	2.20E-04	1.32E-04	D
Acenaphthene	83-32-9	4.68E-06	lb/MMBtu	2.13E-05	5.33E-06	3.20E-06	D
Acenaphthylene	203-96-8	9.23E-06	lb/MMBtu	4.20E-05	1.05E-05	6.31E-06	D
Anthracene	120-12-7	1.23E-06	lb/MMBtu	5.60E-06	1.40E-06	8.41E-07	D
Benz(a)anthracene	56-55-3	6.22E-07	lb/MMBtu	2.83E-06	7.08E-07	4.25E-07	D
Benzo(a)pyrene	50-32-8	2.57E-07	lb/MMBtu	1.17E-06	2.93E-07	1.76E-07	D
Benzo(b)fluoranthene	205-99-2	1.11E-06	lb/MMBtu	5.06E-06	1.26E-06	7.59E-07	D
Benzo(g,h,i)perylene	191-24-2	5.56E-07	lb/MMBtu	2.53E-06	6.33E-07	3.80E-07	D
Benzo(k)fluoranthene	205-82-3	2.18E-07	lb/MMBtu	9.93E-07	2.48E-07	1.49E-07	D
Chrysene	218-01-9	1.53E-06	lb/MMBtu	6.97E-06	1.74E-06	1.05E-06	D
Dibenzo(a,h)anthracene	53-70-3	3.46E-07	lb/MMBtu	1.58E-06	3.94E-07	2.36E-07	D
Fluoranthene	206-44-0	4.03E-06	lb/MMBtu	1.84E-05	4.59E-06	2.75E-06	D
Fluorene	86-73-7	1.28E-05	lb/MMBtu	5.83E-05	1.46E-05	8.75E-06	D
Indeno(1,2,3-cd)pyrene	193-39-5	4.14E-07	lb/MMBtu	1.89E-06	4.72E-07	2.83E-07	D
Phenanthrene	85-01-8	4.08E-05	lb/MMBtu	1.86E-04	4.65E-05	2.79E-05	D
Pyrene	129-00-0	3.71E-06	lb/MMBtu	1.69E-05	4.23E-06	2.54E-06	D
Polycyclic Organic Matter (POM)					9.29E-05	5.57E-05	
Max HAP					8.84E-04	5.30E-04	
Total HAP					1.75E-03	1.05E-03	

## NOTES

- A AP-42 Table 3.4-1
- B Sulfur Content= 0.0015 % wt
- C AP-42 Table 3.4-2
- D AP-42 Table 3.4-3 and 3.4-4
- E 40 CFR Part 98 Table C-1: Pipeline natural gas = 1028 btu/scf, CO<sub>2</sub> emission = 53.02 kg CO<sub>2</sub>/mmBtu = 120162 lb/MMscf
- F 40 CFR Part 98 Table C-2: Pipeline natural gas = 1028 btu/scf, CH<sub>4</sub> = 0.001 kig CH<sub>4</sub>/mmBtu, N<sub>2</sub>O = 0.0001 kg N<sub>2</sub>O / mmBtu
- G CO<sub>2</sub>e = (Global Warming Potential, GWP) \* (Emission). GWP from 40 CFR Part 98 Table A-1. CO<sub>2</sub> = 1, CH<sub>4</sub> = 21, N<sub>2</sub>O = 310

EU006 EMISSION CALCULATIONS (FUEL OIL)							
Parameter	Value	Units	Source				
Emission Unit	EU006		MPCA Emission Unit ID				
Make	Cummins		State operating permit application, November 1995				
Model	VT-1710-GS		State operating permit application, November 1995				
Maximum Output	685	bhp	State operating permit application, November 1995				
Fuel	No 2 Fuel Oil						
Maximum Fuel Input	32.54	gal/hr					
Unlimited Annual Operation	500	hr/yr	Emergency generator limited to 500 hours per year				
Unlimited Annual Fuel Input	16,270	gal/yr	(Maximum Fuel Input) * (Unlimited Annual Operation)				
Annual Limit	300	hr/yr	Permit Limit				
Fuel Heat Value	0.14	MMBtu/gal	AP-42 Section 1.3				
Maximum Heat Input	4.56	MMBtu/hr	(Maximum Fuel Input) * (Fuel Heat Value)				
Criteria Pollutants							
Pollutant	CAS	Emission Factor		Unlimited Emission Rate (lb/hr)	Unlimited Emission Rate (tpy)	Limited Emission Rate (tpy)	NOTES
PM		0.0697	lb/MMBtu	0.318	0.08	0.05	C
PM10		0.0573	lb/MMBtu	0.261	0.07	0.04	C
PM2.5		0.0556	lb/MMBtu	0.253	0.06	0.04	C
SO2		0.00	lb/MMBtu	0.007	0.00	0.00	A, B
NOx		3.20	lb/MMBtu	14.578	3.64	2.19	A
VOC		0.09	lb/MMBtu	0.410	0.10	0.06	A
CO		0.85	lb/MMBtu	3.872	0.97	0.58	A
Greenhouse Gas (CO2e)		163.60	lb/MMBtu	745.301	186	112	G
CO2		163.1	lb/MMBtu	742.801	186	111	E
CH4		0.007	lb/MMBtu	0.030	0	0	F
N2O		0.001	lb/MMBtu	0.006	0	0	F
Organics							
Acetaldehyde	75-07-0	2.52E-05	lb/MMBtu	8.20E-07	2.05E-07	1.23E-07	D
Acrolein	107-02-8	7.88E-06	lb/MMBtu	2.56E-07	6.41E-08	3.85E-08	D
Benzene	71-43-2	7.76E-04	lb/MMBtu	3.54E-03	8.84E-04	5.30E-04	D
Formaldehyde	50-00-0	7.89E-05	lb/MMBtu	3.59E-04	8.99E-05	5.39E-05	D
Naphthalene	91-20-3	1.30E-04	lb/MMBtu	5.92E-04	1.48E-04	8.88E-05	D
Propylene		2.79E-03	lb/MMBtu	1.27E-02	3.18E-03	1.91E-03	D
Toluene	108-88-3	2.81E-04	lb/MMBtu	1.28E-03	3.20E-04	1.92E-04	D
Xylene (o,m,p)	1332-20-7	1.93E-04	lb/MMBtu	8.79E-04	2.20E-04	1.32E-04	D
Acenaphthene	83-32-9	4.68E-06	lb/MMBtu	2.13E-05	5.33E-06	3.20E-06	D
Acenaphthylene	203-96-8	9.23E-06	lb/MMBtu	4.20E-05	1.05E-05	6.31E-06	D
Anthracene	120-12-7	1.23E-06	lb/MMBtu	5.60E-06	1.40E-06	8.41E-07	D
Benz(a)anthracene	56-55-3	6.22E-07	lb/MMBtu	2.83E-06	7.08E-07	4.25E-07	D
Benzo(a)pyrene	50-32-8	2.57E-07	lb/MMBtu	1.17E-06	2.93E-07	1.76E-07	D
Benzo(b)fluoranthene	205-99-2	1.11E-06	lb/MMBtu	5.06E-06	1.26E-06	7.59E-07	D
Benzo(g,h,i)perylene	191-24-2	5.56E-07	lb/MMBtu	2.53E-06	6.33E-07	3.80E-07	D
Benzo(k)fluoranthene	205-82-3	2.18E-07	lb/MMBtu	9.93E-07	2.48E-07	1.49E-07	D
Chrysene	218-01-9	1.53E-06	lb/MMBtu	6.97E-06	1.74E-06	1.05E-06	D
Dibenzo(a,h)anthracene	53-70-3	3.46E-07	lb/MMBtu	1.58E-06	3.94E-07	2.36E-07	D
Fluoranthene	206-44-0	4.03E-06	lb/MMBtu	1.84E-05	4.59E-06	2.75E-06	D
Fluorene	86-73-7	1.28E-05	lb/MMBtu	5.83E-05	1.46E-05	8.75E-06	D
Indeno(1,2,3-cd)pyrene	193-39-5	4.14E-07	lb/MMBtu	1.89E-06	4.72E-07	2.83E-07	D
Phenanthrene	85-01-8	4.08E-05	lb/MMBtu	1.86E-04	4.65E-05	2.79E-05	D
Pyrene	129-00-0	3.71E-06	lb/MMBtu	1.69E-05	4.23E-06	2.54E-06	D
Polycyclic Organic Matter (POM)					9.29E-05	5.57E-05	
Max HAP					8.84E-04	5.30E-04	
Total HAP					1.75E-03	1.05E-03	

## NOTES

- A AP-42 Table 3.4-1  
 B Sulfur Content= 0.0015 % wt  
 C AP-42 Table 3.4-2  
 D AP-42 Table 3.4-3 and 3.4-4

EU007 EMISSION CALCULATIONS (FUEL OIL)							
Parameter	Value	Units	Source				
Emission Unit	EU007		MPCA Emission Unit ID				
Make	Cummins		State operating permit application, November 1995				
Model	KTGA 19-G1		State operating permit application, November 1995				
Maximum Output	685	bhp	State operating permit application, November 1995				
Fuel	No 2 Fuel Oil						
Maximum Fuel Input	36.61	gal/hr					
Unlimited Annual Operation	500	hr/yr	Assumed because generator can participate in a peak shaving program				
Unlimited Annual Fuel Input	18,305	gal/yr	(Maximum Fuel Input) * (Unlimited Annual Operation)				
Annual Limit	300	hr/yr	Permit Limit				
Fuel Heat Value	0.14	MMBtu/gal	AP-42 Section 1.3				
Maximum Heat Input	5.13	MMBtu/hr	(Maximum Fuel Input) * (Fuel Heat Value)				
Criteria Pollutants							
Pollutant	CAS	Emission Factor		Unlimited Emission Rate (lb/hr)	Unlimited Emission Rate (tpy)	Limited Emission Rate (tpy)	NOTES
PM		0.0697	lb/MMBtu	0.357	0.09	0.05	C
PM10		0.0573	lb/MMBtu	0.294	0.07	0.04	C
PM2.5		0.0556	lb/MMBtu	0.285	0.07	0.04	C
SO2		0.00	lb/MMBtu	0.008	0.00	0.00	A, B
NOx		3.20	lb/MMBtu	16.401	4.10	2.46	A
VOC		0.09	lb/MMBtu	0.461	0.12	0.07	A
CO		0.85	lb/MMBtu	4.357	1.09	0.65	A
Greenhouse Gas (CO2e)		163.60	lb/MMBtu	838.521	210	126	G
CO2		163.1	lb/MMBtu	835.708	209	125	E
CH4		0.007	lb/MMBtu	0.034	0	0	F
N2O		0.001	lb/MMBtu	0.007	0	0	F
Organics							
Acetaldehyde	75-07-0	2.52E-05	lb/MMBtu	9.23E-07	2.31E-07	1.38E-07	D
Acrolein	107-02-8	7.88E-06	lb/MMBtu	2.88E-07	7.21E-08	4.33E-08	D
Benzene	71-43-2	7.76E-04	lb/MMBtu	3.98E-03	9.94E-04	5.97E-04	D
Formaldehyde	50-00-0	7.89E-05	lb/MMBtu	4.04E-04	1.01E-04	6.07E-05	D
Naphthalene	91-20-3	1.30E-04	lb/MMBtu	6.66E-04	1.67E-04	9.99E-05	D
Propylene		2.79E-03	lb/MMBtu	1.43E-02	3.57E-03	2.14E-03	D
Toluene	108-88-3	2.81E-04	lb/MMBtu	1.44E-03	3.60E-04	2.16E-04	D
Xylene (o,m,p)	1332-20-7	1.93E-04	lb/MMBtu	9.89E-04	2.47E-04	1.48E-04	D
Acenaphthene	83-32-9	4.68E-06	lb/MMBtu	2.40E-05	6.00E-06	3.60E-06	D
Acenaphthylene	203-96-8	9.23E-06	lb/MMBtu	4.73E-05	1.18E-05	7.10E-06	D
Anthracene	120-12-7	1.23E-06	lb/MMBtu	6.30E-06	1.58E-06	9.46E-07	D
Benz(a)anthracene	56-55-3	6.22E-07	lb/MMBtu	3.19E-06	7.97E-07	4.78E-07	D
Benzo(a)pyrene	50-32-8	2.57E-07	lb/MMBtu	1.32E-06	3.29E-07	1.98E-07	D
Benzo(b)fluoranthene	205-99-2	1.11E-06	lb/MMBtu	5.69E-06	1.42E-06	8.53E-07	D
Benzo(g,h,i)perylene	191-24-2	5.56E-07	lb/MMBtu	2.85E-06	7.12E-07	4.27E-07	D
Benzo(k)fluoranthene	205-82-3	2.18E-07	lb/MMBtu	1.12E-06	2.79E-07	1.68E-07	D
Chrysene	218-01-9	1.53E-06	lb/MMBtu	7.84E-06	1.96E-06	1.18E-06	D
Dibenzo(a,h)anthracene	53-70-3	3.46E-07	lb/MMBtu	1.77E-06	4.43E-07	2.66E-07	D
Fluoranthene	206-44-0	4.03E-06	lb/MMBtu	2.07E-05	5.16E-06	3.10E-06	D
Fluorene	86-73-7	1.28E-05	lb/MMBtu	6.56E-05	1.64E-05	9.84E-06	D
Indeno(1,2,3-cd)pyrene	193-39-5	4.14E-07	lb/MMBtu	2.12E-06	5.30E-07	3.18E-07	D
Phenanthrene	85-01-8	4.08E-05	lb/MMBtu	2.09E-04	5.23E-05	3.14E-05	D
Pyrene	129-00-0	3.71E-06	lb/MMBtu	1.90E-05	4.75E-06	2.85E-06	D
Polycyclic Organic Matter (POM)					1.04E-04	6.27E-05	
Max HAP					9.94E-04	5.97E-04	
Total HAP					1.97E-03	1.18E-03	

## NOTES

- A AP-42 Table 3.4-1  
 B Sulfur Content= 0.0015 % wt  
 C AP-42 Table 3.4-2  
 D AP-42 Table 3.4-3 and 3.4-4

EU008 EMISSION CALCULATIONS (FUEL OIL)							
Parameter	Value	Units	Source				
Emission Unit	EU008		MPCA Emission Unit ID				
Make	Onan		State operating permit application, November 1995				
Model	KT TA 19-G1		State operating permit application, November 1995				
Maximum Output	685	bhp	State operating permit application, November 1995				
Fuel	No 2 Fuel Oil						
Maximum Fuel Input	36.61	gal/hr					
Unlimited Annual Operation	500	hr/yr	Assumed because generator can participate in a peak shaving program				
Unlimited Annual Fuel Input	18,305	gal/yr	(Maximum Fuel Input) * (Unlimited Annual Operation)				
Annual Limit	300	hr/yr	Permit Limit				
Fuel Heat Value	0.14	MMBtu/gal	AP-42 Section 1.3				
Maximum Heat Input	5.13	MMBtu/hr	(Maximum Fuel Input) * (Fuel Heat Value)				
Criteria Pollutants							
Pollutant	CAS	Emission Factor		Unlimited Emission Rate (lb/hr)	Unlimited Emission Rate (tpy)	Limited Emission Rate (tpy)	NOTES
PM		0.0697	lb/MMBtu	0.357	0.09	0.05	C
PM10		0.0573	lb/MMBtu	0.294	0.07	0.04	C
PM2.5		0.0556	lb/MMBtu	0.285	0.07	0.04	C
SO2		0.00	lb/MMBtu	0.008	0.00	0.00	A, B
NOx		3.20	lb/MMBtu	16.401	4.10	2.46	A
VOC		0.09	lb/MMBtu	0.461	0.12	0.07	A
CO		0.85	lb/MMBtu	4.357	1.09	0.65	A
Greenhouse Gas (CO2e)		163.60	lb/MMBtu	838.521	210	126	G
CO2		163.1	lb/MMBtu	835.708	209	125	E
CH4		0.007	lb/MMBtu	0.034	0	0	F
N2O		0.001	lb/MMBtu	0.007	0	0	F
Organics							
Acetaldehyde	75-07-0	2.52E-05	lb/MMBtu	9.23E-07	2.31E-07	1.38E-07	D
Acrolein	107-02-8	7.88E-06	lb/MMBtu	2.88E-07	7.21E-08	4.33E-08	D
Benzene	71-43-2	7.76E-04	lb/MMBtu	3.98E-03	9.94E-04	5.97E-04	D
Formaldehyde	50-00-0	7.89E-05	lb/MMBtu	4.04E-04	1.01E-04	6.07E-05	D
Naphthalene	91-20-3	1.30E-04	lb/MMBtu	6.66E-04	1.67E-04	9.99E-05	D
Propylene		2.79E-03	lb/MMBtu	1.43E-02	3.57E-03	2.14E-03	D
Toluene	108-88-3	2.81E-04	lb/MMBtu	1.44E-03	3.60E-04	2.16E-04	D
Xylene (o,m,p)	1332-20-7	1.93E-04	lb/MMBtu	9.89E-04	2.47E-04	1.48E-04	D
Acenaphthene	83-32-9	4.68E-06	lb/MMBtu	2.40E-05	6.00E-06	3.60E-06	D
Acenaphthylene	203-96-8	9.23E-06	lb/MMBtu	4.73E-05	1.18E-05	7.10E-06	D
Anthracene	120-12-7	1.23E-06	lb/MMBtu	6.30E-06	1.58E-06	9.46E-07	D
Benz(a)anthracene	56-55-3	6.22E-07	lb/MMBtu	3.19E-06	7.97E-07	4.78E-07	D
Benzo(a)pyrene	50-32-8	2.57E-07	lb/MMBtu	1.32E-06	3.29E-07	1.98E-07	D
Benzo(b)fluoranthene	205-99-2	1.11E-06	lb/MMBtu	5.69E-06	1.42E-06	8.53E-07	D
Benzo(g,h,i)perylene	191-24-2	5.56E-07	lb/MMBtu	2.85E-06	7.12E-07	4.27E-07	D
Benzo(k)fluoranthene	205-82-3	2.18E-07	lb/MMBtu	1.12E-06	2.79E-07	1.68E-07	D
Chrysene	218-01-9	1.53E-06	lb/MMBtu	7.84E-06	1.96E-06	1.18E-06	D
Dibenzo(a,h)anthracene	53-70-3	3.46E-07	lb/MMBtu	1.77E-06	4.43E-07	2.66E-07	D
Fluoranthene	206-44-0	4.03E-06	lb/MMBtu	2.07E-05	5.16E-06	3.10E-06	D
Fluorene	86-73-7	1.28E-05	lb/MMBtu	6.56E-05	1.64E-05	9.84E-06	D
Indeno(1,2,3-cd)pyrene	193-39-5	4.14E-07	lb/MMBtu	2.12E-06	5.30E-07	3.18E-07	D
Phenanthrene	85-01-8	4.08E-05	lb/MMBtu	2.09E-04	5.23E-05	3.14E-05	D
Pyrene	129-00-0	3.71E-06	lb/MMBtu	1.90E-05	4.75E-06	2.85E-06	D
Polycyclic Organic Matter (POM)					1.04E-04	6.27E-05	
Max HAP					9.94E-04	5.97E-04	
Total HAP					1.97E-03	1.18E-03	

## NOTES

- A AP-42 Table 3.4-1  
 B Sulfur Content= 0.0015 % wt  
 C AP-42 Table 3.4-2  
 D AP-42 Table 3.4-3 and 3.4-4

EU009 EMISSION CALCULATIONS (FUEL OIL)							
Parameter	Value	Units	Source				
Emission Unit	EU009		MPCA Emission Unit ID				
Make	0		State operating permit application, November 1995				
Model	Onan		State operating permit application, November 1995				
Maximum Output	890	bhp	State operating permit application, November 1995				
Fuel	No 2 Fuel Oil						
Maximum Fuel Input	48.81	gal/hr					
Unlimited Annual Operation	500	hr/yr	Assumed because generator can participate in a peak shaving program				
Unlimited Annual Fuel Input	24,405	gal/yr	(Maximum Fuel Input) * (Unlimited Annual Operation)				
Annual Limit	300	hr/yr	Permit Limit				
Fuel Heat Value	0.14	MMBtu/gal	AP-42 Section 1.3				
Maximum Heat Input	6.83	MMBtu/hr	(Maximum Fuel Input) * (Fuel Heat Value)				
Criteria Pollutants							
Pollutant	CAS	Emission Factor		Unlimited Emission Rate (lb/hr)	Unlimited Emission Rate (tpy)	Limited Emission Rate (tpy)	NOTES
PM		0.0697	lb/MMBtu	0.476	0.12	0.07	C
PM10		0.0573	lb/MMBtu	0.392	0.10	0.06	C
PM2.5		0.0556	lb/MMBtu	0.380	0.09	0.06	C
SO2		0.00	lb/MMBtu	0.010	0.00	0.00	A, B
NOx		3.20	lb/MMBtu	21.867	5.47	3.28	A
VOC		0.09	lb/MMBtu	0.615	0.15	0.09	A
CO		0.85	lb/MMBtu	5.808	1.45	0.87	A
Greenhouse Gas (CO2e)		163.60	lb/MMBtu	1,117.952	279	168	G
CO2		163.1	lb/MMBtu	1,114.201	279	167	E
CH4		0.007	lb/MMBtu	0.045	0	0	F
N2O		0.001	lb/MMBtu	0.009	0	0	F
Organics							
Acetaldehyde	75-07-0	2.52E-05	lb/MMBtu	1.23E-06	3.08E-07	1.85E-07	D
Acrolein	107-02-8	7.88E-06	lb/MMBtu	3.85E-07	9.62E-08	5.77E-08	D
Benzene	71-43-2	7.76E-04	lb/MMBtu	5.30E-03	1.33E-03	7.95E-04	D
Formaldehyde	50-00-0	7.89E-05	lb/MMBtu	5.39E-04	1.35E-04	8.09E-05	D
Naphthalene	91-20-3	1.30E-04	lb/MMBtu	8.88E-04	2.22E-04	1.33E-04	D
Propylene		2.79E-03	lb/MMBtu	1.91E-02	4.77E-03	2.86E-03	D
Toluene	108-88-3	2.81E-04	lb/MMBtu	1.92E-03	4.80E-04	2.88E-04	D
Xylene (o,m,p)	1332-20-7	1.93E-04	lb/MMBtu	1.32E-03	3.30E-04	1.98E-04	D
Acenaphthene	83-32-9	4.68E-06	lb/MMBtu	3.20E-05	8.00E-06	4.80E-06	D
Acenaphthylene	203-96-8	9.23E-06	lb/MMBtu	6.31E-05	1.58E-05	9.46E-06	D
Anthracene	120-12-7	1.23E-06	lb/MMBtu	8.41E-06	2.10E-06	1.26E-06	D
Benz(a)anthracene	56-55-3	6.22E-07	lb/MMBtu	4.25E-06	1.06E-06	6.38E-07	D
Benzo(a)pyrene	50-32-8	2.57E-07	lb/MMBtu	1.76E-06	4.39E-07	2.63E-07	D
Benzo(b)fluoranthene	205-99-2	1.11E-06	lb/MMBtu	7.59E-06	1.90E-06	1.14E-06	D
Benzo(g,h,i)perylene	191-24-2	5.56E-07	lb/MMBtu	3.80E-06	9.50E-07	5.70E-07	D
Benzo(k)fluoranthene	205-82-3	2.18E-07	lb/MMBtu	1.49E-06	3.72E-07	2.23E-07	D
Chrysene	218-01-9	1.53E-06	lb/MMBtu	1.05E-05	2.61E-06	1.57E-06	D
Dibenzo(a,h)anthracene	53-70-3	3.46E-07	lb/MMBtu	2.36E-06	5.91E-07	3.55E-07	D
Fluoranthene	206-44-0	4.03E-06	lb/MMBtu	2.75E-05	6.88E-06	4.13E-06	D
Fluorene	86-73-7	1.28E-05	lb/MMBtu	8.75E-05	2.19E-05	1.31E-05	D
Indeno(1,2,3-cd)pyrene	193-39-5	4.14E-07	lb/MMBtu	2.83E-06	7.07E-07	4.24E-07	D
Phenanthrene	85-01-8	4.08E-05	lb/MMBtu	2.79E-04	6.97E-05	4.18E-05	D
Pyrene	129-00-0	3.71E-06	lb/MMBtu	2.54E-05	6.34E-06	3.80E-06	D
Polycyclic Organic Matter (POM)					1.39E-04	8.36E-05	
Max HAP					1.33E-03	7.95E-04	
Total HAP					2.63E-03	1.58E-03	

## NOTES

- A AP-42 Table 3.4-1  
 B Sulfur Content= 0.0015 % wt  
 C AP-42 Table 3.4-2  
 D AP-42 Table 3.4-3 and 3.4-4



EU010 EMISSION CALCULATIONS (FUEL OIL)							
Parameter	Value	Units	Source				
Emission Unit	EU010		MPCA Emission Unit ID				
Make	Cummins		State operating permit application, November 1995				
Model	NT-855-GS		State operating permit application, November 1995				
Maximum Output	355	bhp	State operating permit application, November 1995				
Fuel	No 2 Fuel Oil						
Maximum Fuel Input	17.09	gal/hr					
Unlimited Annual Operation	500	hr/yr	Unlimited Operation for an emergency generator = 500 hours/yr				
Unlimited Annual Fuel Input	8,545	gal/yr	(Maximum Fuel Input) * (Unlimited Annual Operation)				
Annual Limit	300	hr/yr	Permit Limit				
Fuel Heat Value	0.14	MMBtu/gal	AP-42 Section 1.3				
Maximum Heat Input	2.39	MMBtu/hr	(Maximum Fuel Input) * (Fuel Heat Value)				
Criteria Pollutants							
Pollutant	CAS	Emission Factor		Unlimited Emission Rate (lb/hr)	Unlimited Emission Rate (tpy)	Limited Emission Rate (tpy)	NOTES
PM		0.3100	lb/MMBtu	0.742	0.19	0.11	C
PM10		0.3100	lb/MMBtu	0.742	0.19	0.11	C
PM2.5		0.3100	lb/MMBtu	0.742	0.19	0.11	C
SO2		0.002	lb/MMBtu	0.004	0.00	0.00	A, B
NOx		4.41	lb/MMBtu	10.551	2.64	1.58	C
VOC		0.35	lb/MMBtu	0.837	0.21	0.13	C
CO		0.95	lb/MMBtu	2.273	0.57	0.34	C
Greenhouse Gas (CO2e)		163.60	lb/MMBtu	391.432	98	59	G
CO2		163.1	lb/MMBtu	390.119	98	59	E
CH4		0.007	lb/MMBtu	0.016	0.004	0.002	F
N2O		0.001	lb/MMBtu	0.003	0.001	0.000	F
Organics							
Acetaldehyde	75-07-0	2.52E-05	lb/MMBtu	4.31E-07	1.08E-07	6.46E-08	D
Acrolein	107-02-8	7.88E-06	lb/MMBtu	1.35E-07	3.37E-08	2.02E-08	D
Benzene	71-43-2	7.76E-04	lb/MMBtu	1.86E-03	4.64E-04	2.78E-04	D
Formaldehyde	50-00-0	7.89E-05	lb/MMBtu	1.89E-04	4.72E-05	2.83E-05	D
Naphthalene	91-20-3	1.30E-04	lb/MMBtu	3.11E-04	7.78E-05	4.67E-05	D
Propylene		2.79E-03	lb/MMBtu	6.68E-03	1.67E-03	1.00E-03	D
Toluene	108-88-3	2.81E-04	lb/MMBtu	6.72E-04	1.68E-04	1.01E-04	D
Xylene (o,m,p)	1332-20-7	1.93E-04	lb/MMBtu	4.62E-04	1.15E-04	6.93E-05	D
Acenaphthene	83-32-9	4.68E-06	lb/MMBtu	1.12E-05	2.80E-06	1.68E-06	D
Acenaphthylene	203-96-8	9.23E-06	lb/MMBtu	2.21E-05	5.52E-06	3.31E-06	D
Anthracene	120-12-7	1.23E-06	lb/MMBtu	2.94E-06	7.36E-07	4.41E-07	D
Benz(a)anthracene	56-55-3	6.22E-07	lb/MMBtu	1.49E-06	3.72E-07	2.23E-07	D
Benzo(a)pyrene	50-32-8	2.57E-07	lb/MMBtu	6.15E-07	1.54E-07	9.22E-08	D
Benzo(b)fluoranthene	205-99-2	1.11E-06	lb/MMBtu	2.66E-06	6.64E-07	3.98E-07	D
Benzo(g,h,i)perylene	191-24-2	5.56E-07	lb/MMBtu	1.33E-06	3.33E-07	2.00E-07	D
Benzo(k)fluoranthene	205-82-3	2.18E-07	lb/MMBtu	5.22E-07	1.30E-07	7.82E-08	D
Chrysene	218-01-9	1.53E-06	lb/MMBtu	3.66E-06	9.15E-07	5.49E-07	D
Dibenzo(a,h)anthracene	53-70-3	3.46E-07	lb/MMBtu	8.28E-07	2.07E-07	1.24E-07	D
Fluoranthene	206-44-0	4.03E-06	lb/MMBtu	9.64E-06	2.41E-06	1.45E-06	D
Fluorene	86-73-7	1.28E-05	lb/MMBtu	3.06E-05	7.66E-06	4.59E-06	D
Indeno(1,2,3-cd)pyrene	193-39-5	4.14E-07	lb/MMBtu	9.91E-07	2.48E-07	1.49E-07	D
Phenanthrene	85-01-8	4.08E-05	lb/MMBtu	9.76E-05	2.44E-05	1.46E-05	D
Pyrene	129-00-0	3.71E-06	lb/MMBtu	8.88E-06	2.22E-06	1.33E-06	D
Polycyclic Organic Matter (POM)					4.88E-05	2.93E-05	
Max HAP					4.64E-04	2.78E-04	
Total HAP					9.21E-04	5.53E-04	

## NOTES

- A AP-42 Table 3.4-1
- B Sulfur Content= 0.0015 % wt
- C AP-42 Table 3.3-1
- D AP-42 Table 3.4-3 and 3.4-4
- E 40 CFR Part 98 Table C-1
- F 40 CFR Part 98 Table C-2
- G CO<sub>2</sub>e = (Global Warming Potential, GWP) \* (Emission). GWP from 40 CFR Part 98 Table A-1. CO<sub>2</sub> = 1, CH<sub>4</sub> = 21, N<sub>2</sub>O = 310



TABLE A17 : GP02 EMISSION CALCULATION SUMMARY

TABLE A17 : GP02 EMISSION CALCULATION SUMMARY								
Parameter	Value	Units	Source					
Emission Unit	GP002		MPCA Emission Unit ID					
Annual Operating Limit	300	hr/yr	Each Generator in GP002 (EU005-010)					
Criteria Pollutants								
		EU005 Limited Emissions (tpy)	EU006 Limited Emissions (tpy)	EU007 Limited Emissions (tpy)	EU008 Limited Emissions (tpy)	EU009 Limited Emissions (tpy)	EU010 Limited Emissions (tpy)	GP002 Limited Emissions (tpy)
Pollutant	CAS							
PM		0.05	0.05	0.05	0.05	0.07	0.11	0.39
PM10		0.04	0.04	0.04	0.04	0.06	0.11	0.34
PM2.5		0.04	0.04	0.04	0.04	0.06	0.11	0.33
SO2		0.00	0.00	0.00	0.00	0.00	0.00	0.01
NOx		2.19	2.19	2.46	2.46	3.28	1.58	14.16
VOC		0.06	0.06	0.07	0.07	0.09	0.13	0.48
CO		0.58	0.58	0.65	0.65	0.87	0.34	3.68
Greenhouse Gas (CO2e)		112	112	126	126	168	59	702
CO2		111	111	125	125	167	59	699
CH4		4.52E-03	4.52E-03	5.08E-03	5.08E-03	6.78E-03	2.37E-03	2.84E-02
N2O		9.04E-04	9.04E-04	1.02E-03	1.02E-03	1.36E-03	4.75E-04	5.67E-03
Organics								
Acetaldehyde	75-07-0	1.23E-07	1.23E-07	1.38E-07	1.38E-07	1.85E-07	6.46E-08	7.72E-07
Acrolein	107-02-8	3.85E-08	3.85E-08	4.33E-08	4.33E-08	5.77E-08	2.02E-08	2.41E-07
Benzene	71-43-2	5.30E-04	5.30E-04	5.97E-04	5.97E-04	7.95E-04	2.78E-04	3.33E-03
Formaldehyde	50-00-0	5.39E-05	5.39E-05	6.07E-05	6.07E-05	8.09E-05	2.83E-05	3.38E-04
Naphthalene	91-20-3	8.88E-05	8.88E-05	9.99E-05	9.99E-05	1.33E-04	4.67E-05	5.57E-04
Propylene		1.91E-03	1.91E-03	2.14E-03	2.14E-03	2.86E-03	1.00E-03	1.20E-02
Toluene	108-88-3	1.92E-04	1.92E-04	2.16E-04	2.16E-04	2.88E-04	1.01E-04	1.20E-03
Xylene (o,m,p)	1332-20-7	1.32E-04	1.32E-04	1.48E-04	1.48E-04	1.98E-04	6.93E-05	8.28E-04
Acenaphthene	83-32-9	3.20E-06	3.20E-06	3.60E-06	3.60E-06	4.80E-06	1.68E-06	2.01E-05
Acenaphthylene	203-96-8	6.31E-06	6.31E-06	7.10E-06	7.10E-06	9.46E-06	3.31E-06	3.96E-05
Anthracene	120-12-7	8.41E-07	8.41E-07	9.46E-07	9.46E-07	1.26E-06	4.41E-07	5.27E-06
Benz(a)anthracene	56-55-3	4.25E-07	4.25E-07	4.78E-07	4.78E-07	6.38E-07	2.23E-07	2.67E-06
Benzo(a)pyrene	50-32-8	1.76E-07	1.76E-07	1.98E-07	1.98E-07	2.63E-07	9.22E-08	1.10E-06
Benzo(b)fluoranthene	205-99-2	7.59E-07	7.59E-07	8.53E-07	8.53E-07	1.14E-06	3.98E-07	4.76E-06
Benzo(g,h,i)perylene	191-24-2	3.80E-07	3.80E-07	4.27E-07	4.27E-07	5.70E-07	2.00E-07	2.38E-06
Benzo(k)fluoranthene	205-82-3	1.49E-07	1.49E-07	1.68E-07	1.68E-07	2.23E-07	7.82E-08	9.35E-07
Chrysene	218-01-9	1.05E-06	1.05E-06	1.18E-06	1.18E-06	1.57E-06	5.49E-07	6.56E-06
Dibenzo(a,h)anthracene	53-70-3	2.36E-07	2.36E-07	2.66E-07	2.66E-07	3.55E-07	1.24E-07	1.48E-06
Fluoranthene	206-44-0	2.75E-06	2.75E-06	3.10E-06	3.10E-06	4.13E-06	1.45E-06	1.73E-05
Fluorene	86-73-7	8.75E-06	8.75E-06	9.84E-06	9.84E-06	1.31E-05	4.59E-06	5.49E-05
Indeno(1,2,3-cd)pyrene	193-39-5	2.83E-07	2.83E-07	3.18E-07	3.18E-07	4.24E-07	1.49E-07	1.78E-06
Phenanthrene	85-01-8	2.79E-05	2.79E-05	3.14E-05	3.14E-05	4.18E-05	1.46E-05	1.75E-04
Pyrene	129-00-0	2.54E-06	2.54E-06	2.85E-06	2.85E-06	3.80E-06	1.33E-06	1.59E-05
Polycyclic Organic Matter (POM)		5.57E-05	5.57E-05	6.27E-05	6.27E-05	8.36E-05	2.93E-05	3.50E-04
Max HAP								5.97E-04
Total HAP								1.18E-03

## NOTES

Please refer to Tables 11-16 for detailed calculations for each emission unit in GP002.

TABLE A18 : EU011-014 EMISSION CALCULATIONS (NATURAL GAS)									
Parameter	Value	Units	Source						
Emission Unit	EU011 - 014		MPCA Emission Unit ID						
Make	Cleaver Brooks		State operating permit application, November 1995						
Model	FLX-900		State operating permit application, November 1995						
Maximum Heat Input (per boiler)	8.742	MMBtu/hr	Per Boiler						
Fuel	Natural Gas								
Maximum Fuel Input (per boiler)	0.0086	MMSCF/hr	(Maximum Heat Input)/(Fuel Heat Value)						
Unlimited Annual Operation	8760	hr/yr	Number of hours in a year						
Unlimited Annual Fuel Input (per boiler)	75	MMSCF/yr	(Maximum Fuel Input) * (Unlimited Annual Operation)						
Annual Limit	none								
Fuel Heat Value	1020	btu/scf	AP-42 Section 1.4						
Number of Boilers	4								
Criteria Pollutants									
Pollutant	CAS	Emission Factor	Unlimited Emission Rate (lb/hr-boiler)	Unlimited Emission Rate (tpy per boiler)	Limited Emission Rate (tpy)	Unlimited Emission Rate Four Boilers (tpy)	Limited Emission Rate Four Boilers (tpy)	NOTES	
PM		7.60 lb/MMSCF	0.065	0.29	0.29	1.14	1.14	A	
PM10		7.60 lb/MMSCF	0.065	0.29	0.29	1.14	1.14	A	
PM2.5		7.60 lb/MMSCF	0.065	0.29	0.29	1.14	1.14	A	
SO <sub>2</sub>		0.60 lb/MMSCF	0.005	0.02	0.02	0.09	0.09	A	
NO <sub>x</sub>		100.00 lb/MMSCF	0.857	3.75	3.75	15.02	15.02	B	
VOC		5.50 lb/MMSCF	0.047	0.21	0.21	0.83	0.83	A	
CO		84.00 lb/MMSCF	0.720	3.15	3.15	12.61	12.61	B	
Greenhouse Gas (CO <sub>2</sub> e)			1,031	4,515	4,515	18,062	18,062	G	
CO <sub>2</sub>		120161 lb/MMSCF	1,030	4,511	4,511	18,044	18,044	E	
CH <sub>4</sub>		2.27E+00 lb/MMSCF	1.94E-02	8.51E-02	8.51E-02	3.40E-01	3.40E-01	F	
N <sub>2</sub> O		2.27E-01 lb/MMSCF	1.94E-03	8.51E-03	8.51E-03	3.40E-02	3.40E-02	F	
Organics									
Benzene	71-43-2	2.10E-03 lb/MMSCF	1.80E-05	7.88E-05	7.88E-05	3.15E-04	3.15E-04	C	
Butane	106-97-8	2.10E+00 lb/MMSCF	1.80E-02	7.88E-02	7.88E-02	3.15E-01	3.15E-01	C	
Dichlorobenzene	25321-22-6	1.20E-03 lb/MMSCF	1.03E-05	4.50E-05	4.50E-05	1.80E-04	1.80E-04	C	
Ethane	74-84-0	3.10E+00 lb/MMSCF	2.66E-02	1.16E-01	1.16E-01	4.66E-01	4.66E-01	C	
Formaldehyde	50-00-0	7.50E-02 lb/MMSCF	6.43E-04	2.82E-03	2.82E-03	1.13E-02	1.13E-02	C	
Hexane	110-54-3	1.80E+00 lb/MMSCF	1.54E-02	6.76E-02	6.76E-02	2.70E-01	2.70E-01	C	
Naphthalene	91-20-3	6.10E-04 lb/MMSCF	5.23E-06	2.29E-05	2.29E-05	9.16E-05	9.16E-05	C	
Pentane	109-66-0	2.60E+00 lb/MMSCF	2.23E-02	9.76E-02	9.76E-02	3.90E-01	3.90E-01	C	
Propane	74-98-6	1.60E+00 lb/MMSCF	1.37E-02	6.01E-02	6.01E-02	2.40E-01	2.40E-01	C	
Toluene	108-88-3	3.40E-03 lb/MMSCF	2.91E-05	1.28E-04	1.28E-04	5.11E-04	5.11E-04	C	
Acenaphthene	83-32-9	1.80E-06 lb/MMSCF	1.54E-08	6.76E-08	6.76E-08	2.70E-07	2.70E-07	C	
Acenaphthylene	203-96-8	1.80E-06 lb/MMSCF	1.54E-08	6.76E-08	6.76E-08	2.70E-07	2.70E-07	C	
Anthracene	120-12-7	2.40E-06 lb/MMSCF	2.06E-08	9.01E-08	9.01E-08	3.60E-07	3.60E-07	C	
Benz(a)anthracene	56-55-3	1.80E-06 lb/MMSCF	1.54E-08	6.76E-08	6.76E-08	2.70E-07	2.70E-07	C	
Benzo(a)pyrene	50-32-8	1.20E-06 lb/MMSCF	1.03E-08	4.50E-08	4.50E-08	1.80E-07	1.80E-07	C	
Benzo(b)fluoranthene	205-99-2	1.80E-06 lb/MMSCF	1.54E-08	6.76E-08	6.76E-08	2.70E-07	2.70E-07	C	
Benzo(g,h,i)perylene	191-24-2	1.20E-06 lb/MMSCF	1.03E-08	4.50E-08	4.50E-08	1.80E-07	1.80E-07	C	
Benzo(k)fluoranthene	205-82-3	1.80E-06 lb/MMSCF	1.54E-08	6.76E-08	6.76E-08	2.70E-07	2.70E-07	C	
Chrysene	218-01-9	1.80E-06 lb/MMSCF	1.54E-08	6.76E-08	6.76E-08	2.70E-07	2.70E-07	C	
Dibenzo(a,h)anthracene	53-70-3	1.20E-06 lb/MMSCF	1.03E-08	4.50E-08	4.50E-08	1.80E-07	1.80E-07	C	
7,12-Dimethylbenz(a)anthracene	57-97-6	1.60E-05 lb/MMSCF	1.37E-07	6.01E-07	6.01E-07	2.40E-06	2.40E-06	C	
Fluoranthene	206-44-0	3.00E-06 lb/MMSCF	2.57E-08	1.13E-07	1.13E-07	4.50E-07	4.50E-07	C	
Fluorene	86-73-7	2.80E-06 lb/MMSCF	2.40E-08	1.05E-07	1.05E-07	4.20E-07	4.20E-07	C	
Indeno(1,2,3-cd)pyrene	193-39-5	1.80E-06 lb/MMSCF	1.54E-08	6.76E-08	6.76E-08	2.70E-07	2.70E-07	C	
2-Methylnaphthalene	91-57-6	2.40E-05 lb/MMSCF	2.06E-07	9.01E-07	9.01E-07	3.60E-06	3.60E-06	C	
3-Methylchloranthrene	56-49-5	1.80E-06 lb/MMSCF	1.54E-08	6.76E-08	6.76E-08	2.70E-07	2.70E-07	C	
Phenanthrene	85-01-8	1.70E-05 lb/MMSCF	1.46E-07	6.38E-07	6.38E-07	2.55E-06	2.55E-06	C	
Pyrene	129-00-0	5.00E-05 lb/MMSCF	4.29E-07	1.88E-06	1.88E-06	7.51E-06	7.51E-06	C	
Polycyclic Organic Matter (POM)				5.00E-06	5.00E-06	2.00E-05	2.00E-05		
Metals									
Arsenic	7440-38-2	2.00E-04 lb/MMSCF	1.71E-06	7.51E-06	7.51E-06	3.00E-05	3.00E-05	D	
Barium	7440-39-3	4.40E-03 lb/MMSCF	3.77E-05	1.65E-04	1.65E-04	6.61E-04	6.61E-04	D	
Beryllium	7440-41-7	1.20E-05 lb/MMSCF	1.03E-07	4.50E-07	4.50E-07	1.80E-06	1.80E-06	D	
Cadmium	7440-43-9	1.10E-03 lb/MMSCF	9.43E-06	4.13E-05	4.13E-05	1.65E-04	1.65E-04	D	
Chromium	7440-47-3	1.40E-03 lb/MMSCF	1.20E-05	5.26E-05	5.26E-05	2.10E-04	2.10E-04	D	
Cobalt	7440-48-4	8.40E-05 lb/MMSCF	7.20E-07	3.15E-06	3.15E-06	1.26E-05	1.26E-05	D	
Copper	7440-50-8	8.50E-04 lb/MMSCF	7.29E-06	3.19E-05	3.19E-05	1.28E-04	1.28E-04	D	
Lead	7139-92-1	5.00E-04 lb/MMSCF	4.29E-06	1.88E-05	1.88E-05	7.51E-05	7.51E-05	D	
Manganese	7439-96-5	3.80E-04 lb/MMSCF	3.26E-06	1.43E-05	1.43E-05	5.71E-05	5.71E-05	D	
Mercury	7439-97-6	2.60E-04 lb/MMSCF	2.23E-06	9.76E-06	9.76E-06	3.90E-05	3.90E-05	D	
Molybdenum	7439-98-7	1.10E-03 lb/MMSCF	9.43E-06	4.13E-05	4.13E-05	1.65E-04	1.65E-04	D	
Nickel	7440-02-0	2.10E-03 lb/MMSCF	1.80E-05	7.88E-05	7.88E-05	3.15E-04	3.15E-04	D	
Selenium	7782-49-2	2.40E-05 lb/MMSCF	2.06E-07	9.01E-07	9.01E-07	3.60E-06	3.60E-06	D	
Vanadium	7440-62-2	2.30E-03 lb/MMSCF	1.97E-05	8.63E-05	8.63E-05	3.45E-04	3.45E-04	D	
Zinc	7440-66-6	2.90E-02 lb/MMSCF	2.49E-04	1.09E-03	1.09E-03	4.35E-03	4.35E-03	D	
Max HAP				6.76E-02	6.76E-02	2.70E-01	2.70E-01		
Total HAP				7.09E-02	7.09E-02	2.84E-01	2.84E-01		

## NOTES

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AP-42 Table 1.4-2

AP-42 Table 1.4-1

AP-42 Table 1.4-3

AP-42 Table 1.4-4

40 CFR Part 98 Table C-1: Pipeline natural gas = 1028 btu/scf, CO<sub>2</sub> emission = 53.02 kg CO<sub>2</sub>/mmBtu = 120162 lb/MMscf40 CFR Part 98 Table C-2: Pipeline natural gas = 1028 btu/scf, CH<sub>4</sub> = 0.001 kg CH<sub>4</sub>/mmBtu, N<sub>2</sub>O = 0.0001 kg N<sub>2</sub>O / mmBtuCO<sub>2</sub>e = (Global Warming Potential, GWP) \* (Emission). GWP from 40 CFR Part 98 Table A-1. CO<sub>2</sub> = 1, CH<sub>4</sub> = 21, N<sub>2</sub>O = 310

TABLE A19 : EU11-14 EMISSION CALCULATIONS (FUEL OIL)

TABLE A19 : EU11-14 EMISSION CALCULATIONS (FUEL OIL)									
Parameter	Value	Units		Source					
Emission Unit	EU011 - 014			MPCA Emission Unit ID					
Make	Cleaver Brooks			State operating permit application, November 1995					
Model	FLX-900			State operating permit application, November 1995					
Maximum Heat Input (per boiler)	8,742	MMBtu/hr		State operating permit application, November 1995					
Fuel	Fuel Oil								
Maximum Fuel Input (per boiler)	64.0	gal/hr		(Maximum Heat Input)/(Fuel Heat Value)					
Unlimited Annual Operation	8760	hr/yr		Number of hours in a year					
Unlimited Annual Fuel Input (per boiler)	560,640	gal/yr		(Maximum Fuel Input) * (Unlimited Annual Operation)					
Annual Limit	137,000	gal/yr		Permit limit for EU011-014					
Fuel Heat Value	0.14	MMBtu/gal		AP-42 Section 1.4					
Number of Boilers	4								
Criteria Pollutants									
Pollutant	CAS	Emission Factor		Unlimited Emission Rate (lb/hr-boiler)	Unlimited Emission Rate (tpy per boiler)	Limited Emission Rate (tpy)	Unlimited Emission Rate Four Boilers (tpy)	Limited Emission Rate Four Boilers (tpy)	NOTES
PM		3.30	lb/1000 gal	0.211	0.93	0.23	3.70	0.23	A
PM10		2.30	lb/1000 gal	0.147	0.64	0.16	2.58	0.16	B
PM2.5		1.55	lb/1000 gal	0.099	0.43	0.11	1.74	0.11	B
SO2		0.21	lb/1000 gal	0.014	0.06	0.01	0.24	0.01	A, C
NOx		20.00	lb/1000 gal	1.280	5.61	1.37	22.43	1.37	A
VOC		0.56	lb/1000 gal	0.036	0.16	0.04	0.62	0.04	A
CO		5.00	lb/1000 gal	0.320	1.40	0.34	5.61	0.34	A
Greenhouse Gas (CO2e)				1,445	6,329	1,547	25,315	1,547	J
CO2		22501	lb/1000 gal	1,440	6,308	1,541	25,230	1,541	H
CH4		9.13E-01	lb/1000 gal	0	2.56E-01	6.25E-02	1.02E+00	6.25E-02	I
N2O		1.83E-01	lb/1000 gal	0	5.12E-02	1.25E-02	2.05E-01	1.25E-02	I
Organics									
Benzene	71-43-2	2.14E-04	lb/1000 gal	1.37E-05	6.00E-05	1.47E-05	2.40E-04	1.47E-05	D
Ethylbenzene	100-41-4	6.36E-05	lb/1000 gal	4.07E-06	1.78E-05	4.36E-06	7.13E-05	4.36E-06	D
Formaldehyde	50-00-0	3.30E-02	lb/1000 gal	2.11E-03	9.25E-03	2.26E-03	3.70E-02	2.26E-03	D
Naphthalene	91-20-3	1.13E-03	lb/1000 gal	7.23E-05	3.17E-04	7.74E-05	1.27E-03	7.74E-05	D
1,1,1-Trichloroethane	71-55-6	2.36E-04	lb/1000 gal	1.51E-05	6.62E-05	1.62E-05	2.65E-04	1.62E-05	D
Toluene	108-88-3	6.20E-03	lb/1000 gal	3.97E-04	1.74E-03	4.25E-04	6.95E-03	4.25E-04	D
Xylene (o,m,p)	1332-20-7	1.09E-04	lb/1000 gal	6.98E-06	3.06E-05	7.47E-06	1.22E-04	7.47E-06	D
Acenaphthene	83-32-9	2.11E-05	lb/1000 gal	1.35E-06	5.91E-06	1.45E-06	2.37E-05	1.45E-06	D, F
Acenaphthylene	203-96-8	2.53E-07	lb/1000 gal	1.62E-08	7.09E-08	1.73E-08	2.84E-07	1.73E-08	D, F
Anthracene	120-12-7	1.22E-06	lb/1000 gal	7.81E-08	3.42E-07	8.36E-08	1.37E-06	8.36E-08	D, F
Benz(a)anthracene	56-55-3	4.01E-06	lb/1000 gal	2.57E-07	1.12E-06	2.75E-07	4.50E-06	2.75E-07	D, F
Benzo(b,k)fluoranthene	205-99-2	1.48E-06	lb/1000 gal	9.47E-08	4.15E-07	1.01E-07	1.66E-06	1.01E-07	D, F
Benzo(g,h,i)perylene	191-24-2	2.26E-06	lb/1000 gal	1.45E-07	6.34E-07	1.55E-07	2.53E-06	1.55E-07	D, F
Chrysene	218-01-9	2.38E-06	lb/1000 gal	1.52E-07	6.67E-07	1.63E-07	2.67E-06	1.63E-07	D, F
Dibenzo(a,h)anthracene	53-70-3	1.67E-06	lb/1000 gal	1.07E-07	4.68E-07	1.14E-07	1.87E-06	1.14E-07	D, F
Fluoranthene	206-44-0	4.84E-06	lb/1000 gal	3.10E-07	1.36E-06	3.32E-07	5.43E-06	3.32E-07	D, F
Fluorene	86-73-7	4.47E-06	lb/1000 gal	2.86E-07	1.25E-06	3.06E-07	5.01E-06	3.06E-07	D, F
Indeno(1,2,3-cd)pyrene	193-39-5	2.14E-06	lb/1000 gal	1.37E-07	6.00E-07	1.47E-07	2.40E-06	1.47E-07	D, F
Phenanthrene	85-01-8	1.05E-05	lb/1000 gal	6.72E-07	2.94E-06	7.19E-07	1.18E-05	7.19E-07	D, F
Pyrene	129-00-0	4.25E-06	lb/1000 gal	2.72E-07	1.19E-06	2.91E-07	4.77E-06	2.91E-07	D, F
OCDD	3268-87-9	3.10E-09	lb/1000 gal	1.98E-10	8.69E-10	2.12E-10	3.48E-09	2.12E-10	D, F
Polycyclic Organic Matter (POM)					1.70E-05	4.15E-06	6.79E-05	4.15E-06	
Metals									
Arsenic	7440-38-2	5.60E-04	lb/1000 gal	3.58E-05	1.57E-04	3.84E-05	6.28E-04	3.84E-05	E
Beryllium	7440-41-7	4.20E-04	lb/1000 gal	2.69E-05	1.18E-04	2.88E-05	4.71E-04	2.88E-05	E
Cadmium	7440-43-9	4.20E-04	lb/1000 gal	2.69E-05	1.18E-04	2.88E-05	4.71E-04	2.88E-05	E
Chromium	7440-47-3	4.20E-04	lb/1000 gal	2.69E-05	1.18E-04	2.88E-05	4.71E-04	2.88E-05	E
Copper	7440-50-8	8.40E-04	lb/1000 gal	5.38E-05	2.35E-04	5.75E-05	9.42E-04	5.75E-05	E
Lead	7139-92-1	1.26E-03	lb/1000 gal	8.06E-05	3.53E-04	8.63E-05	1.41E-03	8.63E-05	E
Manganese	7439-96-5	8.40E-04	lb/1000 gal	5.38E-05	2.35E-04	5.75E-05	9.42E-04	5.75E-05	E
Mercury	7439-97-6	4.20E-04	lb/1000 gal	2.69E-05	1.18E-04	2.88E-05	4.71E-04	2.88E-05	E
Nickel	7440-02-0	4.20E-04	lb/1000 gal	2.69E-05	1.18E-04	2.88E-05	4.71E-04	2.88E-05	E
Selenium	7782-49-2	2.10E-03	lb/1000 gal	1.34E-04	5.89E-04	1.44E-04	2.35E-03	1.44E-04	E
Zinc	7440-66-6	5.60E-04	lb/1000 gal	3.58E-05	1.57E-04	3.84E-05	6.28E-04	3.84E-05	E
Max HAP					9.25E-03	2.26E-03	3.70E-02	9.04E-03	
Total HAP					1.34E-02	3.28E-03	5.37E-02	1.31E-02	

## NOTES

- A AP-42 Table 1.3-1, 9/98  
 B AP-42 Table 1.3-6, 9/98  
 C Sulfur Content= 0.0015 % wt  
 D AP-42 Table 1.3-9, 9/98  
 E AP-42 Table 1.3-11, 9/98  
 F This compound is considered polycyclic organic matter (POM)  
 G AP-42 Table 1.3-12, 9/98  
 H 40 CFR Part 98 Table C-1: Pipeline natural gas = 0.138 btu/gal, CO<sub>2</sub> emission = 73.96 kg CO<sub>2</sub>/mmBtu = 22,501 lb/1000 gal  
 I 40 CFR Part 98 Table C-2: Pipeline natural gas = 0.138 btu/gal, CH<sub>4</sub> = 0.003 kg CH<sub>4</sub>/mmBtu, N<sub>2</sub>O = 0.0006 kg N<sub>2</sub>O / mmBtu  
 J CO<sub>2</sub>e = (Global Warming Potential, GWP) \* (Emission). GWP from 40 CFR Part 98 Table A-1. CO<sub>2</sub> = 1, CH<sub>4</sub> = 21, N<sub>2</sub>O = 310

GP003 EMISSION CALCULATION SUMMARY					
Parameter	Value	Units	Source		
Emission Unit	GP003		MPCA Emission Unit ID		
Annual Operating Limit	137,000	gal/yr	Fuel Oil (no limit on natural gas)		
Hours of operation to reach Fuel Oil Limit	2141	hours	Hours for one boiler to reach annual fuel oil limit.		
Capacity factor for NG Emissions	0.939		1 - (Capacity factor for FO Emissions)		
Capacity factor for FO Emissions	0.061		(2141 hrs) / 4 /8760. This is the annual capacity factor if all four boilers operate on fuel oil assuming simultaneous operation at full load to reach the annual fuel oil limit. This factor is multiplied by the unlimited emissions to obtain the emissions from GP003 on fuel oil.		
Criteria Pollutants					
Pollutant	CAS	EU011-014 Limited Emissions from Natural Gas Combustion (tpy)	EU011-014 Limited Emissions from Fuel Oil Combustion (tpy)	GP003 Limited Emissions (tpy)	NOTES
PM		1.07	0.23	1.30	A
PM10		1.07	0.16	1.23	B
PM2.5		1.07	0.11	1.18	B
SO2		0.08	0.01	0.10	A
NOx		14.10	1.37	15.47	A
VOC		0.78	0.04	0.83	B
CO		11.84	0.34	12.61	B
Greenhouse Gas (CO2e)		16,958	1,547	18,505	A
CO2		16941	1541	18483	A
CH4		3.20E-01	6.25E-02	3.82E-01	A
N2O		3.20E-02	1.25E-02	4.45E-02	A
Organics					
Benzene	71-43-2	2.96E-04	1.47E-05	3.15E-04	
Butane	106-97-8	2.96E-01	0.00E+00	3.15E-01	
Dichlorobenzene	25321-22-6	1.69E-04	0.00E+00	1.80E-04	
Ethylbenzene	100-41-4	0.00E+00	4.36E-06	4.36E-06	
Ethane	74-84-0	4.37E-01	0.00E+00	4.66E-01	
Formaldehyde	50-00-0	1.06E-02	2.26E-03	1.28E-02	
Hexane	110-54-3	2.54E-01	0.00E+00	2.70E-01	
Naphthalene	91-20-3	8.60E-05	7.74E-05	1.63E-04	
Pentane	109-66-0	3.67E-01	0.00E+00	3.90E-01	
Propane	74-98-6	2.26E-01	0.00E+00	2.40E-01	
1,1,1-Trichloroethane	71-55-6	0.00E+00	1.62E-05	1.62E-05	
Toluene	108-88-3	4.79E-04	4.25E-04	9.04E-04	
Xylene (o,m,p)	1332-20-7	0.00E+00	7.47E-06	7.47E-06	
Acenaphthene	83-32-9	2.54E-07	1.45E-06	1.70E-06	
Acenaphthylene	203-96-8	2.54E-07	1.73E-08	2.71E-07	
Anthracene	120-12-7	3.38E-07	8.36E-08	4.22E-07	
Benz(a)anthracene	56-55-3	2.54E-07	2.75E-07	5.28E-07	
Benzo(a)pyrene	50-32-8	1.69E-07	0.00E+00	1.80E-07	
Benzo(b)fluoranthene	205-99-2	2.54E-07	0.00E+00	2.70E-07	
Benzo(b,k)fluoranthene	205-99-2	0.00E+00	1.01E-07	1.01E-07	
Benzo(g,h,i)perylene	191-24-2	1.69E-07	1.55E-07	3.24E-07	
Benzo(k)fluoranthene	205-82-3	2.54E-07	0.00E+00	2.70E-07	
Chrysene	218-01-9	2.54E-07	1.63E-07	4.17E-07	
Dibenzo(a,h)anthracene	53-70-3	1.69E-07	1.14E-07	2.84E-07	
7,12-Dimethylbenz(a)anthracene	57-97-6	2.26E-06	0.00E+00	2.40E-06	
Fluoranthene	206-44-0	4.23E-07	3.32E-07	7.55E-07	
Fluorene	86-73-7	3.95E-07	3.06E-07	7.01E-07	
Indeno(1,2,3-cd)pyrene	193-39-5	2.54E-07	1.47E-07	4.00E-07	
2-Methylnaphthalene	91-57-6	3.38E-06	0.00E+00	3.60E-06	
3-Methylchloranthrene	56-49-5	2.54E-07	0.00E+00	2.70E-07	
Phenanthrene	85-01-8	2.40E-06	7.19E-07	3.12E-06	
Pyrene	129-00-0	7.05E-06	2.91E-07	7.51E-06	
OCDD	3268-87-9	0.00E+00	2.12E-10	2.12E-10	
Polycyclic Organic Matter (POM)		1.88E-05	4.15E-06	2.29E-05	
Metals					
Antimony	7440-36-0	0.00E+00	0.00E+00	0.00E+00	
Arsenic	7440-38-2	2.82E-05	3.84E-05	6.66E-05	
Barium	7440-39-3	6.20E-04	0.00E+00	6.61E-04	
Beryllium	7440-41-7	1.69E-06	2.88E-05	3.05E-05	
Cadmium	7440-43-9	1.55E-04	2.88E-05	1.84E-04	
Chloride		0.00E+00	0.00E+00	0.00E+00	
Chromium	7440-47-3	1.97E-04	2.88E-05	2.26E-04	
Chromium (VI)	18540-29-9	0.00E+00	0.00E+00	0.00E+00	
Cobalt	7440-48-4	1.18E-05	0.00E+00	1.26E-05	
Copper	7440-50-8	1.20E-04	5.75E-05	1.77E-04	
Fluoride	16984-48-8	0.00E+00	0.00E+00	0.00E+00	
Lead	7139-92-1	7.05E-05	8.63E-05	1.57E-04	
Manganese	7439-96-5	5.36E-05	5.75E-05	1.11E-04	
Mercury	7439-97-6	3.67E-05	2.88E-05	6.54E-05	
Molybdenum	7439-98-7	1.55E-04	0.00E+00	1.65E-04	
Nickel	7440-02-0	2.96E-04	2.88E-05	3.25E-04	
Phosphorus	7723-14-0	0.00E+00	0.00E+00	0.00E+00	
Selenium	7782-49-2	3.38E-06	1.44E-04	1.47E-04	
Vanadium	7440-62-2	3.24E-04	0.00E+00	3.45E-04	
Zinc	7440-66-6	4.09E-03	3.84E-05	4.35E-03	
Max HAP		2.54E-01	0.0022605	2.70E-01	
Total HAP		2.66E-01	0.003279313	2.84E-01	

## NOTES

A Worst case emissions occur from combustion of fuel oil up to permit limit, then combusting natural gas the remainder of the year.

B Worst case emissions occur from combustion of natural gas all year.

Please refer to Tables 18-19 for detailed calculations for each emission unit in GP003.

TABLE A21 : EU15 EMISSION CALCULATIONS (FUEL OIL)							
Parameter	Value	Units	Source				
Emission Unit	EU15		MPCA Emission Unit ID				
Make	Cummins		State operating permit application, November 1995				
Model	QST30-G1		State operating permit application, November 1995				
Maximum Output	1135	bhp	State operating permit application, November 1995				
Fuel	No 2 Fuel Oil						
Maximum Fuel Input	44.50	gal/hr					
Unlimited Annual Operation	500	hr/yr					
Unlimited Annual Fuel Input	22,250	gal/yr	(Maximum Fuel Input) * (Unlimited Annual Operation)				
Annual Limit	300	hr/yr	Permit Limit				
Fuel Heat Value	0.14	MMBtu/gal	AP-42 Section 1.3				
Maximum Heat Input	6.23	MMBtu/hr	(Maximum Fuel Input) * (Fuel Heat Value)				
Criteria Pollutants							
Pollutant	CAS	Emission Factor		Unlimited Emission Rate (lb/hr)	Unlimited Emission Rate (tpy)	Limited Emission Rate (tpy)	NOTES
PM		0.0697	lb/MMBtu	0.434	0.11	0.07	C
PM10		0.0573	lb/MMBtu	0.357	0.09	0.05	C
PM2.5		0.0556	lb/MMBtu	0.346	0.09	0.05	C
SO2		0.0015	lb/MMBtu	0.009	0.00	0.001	A, B
NOx		3.20	lb/MMBtu	19.936	4.98	2.99	A
VOC		0.09	lb/MMBtu	0.561	0.14	0.08	A
CO		0.85	lb/MMBtu	5.296	1.32	0.79	A
Greenhouse Gas (CO <sub>2</sub> e)		163.60	lb/MMBtu	1,019.235	255	153	G
CO2		163.1	lb/MMBtu	1,015.815	254	152	E
CH <sub>4</sub>		0.007	lb/MMBtu	0.041	0	0	F
N <sub>2</sub> O		0.001	lb/MMBtu	0.008	0	0	F
Organics							
Acetaldehyde	75-07-0	2.52E-05	lb/MMBtu	1.12E-06	2.80E-07	1.68E-07	D
Acrolein	107-02-8	7.88E-06	lb/MMBtu	3.51E-07	8.77E-08	5.26E-08	D
Benzene	71-43-2	7.76E-04	lb/MMBtu	4.83E-03	1.21E-03	7.25E-04	D
Formaldehyde	50-00-0	7.89E-05	lb/MMBtu	4.92E-04	1.23E-04	7.37E-05	D
Naphthalene	91-20-3	1.30E-04	lb/MMBtu	8.10E-04	2.02E-04	1.21E-04	D
Propylene		2.79E-03	lb/MMBtu	1.74E-02	4.35E-03	2.61E-03	D
Toluene	108-88-3	2.81E-04	lb/MMBtu	1.75E-03	4.38E-04	2.63E-04	D
Xylene (o,m,p)	1332-20-7	1.93E-04	lb/MMBtu	1.20E-03	3.01E-04	1.80E-04	D
Acenaphthene	83-32-9	4.68E-06	lb/MMBtu	2.92E-05	7.29E-06	4.37E-06	D
Acenaphthylene	203-96-8	9.23E-06	lb/MMBtu	5.75E-05	1.44E-05	8.63E-06	D
Anthracene	120-12-7	1.23E-06	lb/MMBtu	7.66E-06	1.92E-06	1.15E-06	D
Benz(a)anthracene	56-55-3	6.22E-07	lb/MMBtu	3.88E-06	9.69E-07	5.81E-07	D
Benzo(a)pyrene	50-32-8	2.57E-07	lb/MMBtu	1.60E-06	4.00E-07	2.40E-07	D
Benzo(b)fluoranthene	205-99-2	1.11E-06	lb/MMBtu	6.92E-06	1.73E-06	1.04E-06	D
Benzo(g,h,i)perylene	191-24-2	5.56E-07	lb/MMBtu	3.46E-06	8.66E-07	5.20E-07	D
Benzo(k)fluoranthene	205-82-3	2.18E-07	lb/MMBtu	1.36E-06	3.40E-07	2.04E-07	D
Chrysene	218-01-9	1.53E-06	lb/MMBtu	9.53E-06	2.38E-06	1.43E-06	D
Dibenzo(a,h)anthracene	53-70-3	3.46E-07	lb/MMBtu	2.16E-06	5.39E-07	3.23E-07	D
Fluoranthene	206-44-0	4.03E-06	lb/MMBtu	2.51E-05	6.28E-06	3.77E-06	D
Fluorene	86-73-7	1.28E-05	lb/MMBtu	7.97E-05	1.99E-05	1.20E-05	D
Indeno(1,2,3-cd)pyrene	193-39-5	4.14E-07	lb/MMBtu	2.58E-06	6.45E-07	3.87E-07	D
Phenanthrene	85-01-8	4.08E-05	lb/MMBtu	2.54E-04	6.35E-05	3.81E-05	D
Pyrene	129-00-0	3.71E-06	lb/MMBtu	2.31E-05	5.78E-06	3.47E-06	D
Polycyclic Organic Matter (POM)					1.27E-04	7.62E-05	
Max HAP					1.21E-03	7.25E-04	
Total HAP					2.40E-03	1.44E-03	

## NOTES

- A AP-42 Table 3.4-1
- B Sulfur Content= 0.0015 % wt
- C AP-42 Table 3.4-2
- D AP-42 Table 3.4-3 and 3.4-4
- E 40 CFR Part 98 Table C-1: Pipeline natural gas = 1028 btu/scf, CO<sub>2</sub> emission = 53.02 kg CO<sub>2</sub>/mmBtu = 120162 lb/MMscf
- F 40 CFR Part 98 Table C-2: Pipeline natural gas = 1028 btu/scf, CH<sub>4</sub> = 0.001 kg CH<sub>4</sub>/mmBtu, N<sub>2</sub>O = 0.0001 kg N<sub>2</sub>O / mmBtu
- G CO<sub>2</sub>e = (Global Warming Potential, GWP) \* (Emission). GWP from 40 CFR Part 98 Table A-1. CO<sub>2</sub> = 1, CH<sub>4</sub> = 21, N<sub>2</sub>O = 310

TABLE A22 : EU16 EMISSION CALCULATIONS (FUEL OIL)							
Parameter	Value	Units	Source				
Emission Unit	EU16		MPCA Emission Unit ID				
Make	Cummins		State operating permit application, November 1995				
Model	QST30-G1		State operating permit application, November 1995				
Maximum Output	1135	bhp	State operating permit application, November 1995				
Fuel	No 2 Fuel Oil						
Maximum Fuel Input	44.50	gal/hr					
Unlimited Annual Operation	500	hr/yr					
Unlimited Annual Fuel Input	22,250	gal/yr	(Maximum Fuel Input) * (Unlimited Annual Operation)				
Annual Limit	300	hr/yr	Permit Limit				
Fuel Heat Value	0.14	MMBtu/gal	AP-42 Section 1.3				
Maximum Heat Input	6.23	MMBtu/hr	(Maximum Fuel Input) * (Fuel Heat Value)				
Criteria Pollutants							
Pollutant	CAS	Emission Factor		Unlimited Emission Rate (lb/hr)	Unlimited Emission Rate (tpy)	Limited Emission Rate (tpy)	NOTES
PM		0.0697	lb/MMBtu	0.434	0.11	0.07	C
PM10		0.0573	lb/MMBtu	0.357	0.09	0.05	C
PM2.5		0.0556	lb/MMBtu	0.346	0.09	0.05	C
SO2		0.00	lb/MMBtu	0.009	0.00	0.00	A, B
NOx		3.20	lb/MMBtu	19.936	4.98	2.99	A
VOC		0.09	lb/MMBtu	0.561	0.14	0.08	A
CO		0.85	lb/MMBtu	5.296	1.32	0.79	A
Greenhouse Gas (CO <sub>2</sub> e)		163.60	lb/MMBtu	1,019.235	255	153	G
CO2		163.1	lb/MMBtu	1,015.815	254	152	E
CH <sub>4</sub>		0.007	lb/MMBtu	0.041	0	0	F
N <sub>2</sub> O		0.001	lb/MMBtu	0.008	0	0	F
Organics							
Acetaldehyde	75-07-0	2.52E-05	lb/MMBtu	1.12E-06	2.80E-07	1.68E-07	D
Acrolein	107-02-8	7.88E-06	lb/MMBtu	3.51E-07	8.77E-08	5.26E-08	D
Benzene	71-43-2	7.76E-04	lb/MMBtu	4.83E-03	1.21E-03	7.25E-04	D
Formaldehyde	50-00-0	7.89E-05	lb/MMBtu	4.92E-04	1.23E-04	7.37E-05	D
Naphthalene	91-20-3	1.30E-04	lb/MMBtu	8.10E-04	2.02E-04	1.21E-04	D
Propylene		2.79E-03	lb/MMBtu	1.74E-02	4.35E-03	2.61E-03	D
Toluene	108-88-3	2.81E-04	lb/MMBtu	1.75E-03	4.38E-04	2.63E-04	D
Xylene (o,m,p)	1332-20-7	1.93E-04	lb/MMBtu	1.20E-03	3.01E-04	1.80E-04	D
Acenaphthene	83-32-9	4.68E-06	lb/MMBtu	2.92E-05	7.29E-06	4.37E-06	D
Acenaphthylene	203-96-8	9.23E-06	lb/MMBtu	5.75E-05	1.44E-05	8.63E-06	D
Anthracene	120-12-7	1.23E-06	lb/MMBtu	7.66E-06	1.92E-06	1.15E-06	D
Benz(a)anthracene	56-55-3	6.22E-07	lb/MMBtu	3.88E-06	9.69E-07	5.81E-07	D
Benzo(a)pyrene	50-32-8	2.57E-07	lb/MMBtu	1.60E-06	4.00E-07	2.40E-07	D
Benzo(b)fluoranthene	205-99-2	1.11E-06	lb/MMBtu	6.92E-06	1.73E-06	1.04E-06	D
Benzo(g,h,i)perylene	191-24-2	5.56E-07	lb/MMBtu	3.46E-06	8.66E-07	5.20E-07	D
Benzo(k)fluoranthene	205-82-3	2.18E-07	lb/MMBtu	1.36E-06	3.40E-07	2.04E-07	D
Chrysene	218-01-9	1.53E-06	lb/MMBtu	9.53E-06	2.38E-06	1.43E-06	D
Dibenzo(a,h)anthracene	53-70-3	3.46E-07	lb/MMBtu	2.16E-06	5.39E-07	3.23E-07	D
Fluoranthene	206-44-0	4.03E-06	lb/MMBtu	2.51E-05	6.28E-06	3.77E-06	D
Fluorene	86-73-7	1.28E-05	lb/MMBtu	7.97E-05	1.99E-05	1.20E-05	D
Indeno(1,2,3-cd)pyrene	193-39-5	4.14E-07	lb/MMBtu	2.58E-06	6.45E-07	3.87E-07	D
Phenanthrene	85-01-8	4.08E-05	lb/MMBtu	2.54E-04	6.35E-05	3.81E-05	D
Pyrene	129-00-0	3.71E-06	lb/MMBtu	2.31E-05	5.78E-06	3.47E-06	D
Polycyclic Organic Matter (POM)					1.27E-04	7.62E-05	
Max HAP					1.21E-03	7.25E-04	
Total HAP					2.40E-03	1.44E-03	

## NOTES

- A AP-42 Table 3.4-1
- B Sulfur Content= 0.0015 % wt
- C AP-42 Table 3.4-2
- D AP-42 Table 3.4-3 and 3.4-4
- E 40 CFR Part 98 Table C-1: Pipeline natural gas = 1028 btu/scf, CO<sub>2</sub> emission = 53.02 kg CO<sub>2</sub>/mmBtu = 120162 lb/MMscf
- F 40 CFR Part 98 Table C-2: Pipeline natural gas = 1028 btu/scf, CH<sub>4</sub> = 0.001 kg CH<sub>4</sub>/mmBtu, N<sub>2</sub>O = 0.0001 kg N<sub>2</sub>O / mmBtu
- G CO<sub>2</sub>e = (Global Warming Potential, GWP) \* (Emission). GWP from 40 CFR Part 98 Table A-1. CO<sub>2</sub> = 1, CH<sub>4</sub> = 21, N<sub>2</sub>O = 310

TABLE A23 : EU17 EMISSION CALCULATIONS (FUEL OIL)							
Parameter	Value	Units	Source				
Emission Unit	EU17		MPCA Emission Unit ID				
Make	Cummins		State operating permit application, November 1995				
Model	QST30-G1		State operating permit application, November 1995				
Maximum Output	1135	bhp	State operating permit application, November 1995				
Fuel	No 2 Fuel Oil						
Maximum Fuel Input	44.50	gal/hr					
Unlimited Annual Operation	500	hr/yr					
Unlimited Annual Fuel Input	22,250	gal/yr	(Maximum Fuel Input) * (Unlimited Annual Operation)				
Annual Limit	300	hr/yr	Permit Limit				
Fuel Heat Value	0.14	MMBtu/gal	AP-42 Section 1.3				
Maximum Heat Input	6.23	MMBtu/hr	(Maximum Fuel Input) * (Fuel Heat Value)				
Criteria Pollutants							
Pollutant	CAS	Emission Factor		Unlimited Emission Rate (lb/hr)	Unlimited Emission Rate (tpy)	Limited Emission Rate (tpy)	NOTES
PM		0.0697	lb/MMBtu	0.434	0.11	0.07	C
PM10		0.0573	lb/MMBtu	0.357	0.09	0.05	C
PM2.5		0.0556	lb/MMBtu	0.346	0.09	0.05	C
SO2		0.00	lb/MMBtu	0.009	0.00	0.00	A, B
NOx		3.20	lb/MMBtu	19.936	4.98	2.99	A
VOC		0.09	lb/MMBtu	0.561	0.14	0.08	A
CO		0.85	lb/MMBtu	5.296	1.32	0.79	A
Greenhouse Gas (CO2e)		163.60	lb/MMBtu	1,019.235	255	153	G
CO2		163.1	lb/MMBtu	1,015.815	254	152	E
CH4		0.007	lb/MMBtu	0.041	0	0	F
N2O		0.001	lb/MMBtu	0.008	0	0	F
Organics							
Acetaldehyde	75-07-0	2.52E-05	lb/MMBtu	1.12E-06	2.80E-07	1.68E-07	D
Acrolein	107-02-8	7.88E-06	lb/MMBtu	3.51E-07	8.77E-08	5.26E-08	D
Benzene	71-43-2	7.76E-04	lb/MMBtu	4.83E-03	1.21E-03	7.25E-04	D
Formaldehyde	50-00-0	7.89E-05	lb/MMBtu	4.92E-04	1.23E-04	7.37E-05	D
Naphthalene	91-20-3	1.30E-04	lb/MMBtu	8.10E-04	2.02E-04	1.21E-04	D
Propylene		2.79E-03	lb/MMBtu	1.74E-02	4.35E-03	2.61E-03	D
Toluene	108-88-3	2.81E-04	lb/MMBtu	1.75E-03	4.38E-04	2.63E-04	D
Xylene (o,m,p)	1332-20-7	1.93E-04	lb/MMBtu	1.20E-03	3.01E-04	1.80E-04	D
Acenaphthene	83-32-9	4.68E-06	lb/MMBtu	2.92E-05	7.29E-06	4.37E-06	D
Acenaphthylene	203-96-8	9.23E-06	lb/MMBtu	5.75E-05	1.44E-05	8.63E-06	D
Anthracene	120-12-7	1.23E-06	lb/MMBtu	7.66E-06	1.92E-06	1.15E-06	D
Benz(a)anthracene	56-55-3	6.22E-07	lb/MMBtu	3.88E-06	9.69E-07	5.81E-07	D
Benzo(a)pyrene	50-32-8	2.57E-07	lb/MMBtu	1.60E-06	4.00E-07	2.40E-07	D
Benzo(b)fluoranthene	205-99-2	1.11E-06	lb/MMBtu	6.92E-06	1.73E-06	1.04E-06	D
Benzo(g,h,i)perylene	191-24-2	5.56E-07	lb/MMBtu	3.46E-06	8.66E-07	5.20E-07	D
Benzo(k)fluoranthene	205-82-3	2.18E-07	lb/MMBtu	1.36E-06	3.40E-07	2.04E-07	D
Chrysene	218-01-9	1.53E-06	lb/MMBtu	9.53E-06	2.38E-06	1.43E-06	D
Dibenzo(a,h)anthracene	53-70-3	3.46E-07	lb/MMBtu	2.16E-06	5.39E-07	3.23E-07	D
Fluoranthene	206-44-0	4.03E-06	lb/MMBtu	2.51E-05	6.28E-06	3.77E-06	D
Fluorene	86-73-7	1.28E-05	lb/MMBtu	7.97E-05	1.99E-05	1.20E-05	D
Indeno(1,2,3-cd)pyrene	193-39-5	4.14E-07	lb/MMBtu	2.58E-06	6.45E-07	3.87E-07	D
Phenanthrene	85-01-8	4.08E-05	lb/MMBtu	2.54E-04	6.35E-05	3.81E-05	D
Pyrene	129-00-0	3.71E-06	lb/MMBtu	2.31E-05	5.78E-06	3.47E-06	D
Polycyclic Organic Matter (POM)					1.27E-04	7.62E-05	
Max HAP					1.21E-03	7.25E-04	
Total HAP					2.40E-03	1.44E-03	

## NOTES

- A AP-42 Table 3.4-1
- B Sulfur Content= 0.0015 % wt
- C AP-42 Table 3.4-2
- D AP-42 Table 3.4-3 and 3.4-4
- E 40 CFR Part 98 Table C-1: Pipeline natural gas = 1028 btu/scf, CO<sub>2</sub> emission = 53.02 kg CO<sub>2</sub>/mmBtu = 120162 lb/MMscf
- F 40 CFR Part 98 Table C-2: Pipeline natural gas = 1028 btu/scf, CH<sub>4</sub> = 0.001 kg CH<sub>4</sub>/mmBtu, N<sub>2</sub>O = 0.0001 kg N<sub>2</sub>O / mmBtu
- G CO<sub>2</sub>e = (Global Warming Potential, GWP) \* (Emission). GWP from 40 CFR Part 98 Table A-1. CO<sub>2</sub> = 1, CH<sub>4</sub> = 21, N<sub>2</sub>O = 310



TABLE A24 : EU18 EMISSION CALCULATIONS (FUEL OIL)							
Parameter	Value	Units	Source				
Emission Unit	EU18		MPCA Emission Unit ID				
Make	Caterpillar		State operating permit application, November 1995				
Model	3306B		State operating permit application, November 1995				
Maximum Output	382	bhp	State operating permit application, November 1995				
Fuel	No 2 Fuel Oil						
Maximum Fuel Input	14.98	gal/hr					
Unlimited Annual Operation	500	hr/yr	Unlimited Operation for an emergency generator = 500 hours/yr				
Unlimited Annual Fuel Input	7,489	gal/yr	(Maximum Fuel Input) * (Unlimited Annual Operation)				
Annual Limit	300	hr/yr	Permit Limit				
Fuel Heat Value	0.14	MMBtu/gal	AP-42 Section 1.3				
Maximum Heat Input	2.10	MMBtu/hr	(Maximum Fuel Input) * (Fuel Heat Value)				
Criteria Pollutants							
Pollutant	CAS	Emission Factor		Unlimited Emission Rate (lb/hr)	Unlimited Emission Rate (tpy)	Limited Emission Rate (tpy)	NOTES
PM		0.3100	lb/MMBtu	0.650	0.16	0.10	C
PM10		0.3100	lb/MMBtu	0.650	0.16	0.10	C
PM2.5		0.3100	lb/MMBtu	0.650	0.16	0.10	C
SO2		0.002	lb/MMBtu	0.003	0.00	0.00	A, B
NOx		4.41	lb/MMBtu	9.247	2.31	1.39	C
VOC		0.35	lb/MMBtu	0.734	0.18	0.11	C
CO		0.95	lb/MMBtu	1.992	0.50	0.30	C
Greenhouse Gas (CO2e)		163.60	lb/MMBtu	343.038	86	51	G
CO2		163.1	lb/MMBtu	341.887	85	51	E
CH4		0.007	lb/MMBtu	0.014	0	0	F
N2O		0.001	lb/MMBtu	0.003	0	0	F
Organics							
Acetaldehyde	75-07-0	2.52E-05	lb/MMBtu	3.77E-07	9.44E-08	5.66E-08	D
Acrolein	107-02-8	7.88E-06	lb/MMBtu	1.18E-07	2.95E-08	1.77E-08	D
Benzene	71-43-2	7.76E-04	lb/MMBtu	1.63E-03	4.07E-04	2.44E-04	D
Formaldehyde	50-00-0	7.89E-05	lb/MMBtu	1.65E-04	4.14E-05	2.48E-05	D
Naphthalene	91-20-3	1.30E-04	lb/MMBtu	2.73E-04	6.81E-05	4.09E-05	D
Propylene		2.79E-03	lb/MMBtu	5.85E-03	1.46E-03	8.78E-04	D
Toluene	108-88-3	2.81E-04	lb/MMBtu	5.89E-04	1.47E-04	8.84E-05	D
Xylene (o,m,p)	1332-20-7	1.93E-04	lb/MMBtu	4.05E-04	1.01E-04	6.07E-05	D
Acenaphthene	83-32-9	4.68E-06	lb/MMBtu	9.81E-06	2.45E-06	1.47E-06	D
Acenaphthylene	203-96-8	9.23E-06	lb/MMBtu	1.94E-05	4.84E-06	2.90E-06	D
Anthracene	120-12-7	1.23E-06	lb/MMBtu	2.58E-06	6.45E-07	3.87E-07	D
Benz(a)anthracene	56-55-3	6.22E-07	lb/MMBtu	1.30E-06	3.26E-07	1.96E-07	D
Benzo(a)pyrene	50-32-8	2.57E-07	lb/MMBtu	5.39E-07	1.35E-07	8.08E-08	D
Benzo(b)fluoranthene	205-99-2	1.11E-06	lb/MMBtu	2.33E-06	5.82E-07	3.49E-07	D
Benzo(g,h,i)perylene	191-24-2	5.56E-07	lb/MMBtu	1.17E-06	2.91E-07	1.75E-07	D
Benzo(k)fluoranthene	205-82-3	2.18E-07	lb/MMBtu	4.57E-07	1.14E-07	6.86E-08	D
Chrysene	218-01-9	1.53E-06	lb/MMBtu	3.21E-06	8.02E-07	4.81E-07	D
Dibenzo(a,h)anthracene	53-70-3	3.46E-07	lb/MMBtu	7.25E-07	1.81E-07	1.09E-07	D
Fluoranthene	206-44-0	4.03E-06	lb/MMBtu	8.45E-06	2.11E-06	1.27E-06	D
Fluorene	86-73-7	1.28E-05	lb/MMBtu	2.68E-05	6.71E-06	4.03E-06	D
Indeno(1,2,3-cd)pyrene	193-39-5	4.14E-07	lb/MMBtu	8.68E-07	2.17E-07	1.30E-07	D
Phenanthrene	85-01-8	4.08E-05	lb/MMBtu	8.55E-05	2.14E-05	1.28E-05	D
Pyrene	129-00-0	3.71E-06	lb/MMBtu	7.78E-06	1.94E-06	1.17E-06	D
Polycyclic Organic Matter (POM)					4.27E-05	2.56E-05	
Max HAP					4.07E-04	2.44E-04	
Total HAP					8.07E-04	4.85E-04	

## NOTES

- A AP-42 Table 3.4-1
- B Sulfur Content= 0.0015 % wt
- C AP-42 Table 3.3-1
- D AP-42 Table 3.4-3 and 3.4-4
- E 40 CFR Part 98 Table C-1
- F 40 CFR Part 98 Table C-2
- G CO<sub>2</sub>e = (Global Warming Potential, GWP) \* (Emission). GWP from 40 CFR Part 98 Table A-1. CO<sub>2</sub> = 1, CH<sub>4</sub> = 21, N<sub>2</sub>O = 310



TABLE A25 : GP004 EMISSION CALCULATION SUMMARY						
Parameter	Value	Units	Source			
Emission Unit	GP004		MPCA Emission Unit ID			
Annual Operating Limit	300	hr/yr	Each Generator in GP004			
Criteria Pollutants						
Pollutant	CAS	EU015 Limited Emissions (tpy)	EU016 Limited Emissions (tpy)	EU017 Limited Emissions (tpy)	EU018 Limited Emissions (tpy)	GP004 Limited Emissions (tpy)
PM		0.07	0.07	0.07	0.10	0.29
PM10		0.05	0.05	0.05	0.10	0.26
PM2.5		0.05	0.05	0.05	0.10	0.25
SO2		0.00	0.00	0.00	0.00	0.00
NOx		2.99	2.99	2.99	1.39	10.36
VOC		0.08	0.08	0.08	0.11	0.36
CO		0.79	0.79	0.79	0.30	2.68
Greenhouse Gas (CO <sub>2</sub> e)		153	153	153	51	510
CO <sub>2</sub>		152	152	152	51	508
CH <sub>4</sub>		0.006	0.006	0.006	0.002	0.021
N <sub>2</sub> O		0.001	0.001	0.001	0.000	0.004
Organics						
Acetaldehyde	75-07-0	1.68E-07	1.68E-07	1.68E-07	5.66E-08	5.61E-07
Acrolein	107-02-8	5.26E-08	5.26E-08	5.26E-08	1.77E-08	1.75E-07
Benzene	71-43-2	7.25E-04	7.25E-04	7.25E-04	2.44E-04	2.42E-03
Formaldehyde	50-00-0	7.37E-05	7.37E-05	7.37E-05	2.48E-05	2.46E-04
Naphthalene	91-20-3	1.21E-04	1.21E-04	1.21E-04	4.09E-05	4.05E-04
Propylene		2.61E-03	2.61E-03	2.61E-03	8.78E-04	8.70E-03
Toluene	108-88-3	2.63E-04	2.63E-04	2.63E-04	8.84E-05	8.76E-04
Xylene (o,m,p)	1332-20-7	1.80E-04	1.80E-04	1.80E-04	6.07E-05	6.02E-04
Acenaphthene	83-32-9	4.37E-06	4.37E-06	4.37E-06	1.47E-06	1.46E-05
Acenaphthylene	203-96-8	8.63E-06	8.63E-06	8.63E-06	2.90E-06	2.88E-05
Anthracene	120-12-7	1.15E-06	1.15E-06	1.15E-06	3.87E-07	3.84E-06
Benz(a)anthracene	56-55-3	5.81E-07	5.81E-07	5.81E-07	1.96E-07	1.94E-06
Benzo(a)pyrene	50-32-8	2.40E-07	2.40E-07	2.40E-07	8.08E-08	8.01E-07
Benzo(b)fluoranthene	205-99-2	1.04E-06	1.04E-06	1.04E-06	3.49E-07	3.46E-06
Benzo(g,h,i)perylene	191-24-2	5.20E-07	5.20E-07	5.20E-07	1.75E-07	1.73E-06
Benzo(k)fluoranthene	205-82-3	2.04E-07	2.04E-07	2.04E-07	6.86E-08	6.80E-07
Chrysene	218-01-9	1.43E-06	1.43E-06	1.43E-06	4.81E-07	4.77E-06
Dibenzo(a,h)anthracene	53-70-3	3.23E-07	3.23E-07	3.23E-07	1.09E-07	1.08E-06
Fluoranthene	206-44-0	3.77E-06	3.77E-06	3.77E-06	1.27E-06	1.26E-05
Fluorene	86-73-7	1.20E-05	1.20E-05	1.20E-05	4.03E-06	3.99E-05
Indeno(1,2,3-cd)pyrene	193-39-5	3.87E-07	3.87E-07	3.87E-07	1.30E-07	1.29E-06
Phenanthrene	85-01-8	3.81E-05	3.81E-05	3.81E-05	1.28E-05	1.27E-04
Pyrene	129-00-0	3.47E-06	3.47E-06	3.47E-06	1.17E-06	1.16E-05
Polycyclic Organic Matter (POM)		7.62E-05	7.62E-05	7.62E-05	2.56E-05	2.54E-04
Max HAP						7.25E-04
Total HAP						1.44E-03

## NOTES

Please refer to Tables 21-24 for detailed calculations for each emission unit in GP004.

TABLE A26 : EU19-20 EMISSION CALCULATIONS (NATURAL GAS)									
Parameter	Value	Units	Source						
Emission Unit	EU19-20		MPCA Emission Unit ID						
Make	Ray Pac								
Model	H34001								
Maximum Heat Input (per boiler)	4.000	MMBtu/hr	Per Boiler						
Fuel	Natural Gas								
Maximum Fuel Input (per boiler)	0.0040	MMSCF/hr	(Maximum Heat Input)/(Fuel Heat Value)						
Unlimited Annual Operation	8760	hr/yr	Number of hours in a year						
Unlimited Annual Fuel Input (per boiler)	35	MMSCF/yr	(Maximum Fuel Input) * (Unlimited Annual Operation)						
Annual Limit	none								
Fuel Heat Value	1000	btu/scf	Manufacturer specification						
Number of Boilers	2								
Criteria Pollutants									
Pollutant	CAS	Emission Factor		Unlimited Emission Rate (lb/hr-boiler)	Unlimited Emission Rate (tpy per boiler)	Limited Emission Rate Each Boiler (tpy)	Unlimited Emission Rate All Boilers (tpy)	Limited Emission Rate All Boilers (tpy)	NOTES
PM		7.60	lb/MMSCF	0.030	0.13	0.13	0.27	0.27	A
PM10		7.60	lb/MMSCF	0.030	0.13	0.13	0.27	0.27	A
PM2.5		7.60	lb/MMSCF	0.030	0.13	0.13	0.27	0.27	A
SO <sub>2</sub>		0.60	lb/MMSCF	0.002	0.01	0.01	0.02	0.02	A
NO <sub>x</sub>		100.00	lb/MMSCF	0.400	1.75	1.75	3.50	3.50	B
VOC		5.50	lb/MMSCF	0.022	0.10	0.10	0.19	0.19	A
CO		84.00	lb/MMSCF	0.336	1.47	1.47	2.94	2.94	B
Greenhouse Gas (CO <sub>2</sub> e)				481	2,107	2,107	4,215	4,215	G
CO <sub>2</sub>		120161	lb/MMSCF	481	2,105	2,105	4,210	4,210	E
CH <sub>4</sub>		2.27E+00	lb/MMSCF	9.07E-03	3.97E-02	3.97E-02	7.94E-02	7.94E-02	F
N <sub>2</sub> O		2.27E-01	lb/MMSCF	9.07E-04	3.97E-03	3.97E-03	7.94E-03	7.94E-03	F
Organics									
Benzene	71-43-2	2.10E-03	lb/MMSCF	8.40E-06	3.68E-05	3.68E-05	7.36E-05	7.36E-05	C
Butane	106-97-8	2.10E+00	lb/MMSCF	8.40E-03	3.68E-02	3.68E-02	7.36E-02	7.36E-02	C
Dichlorobenzene	25321-22-6	1.20E-03	lb/MMSCF	4.80E-06	2.10E-05	2.10E-05	4.20E-05	4.20E-05	C
Ethane	74-84-0	3.10E+00	lb/MMSCF	1.24E-02	5.43E-02	5.43E-02	1.09E-01	1.09E-01	C
Formaldehyde	50-00-0	7.50E-02	lb/MMSCF	3.00E-04	1.31E-03	1.31E-03	2.63E-03	2.63E-03	C
Hexane	110-54-3	1.80E+00	lb/MMSCF	7.20E-03	3.15E-02	3.15E-02	6.31E-02	6.31E-02	C
Naphthalene	91-20-3	6.10E-04	lb/MMSCF	2.44E-06	1.07E-05	1.07E-05	2.14E-05	2.14E-05	C
Pentane	109-66-0	2.60E+00	lb/MMSCF	1.04E-02	4.56E-02	4.56E-02	9.11E-02	9.11E-02	C
Propane	74-98-6	1.60E+00	lb/MMSCF	6.40E-03	2.80E-02	2.80E-02	5.61E-02	5.61E-02	C
Toluene	108-88-3	3.40E-03	lb/MMSCF	1.36E-05	5.96E-05	5.96E-05	1.19E-04	1.19E-04	C
Acenaphthene	83-32-9	1.80E-06	lb/MMSCF	7.20E-09	3.15E-08	3.15E-08	6.31E-08	6.31E-08	C
Acenaphthylene	203-96-8	1.80E-06	lb/MMSCF	7.20E-09	3.15E-08	3.15E-08	6.31E-08	6.31E-08	C
Anthracene	120-12-7	2.40E-06	lb/MMSCF	9.60E-09	4.20E-08	4.20E-08	8.41E-08	8.41E-08	C
Benz(a)anthracene	56-55-3	1.80E-06	lb/MMSCF	7.20E-09	3.15E-08	3.15E-08	6.31E-08	6.31E-08	C
Benzo(a)pyrene	50-32-8	1.20E-06	lb/MMSCF	4.80E-09	2.10E-08	2.10E-08	4.20E-08	4.20E-08	C
Benzo(b)fluoranthene	205-99-2	1.80E-06	lb/MMSCF	7.20E-09	3.15E-08	3.15E-08	6.31E-08	6.31E-08	C
Benzo(g,h,i)perylene	191-24-2	1.20E-06	lb/MMSCF	4.80E-09	2.10E-08	2.10E-08	4.20E-08	4.20E-08	C
Benzo(k)fluoranthene	205-82-3	1.80E-06	lb/MMSCF	7.20E-09	3.15E-08	3.15E-08	6.31E-08	6.31E-08	C
Chrysene	218-01-9	1.80E-06	lb/MMSCF	7.20E-09	3.15E-08	3.15E-08	6.31E-08	6.31E-08	C
Dibenzo(a,h)anthracene	53-70-3	1.20E-06	lb/MMSCF	4.80E-09	2.10E-08	2.10E-08	4.20E-08	4.20E-08	C
7,12-Dimethylbenz(a)anthracene	57-97-6	1.60E-05	lb/MMSCF	6.40E-08	2.80E-07	2.80E-07	5.61E-07	5.61E-07	C
Fluoranthene	206-44-0	3.00E-06	lb/MMSCF	1.20E-08	5.26E-08	5.26E-08	1.05E-07	1.05E-07	C
Fluorene	86-73-7	2.80E-06	lb/MMSCF	1.12E-08	4.91E-08	4.91E-08	9.81E-08	9.81E-08	C
Indeno(1,2,3-cd)pyrene	193-39-5	1.80E-06	lb/MMSCF	7.20E-09	3.15E-08	3.15E-08	6.31E-08	6.31E-08	C
2-Methylnaphthalene	91-57-6	2.40E-05	lb/MMSCF	9.60E-08	4.20E-07	4.20E-07	8.41E-07	8.41E-07	C
3-Methylchloranthrene	56-49-5	1.80E-06	lb/MMSCF	7.20E-09	3.15E-08	3.15E-08	6.31E-08	6.31E-08	C
Phenanthrene	85-01-8	1.70E-05	lb/MMSCF	6.80E-08	2.98E-07	2.98E-07	5.96E-07	5.96E-07	C
Pyrene	129-00-0	5.00E-05	lb/MMSCF	2.00E-07	8.76E-07	8.76E-07	1.75E-06	1.75E-06	C
Polycyclic Organic Matter (POM)					2.33E-06	2.33E-06	4.67E-06	4.67E-06	
Metals									
Arsenic	7440-38-2	2.00E-04	lb/MMSCF	8.00E-07	3.50E-06	3.50E-06	7.01E-06	7.01E-06	D
Barium	7440-39-3	4.40E-03	lb/MMSCF	1.76E-05	7.71E-05	7.71E-05	1.54E-04	1.54E-04	D
Beryllium	7440-41-7	1.20E-05	lb/MMSCF	4.80E-08	2.10E-07	2.10E-07	4.20E-07	4.20E-07	D
Cadmium	7440-43-9	1.10E-03	lb/MMSCF	4.40E-06	1.93E-05	1.93E-05	3.85E-05	3.85E-05	D
Chromium	7440-47-3	1.40E-03	lb/MMSCF	5.60E-06	2.45E-05	2.45E-05	4.91E-05	4.91E-05	D
Cobalt	7440-48-4	8.40E-05	lb/MMSCF	3.36E-07	1.47E-06	1.47E-06	2.94E-06	2.94E-06	D
Copper	7440-50-8	8.50E-04	lb/MMSCF	3.40E-06	1.49E-05	1.49E-05	2.98E-05	2.98E-05	D
Lead	7139-92-1	5.00E-04	lb/MMSCF	2.00E-06	8.76E-06	8.76E-06	1.75E-05	1.75E-05	D
Manganese	7439-96-5	3.80E-04	lb/MMSCF	1.52E-06	6.66E-06	6.66E-06	1.33E-05	1.33E-05	D
Mercury	7439-97-6	2.60E-04	lb/MMSCF	1.04E-06	4.56E-06	4.56E-06	9.11E-06	9.11E-06	D
Molybdenum	7439-98-7	1.10E-03	lb/MMSCF	4.40E-06	1.93E-05	1.93E-05	3.85E-05	3.85E-05	D
Nickel	7440-02-0	2.10E-03	lb/MMSCF	8.40E-06	3.68E-05	3.68E-05	7.36E-05	7.36E-05	D
Selenium	7782-49-2	2.40E-05	lb/MMSCF	9.60E-08	4.20E-07	4.20E-07	8.41E-07	8.41E-07	D
Vanadium	7440-62-2	2.30E-03	lb/MMSCF	9.20E-06	4.03E-05	4.03E-05	8.06E-05	8.06E-05	D
Zinc	7440-66-6	2.90E-02	lb/MMSCF	1.16E-04	5.08E-04	5.08E-04	1.02E-03	1.02E-03	D
Max HAP					3.15E-02	3.15E-02	6.31E-02	6.31E-02	
Total HAP					3.31E-02	3.31E-02	6.62E-02	6.62E-02	

## NOTES

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AP-42 Table 1.4-2

AP-42 Table 1.4-1

AP-42 Table 1.4-3

AP-42 Table 1.4-4

40 CFR Part 98 Table C-1: Pipeline natural gas = 1028 btu/scf, CO<sub>2</sub> emission = 53.02 kg CO<sub>2</sub>/mmBtu = 120162 lb/MMscf40 CFR Part 98 Table C-2: Pipeline natural gas = 1028 btu/scf, CH<sub>4</sub> = 0.001 kg CH<sub>4</sub>/mmBtu, N<sub>2</sub>O = 0.0001 kg N<sub>2</sub>O / mmBtuCO<sub>2</sub>e = (Global Warming Potential, GWP) \* (Emission). GWP from 40 CFR Part 98 Table A-1. CO<sub>2</sub> = 1, CH<sub>4</sub> = 21, N<sub>2</sub>O = 310

TABLE A27 : EU21-24, EU28 EMISSION CALCULATIONS (NATURAL GAS)									
Parameter	Value	Units	Source						
Emission Unit	EU21-24 & 28		MPCA Emission Unit ID						
Make	Hydrotherm								
Model	KN-30								
Maximum Heat Input (per boiler)	3.000	MMBtu/hr							
Fuel	Natural Gas								
Maximum Fuel Input (per boiler)	0.0030	MMSCF/hr	(Maximum Heat Input)/(Fuel Heat Value)						
Unlimited Annual Operation	8760	hr/yr	Number of hours in a year						
Unlimited Annual Fuel Input (per boiler)	26	MMSCF/yr	(Maximum Fuel Input) * (Unlimited Annual Operation)						
Annual Limit	none								
Fuel Heat Value	1000	btu/scf	Manufacturer specification						
Number of Boilers	5								
Criteria Pollutants									
Pollutant	CAS	Emission Factor	Unlimited Emission Rate (lb/hr-boiler)	Unlimited Emission Rate (tpy per boiler)	Limited Emission Rate Each Boiler (tpy)	Unlimited Emission Rate All Boilers (tpy)	Limited Emission Rate All Boilers (tpy)	NOTES	
PM		7.60 lb/MMSCF	0.023	0.10	0.10	0.50	0.50	A	
PM10		7.60 lb/MMSCF	0.023	0.10	0.10	0.50	0.50	A	
PM2.5		7.60 lb/MMSCF	0.023	0.10	0.10	0.50	0.50	A	
SO <sub>2</sub>		0.60 lb/MMSCF	0.002	0.01	0.01	0.04	0.04	A	
NO <sub>x</sub>		100.00 lb/MMSCF	0.300	1.31	1.31	6.57	6.57	B	
VOC		5.50 lb/MMSCF	0.017	0.07	0.07	0.36	0.36	A	
CO		84.00 lb/MMSCF	0.252	1.10	1.10	5.52	5.52	B	
Greenhouse Gas (CO <sub>2</sub> e)			361	1,580	1,580	7,902	7,902	G	
CO <sub>2</sub>		120161 lb/MMSCF	360	1,579	1,579	7,895	7,895	E	
CH <sub>4</sub>		2.27E+00 lb/MMSCF	6.80E-03	2.98E-02	2.98E-02	1.49E-01	1.49E-01	F	
N <sub>2</sub> O		2.27E-01 lb/MMSCF	6.80E-04	2.98E-03	2.98E-03	1.49E-02	1.49E-02	F	
Organics									
Benzene	71-43-2	2.10E-03 lb/MMSCF	6.30E-06	2.76E-05	2.76E-05	1.38E-04	1.38E-04	C	
Butane	106-97-8	2.10E+00 lb/MMSCF	6.30E-03	2.76E-02	2.76E-02	1.38E-01	1.38E-01	C	
Dichlorobenzene	25321-22-6	1.20E-03 lb/MMSCF	3.60E-06	1.58E-05	1.58E-05	7.88E-05	7.88E-05	C	
Ethane	74-84-0	3.10E+00 lb/MMSCF	9.30E-03	4.07E-02	4.07E-02	2.04E-01	2.04E-01	C	
Formaldehyde	50-00-0	7.50E-02 lb/MMSCF	2.25E-04	9.86E-04	9.86E-04	4.93E-03	4.93E-03	C	
Hexane	110-54-3	1.80E+00 lb/MMSCF	5.40E-03	2.37E-02	2.37E-02	1.18E-01	1.18E-01	C	
Naphthalene	91-20-3	6.10E-04 lb/MMSCF	1.83E-06	8.02E-06	8.02E-06	4.01E-05	4.01E-05	C	
Pentane	109-66-0	2.60E+00 lb/MMSCF	7.80E-03	3.42E-02	3.42E-02	1.71E-01	1.71E-01	C	
Propane	74-98-6	1.60E+00 lb/MMSCF	4.80E-03	2.10E-02	2.10E-02	1.05E-01	1.05E-01	C	
Toluene	108-88-3	3.40E-03 lb/MMSCF	1.02E-05	4.47E-05	4.47E-05	2.23E-04	2.23E-04	C	
Acenaphthene	83-32-9	1.80E-06 lb/MMSCF	5.40E-09	2.37E-08	2.37E-08	1.18E-07	1.18E-07	C	
Acenaphthylene	203-96-8	1.80E-06 lb/MMSCF	5.40E-09	2.37E-08	2.37E-08	1.18E-07	1.18E-07	C	
Anthracene	120-12-7	2.40E-06 lb/MMSCF	7.20E-09	3.15E-08	3.15E-08	1.58E-07	1.58E-07	C	
Benz(a)anthracene	56-55-3	1.80E-06 lb/MMSCF	5.40E-09	2.37E-08	2.37E-08	1.18E-07	1.18E-07	C	
Benzo(a)pyrene	50-32-8	1.20E-06 lb/MMSCF	3.60E-09	1.58E-08	1.58E-08	7.88E-08	7.88E-08	C	
Benzo(b)fluoranthene	205-99-2	1.80E-06 lb/MMSCF	5.40E-09	2.37E-08	2.37E-08	1.18E-07	1.18E-07	C	
Benzo(g,h,i)perylene	191-24-2	1.20E-06 lb/MMSCF	3.60E-09	1.58E-08	1.58E-08	7.88E-08	7.88E-08	C	
Benzo(k)fluoranthene	205-82-3	1.80E-06 lb/MMSCF	5.40E-09	2.37E-08	2.37E-08	1.18E-07	1.18E-07	C	
Chrysene	218-01-9	1.80E-06 lb/MMSCF	5.40E-09	2.37E-08	2.37E-08	1.18E-07	1.18E-07	C	
Dibenzo(a,h)anthracene	53-70-3	1.20E-06 lb/MMSCF	3.60E-09	1.58E-08	1.58E-08	7.88E-08	7.88E-08	C	
7,12-Dimethylbenz(a)anthracene	57-97-6	1.60E-05 lb/MMSCF	4.80E-08	2.10E-07	2.10E-07	1.05E-06	1.05E-06	C	
Fluoranthene	206-44-0	3.00E-06 lb/MMSCF	9.00E-09	3.94E-08	3.94E-08	1.97E-07	1.97E-07	C	
Fluorene	86-73-7	2.80E-06 lb/MMSCF	8.40E-09	3.68E-08	3.68E-08	1.84E-07	1.84E-07	C	
Indeno(1,2,3-cd)pyrene	193-39-5	1.80E-06 lb/MMSCF	5.40E-09	2.37E-08	2.37E-08	1.18E-07	1.18E-07	C	
2-Methylnaphthalene	91-57-6	2.40E-05 lb/MMSCF	7.20E-08	3.15E-07	3.15E-07	1.58E-06	1.58E-06	C	
3-Methylchloranthrene	56-49-5	1.80E-06 lb/MMSCF	5.40E-09	2.37E-08	2.37E-08	1.18E-07	1.18E-07	C	
Phenanthrene	85-01-8	1.70E-05 lb/MMSCF	5.10E-08	2.23E-07	2.23E-07	1.12E-06	1.12E-06	C	
Pyrene	129-00-0	5.00E-05 lb/MMSCF	1.50E-07	6.57E-07	6.57E-07	3.29E-06	3.29E-06	C	
Polycyclic Organic Matter (POM)				1.75E-06	1.75E-06	8.75E-06	8.75E-06		
Metals									
Arsenic	7440-38-2	2.00E-04 lb/MMSCF	6.00E-07	2.63E-06	2.63E-06	1.31E-05	1.31E-05	D	
Barium	7440-39-3	4.40E-03 lb/MMSCF	1.32E-05	5.78E-05	5.78E-05	2.89E-04	2.89E-04	D	
Beryllium	7440-41-7	1.20E-05 lb/MMSCF	3.60E-08	1.58E-07	1.58E-07	7.88E-07	7.88E-07	D	
Cadmium	7440-43-9	1.10E-03 lb/MMSCF	3.30E-06	1.45E-05	1.45E-05	7.23E-05	7.23E-05	D	
Chromium	7440-47-3	1.40E-03 lb/MMSCF	4.20E-06	1.84E-05	1.84E-05	9.20E-05	9.20E-05	D	
Cobalt	7440-48-4	8.40E-05 lb/MMSCF	2.52E-07	1.10E-06	1.10E-06	5.52E-06	5.52E-06	D	
Copper	7440-50-8	8.50E-04 lb/MMSCF	2.55E-06	1.12E-05	1.12E-05	5.58E-05	5.58E-05	D	
Lead	7139-92-1	5.00E-04 lb/MMSCF	1.50E-06	6.57E-06	6.57E-06	3.29E-05	3.29E-05	D	
Manganese	7439-96-5	3.80E-04 lb/MMSCF	1.14E-06	4.99E-06	4.99E-06	2.50E-05	2.50E-05	D	
Mercury	7439-97-6	2.60E-04 lb/MMSCF	7.80E-07	3.42E-06	3.42E-06	1.71E-05	1.71E-05	D	
Molybdenum	7439-98-7	1.10E-03 lb/MMSCF	3.30E-06	1.45E-05	1.45E-05	7.23E-05	7.23E-05	D	
Nickel	7440-02-0	2.10E-03 lb/MMSCF	6.30E-06	2.76E-05	2.76E-05	1.38E-04	1.38E-04	D	
Selenium	7782-49-2	2.40E-05 lb/MMSCF	7.20E-08	3.15E-07	3.15E-07	1.58E-06	1.58E-06	D	
Vanadium	7440-62-2	2.30E-03 lb/MMSCF	6.90E-06	3.02E-05	3.02E-05	1.51E-04	1.51E-04	D	
Zinc	7440-66-6	2.90E-02 lb/MMSCF	8.70E-05	3.81E-04	3.81E-04	1.91E-03	1.91E-03	D	
Max HAP				2.37E-02	2.37E-02	1.18E-01	1.18E-01		
Total HAP				2.48E-02	2.48E-02	1.24E-01	1.24E-01		

## NOTES

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AP-42 Table 1.4-2

AP-42 Table 1.4-1

AP-42 Table 1.4-3

AP-42 Table 1.4-4

40 CFR Part 98 Table C-1: Pipeline natural gas = 1028 btu/scf, CO<sub>2</sub> emission = 53.02 kg CO<sub>2</sub>/mmBtu = 120162 lb/MMscf40 CFR Part 98 Table C-2: Pipeline natural gas = 1028 btu/scf, CH<sub>4</sub> = 0.001 kg CH<sub>4</sub>/mmBtu, N<sub>2</sub>O = 0.0001 kg N<sub>2</sub>O / mmBtuCO<sub>2</sub>e = (Global Warming Potential, GWP) \* (Emission). GWP from 40 CFR Part 98 Table A-1. CO<sub>2</sub> = 1, CH<sub>4</sub> = 21, N<sub>2</sub>O = 310

EU025-026 EMISSION CALCULATIONS (NATURAL GAS)									
Parameter	Value	Units	Source						
Emission Unit	EU025-026		MPCA Emission Unit ID						
Make	Lattner								
Model	WLF - 40								
Maximum Heat Input (per boiler)	1.675	MMBtu/hr							
Fuel	Natural Gas								
Maximum Fuel Input (per boiler)	0.0017	MMSCF/hr	(Maximum Heat Input)/(Fuel Heat Value)						
Unlimited Annual Operation	8760	hr/yr	Number of hours in a year						
Unlimited Annual Fuel Input (per boiler)	15	MMSCF/yr	(Maximum Fuel Input) * (Unlimited Annual Operation)						
Annual Limit	none								
Fuel Heat Value	1000	btu/scf	Manufacturer specification						
Number of Boilers	2								
Criteria Pollutants									
Pollutant	CAS	Emission Factor	Unlimited Emission Rate (lb/hr-boiler)	Unlimited Emission Rate (tpy per boiler)	Limited Emission Rate Each Boiler (tpy)	Unlimited Emission Rate All Boilers (tpy)	Limited Emission Rate All Boilers (tpy)	NOTES	
PM		7.60 lb/MMSCF	0.013	0.06	0.06	0.11	0.11	A	
PM10		7.60 lb/MMSCF	0.013	0.06	0.06	0.11	0.11	A	
PM2.5		7.60 lb/MMSCF	0.013	0.06	0.06	0.11	0.11	A	
SO <sub>2</sub>		0.60 lb/MMSCF	0.001	0.004	0.00	0.01	0.01	A	
NO <sub>x</sub>		100.00 lb/MMSCF	0.168	0.73	0.73	1.47	1.47	B	
VOC		5.50 lb/MMSCF	0.009	0.04	0.04	0.08	0.08	A	
CO		84.00 lb/MMSCF	0.141	0.62	0.62	1.23	1.23	B	
Greenhouse Gas (CO <sub>2</sub> e)			201	882	882	1,765	1,765	G	
CO <sub>2</sub>		120161 lb/MMSCF	201	882	882	1,763	1,763	E	
CH <sub>4</sub>		2.27E+00 lb/MMSCF	3.80E-03	1.66E-02	1.66E-02	3.33E-02	3.33E-02	F	
N <sub>2</sub> O		2.27E-01 lb/MMSCF	3.80E-04	1.66E-03	1.66E-03	3.33E-03	3.33E-03	F	
Organics									
Benzene	71-43-2	2.10E-03 lb/MMSCF	3.52E-06	1.54E-05	1.54E-05	3.08E-05	3.08E-05	C	
Butane	106-97-8	2.10E+00 lb/MMSCF	3.52E-03	1.54E-02	1.54E-02	3.08E-02	3.08E-02	C	
Dichlorobenzene	25321-22-6	1.20E-03 lb/MMSCF	2.01E-06	8.80E-06	8.80E-06	1.76E-05	1.76E-05	C	
Ethane	74-84-0	3.10E+00 lb/MMSCF	5.19E-03	2.27E-02	2.27E-02	4.55E-02	4.55E-02	C	
Formaldehyde	50-00-0	7.50E-02 lb/MMSCF	1.26E-04	5.50E-04	5.50E-04	1.10E-03	1.10E-03	C	
Hexane	110-54-3	1.80E+00 lb/MMSCF	3.02E-03	1.32E-02	1.32E-02	2.64E-02	2.64E-02	C	
Naphthalene	91-20-3	6.10E-04 lb/MMSCF	1.02E-06	4.48E-06	4.48E-06	8.95E-06	8.95E-06	C	
Pentane	109-66-0	2.60E+00 lb/MMSCF	4.36E-03	1.91E-02	1.91E-02	3.81E-02	3.81E-02	C	
Propane	74-98-6	1.60E+00 lb/MMSCF	2.68E-03	1.17E-02	1.17E-02	2.35E-02	2.35E-02	C	
Toluene	108-88-3	3.40E-03 lb/MMSCF	5.70E-06	2.49E-05	2.49E-05	4.99E-05	4.99E-05	C	
Acenaphthene	83-32-9	1.80E-06 lb/MMSCF	3.02E-09	1.32E-08	1.32E-08	2.64E-08	2.64E-08	C	
Acenaphthylene	203-96-8	1.80E-06 lb/MMSCF	3.02E-09	1.32E-08	1.32E-08	2.64E-08	2.64E-08	C	
Anthracene	120-12-7	2.40E-06 lb/MMSCF	4.02E-09	1.76E-08	1.76E-08	3.52E-08	3.52E-08	C	
Benz(a)anthracene	56-55-3	1.80E-06 lb/MMSCF	3.02E-09	1.32E-08	1.32E-08	2.64E-08	2.64E-08	C	
Benzo(a)pyrene	50-32-8	1.20E-06 lb/MMSCF	2.01E-09	8.80E-09	8.80E-09	1.76E-08	1.76E-08	C	
Benzo(b)fluoranthene	205-99-2	1.80E-06 lb/MMSCF	3.02E-09	1.32E-08	1.32E-08	2.64E-08	2.64E-08	C	
Benzo(g,h,i)perylene	191-24-2	1.20E-06 lb/MMSCF	2.01E-09	8.80E-09	8.80E-09	1.76E-08	1.76E-08	C	
Benzo(k)fluoranthene	205-82-3	1.80E-06 lb/MMSCF	3.02E-09	1.32E-08	1.32E-08	2.64E-08	2.64E-08	C	
Chrysene	218-01-9	1.80E-06 lb/MMSCF	3.02E-09	1.32E-08	1.32E-08	2.64E-08	2.64E-08	C	
Dibenzo(a,h)anthracene	53-70-3	1.20E-06 lb/MMSCF	2.01E-09	8.80E-09	8.80E-09	1.76E-08	1.76E-08	C	
7,12-Dimethylbenz(a)anthracene	57-97-6	1.60E-05 lb/MMSCF	2.68E-08	1.17E-07	1.17E-07	2.35E-07	2.35E-07	C	
Fluoranthene	206-44-0	3.00E-06 lb/MMSCF	5.03E-09	2.20E-08	2.20E-08	4.40E-08	4.40E-08	C	
Fluorene	86-73-7	2.80E-06 lb/MMSCF	4.69E-09	2.05E-08	2.05E-08	4.11E-08	4.11E-08	C	
Indeno(1,2,3-cd)pyrene	193-39-5	1.80E-06 lb/MMSCF	3.02E-09	1.32E-08	1.32E-08	2.64E-08	2.64E-08	C	
2-Methylnaphthalene	91-57-6	2.40E-05 lb/MMSCF	4.02E-08	1.76E-07	1.76E-07	3.52E-07	3.52E-07	C	
3-Methylchloranthrene	56-49-5	1.80E-06 lb/MMSCF	3.02E-09	1.32E-08	1.32E-08	2.64E-08	2.64E-08	C	
Phenanthrene	85-01-8	1.70E-05 lb/MMSCF	2.85E-08	1.25E-07	1.25E-07	2.49E-07	2.49E-07	C	
Pyrene	129-00-0	5.00E-05 lb/MMSCF	8.38E-08	3.67E-07	3.67E-07	7.34E-07	7.34E-07	C	
Polycyclic Organic Matter (POM)				9.77E-07	9.77E-07	1.95E-06	1.95E-06		
Metals									
Arsenic	7440-38-2	2.00E-04 lb/MMSCF	3.35E-07	1.47E-06	1.47E-06	2.93E-06	2.93E-06	D	
Barium	7440-39-3	4.40E-03 lb/MMSCF	7.37E-06	3.23E-05	3.23E-05	6.46E-05	6.46E-05	D	
Beryllium	7440-41-7	1.20E-05 lb/MMSCF	2.01E-08	8.80E-08	8.80E-08	1.76E-07	1.76E-07	D	
Cadmium	7440-43-9	1.10E-03 lb/MMSCF	1.84E-06	8.07E-06	8.07E-06	1.61E-05	1.61E-05	D	
Chromium	7440-47-3	1.40E-03 lb/MMSCF	2.35E-06	1.03E-05	1.03E-05	2.05E-05	2.05E-05	D	
Cobalt	7440-48-4	8.40E-05 lb/MMSCF	1.41E-07	6.16E-07	6.16E-07	1.23E-06	1.23E-06	D	
Copper	7440-50-8	8.50E-04 lb/MMSCF	1.42E-06	6.24E-06	6.24E-06	1.25E-05	1.25E-05	D	
Lead	7139-92-1	5.00E-04 lb/MMSCF	8.38E-07	3.67E-06	3.67E-06	7.34E-06	7.34E-06	D	
Manganese	7439-96-5	3.80E-04 lb/MMSCF	6.37E-07	2.79E-06	2.79E-06	5.58E-06	5.58E-06	D	
Mercury	7439-97-6	2.60E-04 lb/MMSCF	4.36E-07	1.91E-06	1.91E-06	3.81E-06	3.81E-06	D	
Molybdenum	7439-98-7	1.10E-03 lb/MMSCF	1.84E-06	8.07E-06	8.07E-06	1.61E-05	1.61E-05	D	
Nickel	7440-02-0	2.10E-03 lb/MMSCF	3.52E-06	1.54E-05	1.54E-05	3.08E-05	3.08E-05	D	
Selenium	7782-49-2	2.40E-05 lb/MMSCF	4.02E-08	1.76E-07	1.76E-07	3.52E-07	3.52E-07	D	
Vanadium	7440-62-2	2.30E-03 lb/MMSCF	3.85E-06	1.69E-05	1.69E-05	3.37E-05	3.37E-05	D	
Zinc	7440-66-6	2.90E-02 lb/MMSCF	4.86E-05	2.13E-04	2.13E-04	4.26E-04	4.26E-04	D	
Max HAP				1.32E-02	1.32E-02	2.64E-02	2.64E-02		
Total HAP				1.39E-02	1.39E-02	2.77E-02	2.77E-02		

## NOTES

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AP-42 Table 1.4-2

AP-42 Table 1.4-1

AP-42 Table 1.4-3

AP-42 Table 1.4-4

40 CFR Part 98 Table C-1: Pipeline natural gas = 1028 btu/scf, CO<sub>2</sub> emission = 53.02 kg CO<sub>2</sub>/mmBtu = 120162 lb/MMscf40 CFR Part 98 Table C-2: Pipeline natural gas = 1028 btu/scf, CH<sub>4</sub> = 0.001 kg CH<sub>4</sub>/mmBtu, N<sub>2</sub>O = 0.0001 kg N<sub>2</sub>O / mmBtuCO<sub>2</sub>e = (Global Warming Potential, GWP) \* (Emission). GWP from 40 CFR Part 98 Table A-1. CO<sub>2</sub> = 1, CH<sub>4</sub> = 21, N<sub>2</sub>O = 310

TABLE A29 : GP05 EMISSION CALCULATION SUMMARY					
Parameter	Value	Units	Source		
Emission Unit	GP005		MPCA Emission Unit ID		
Annual Limit	8760	hours			
Criteria Pollutants					
Pollutant	CAS	EU21-24, 28	EU25-26	EU19-20	GP005 Limited
PM		0.50	0.11	0.27	0.88
PM10		0.50	0.11	0.27	0.88
PM2.5		0.50	0.11	0.27	0.88
SO2		0.04	0.01	0.02	0.07
NOx		6.57	1.47	3.50	11.54
VOC		0.36	0.08	0.19	0.63
CO		5.52	1.23	2.94	9.69
Greenhouse Gas (CO <sub>2</sub> e)		7,902	1,765	4,215	13,882
CO <sub>2</sub>		7895	1763	4210	13868
CH <sub>4</sub>		1.49E-01	3.33E-02	7.94E-02	2.62E-01
N <sub>2</sub> O		1.49E-02	3.33E-03	7.94E-03	2.62E-02
Organics					
Benzene	71-43-2	1.38E-04	3.08E-05	7.36E-05	2.42E-04
Butane	106-97-8	1.38E-01	3.08E-02	7.36E-02	2.42E-01
Dichlorobenzene	25321-22-6	7.88E-05	1.76E-05	4.20E-05	1.38E-04
Ethane	74-84-0	2.04E-01	4.55E-02	1.09E-01	3.58E-01
Formaldehyde	50-00-0	4.93E-03	1.10E-03	2.63E-03	8.66E-03
Hexane	110-54-3	1.18E-01	2.64E-02	6.31E-02	2.08E-01
Naphthalene	91-20-3	4.01E-05	8.95E-06	2.14E-05	7.04E-05
Pentane	109-66-0	1.71E-01	3.81E-02	9.11E-02	3.00E-01
Propane	74-98-6	1.05E-01	2.35E-02	5.61E-02	1.85E-01
Toluene	108-88-3	2.23E-04	4.99E-05	1.19E-04	3.92E-04
Acenaphthene	83-32-9	1.18E-07	2.64E-08	6.31E-08	2.08E-07
Acenaphthylene	203-96-8	1.18E-07	2.64E-08	6.31E-08	2.08E-07
Anthracene	120-12-7	1.58E-07	3.52E-08	8.41E-08	2.77E-07
Benz(a)anthracene	56-55-3	1.18E-07	2.64E-08	6.31E-08	2.08E-07
Benzo(a)pyrene	50-32-8	7.88E-08	1.76E-08	4.20E-08	1.38E-07
Benzo(b)fluoranthene	205-99-2	1.18E-07	2.64E-08	6.31E-08	2.08E-07
Benzo(g,h,i)perylene	191-24-2	7.88E-08	1.76E-08	4.20E-08	1.38E-07
Benzo(k)fluoranthene	205-82-3	1.18E-07	2.64E-08	6.31E-08	2.08E-07
Chrysene	218-01-9	1.18E-07	2.64E-08	6.31E-08	2.08E-07
Dibenzo(a,h)anthracene	53-70-3	7.88E-08	1.76E-08	4.20E-08	1.38E-07
7,12-Dimethylbenz(a)anthracene	57-97-6	1.05E-06	2.35E-07	5.61E-07	1.85E-06
Fluoranthene	206-44-0	1.97E-07	4.40E-08	1.05E-07	3.46E-07
Fluorene	86-73-7	1.84E-07	4.11E-08	9.81E-08	3.23E-07
Indeno(1,2,3-cd)pyrene	193-39-5	1.18E-07	2.64E-08	6.31E-08	2.08E-07
2-Methylnaphthalene	91-57-6	1.58E-06	3.52E-07	8.41E-07	2.77E-06
3-Methylchloranthrene	56-49-5	1.18E-07	2.64E-08	6.31E-08	2.08E-07
Phenanthrene	85-01-8	1.12E-06	2.49E-07	5.96E-07	1.96E-06
Pyrene	129-00-0	3.29E-06	7.34E-07	1.75E-06	5.77E-06
Polycyclic Organic Matter (POM)		8.75E-06	1.95E-06	4.67E-06	1.54E-05
Metals					
Arsenic	7440-38-2	1.31E-05	2.93E-06	7.01E-06	2.31E-05
Barium	7440-39-3	2.89E-04	6.46E-05	1.54E-04	5.08E-04
Beryllium	7440-41-7	7.88E-07	1.76E-07	4.20E-07	1.38E-06
Cadmium	7440-43-9	7.23E-05	1.61E-05	3.85E-05	1.27E-04
Chromium	7440-47-3	9.20E-05	2.05E-05	4.91E-05	1.62E-04
Cobalt	7440-48-4	5.52E-06	1.23E-06	2.94E-06	9.69E-06
Copper	7440-50-8	5.58E-05	1.25E-05	2.98E-05	9.81E-05
Lead	7139-92-1	3.29E-05	7.34E-06	1.75E-05	5.77E-05
Manganese	7439-96-5	2.50E-05	5.58E-06	1.33E-05	4.39E-05
Mercury	7439-97-6	1.71E-05	3.81E-06	9.11E-06	3.00E-05
Molybdenum	7439-98-7	7.23E-05	1.61E-05	3.85E-05	1.27E-04
Nickel	7440-02-0	1.38E-04	3.08E-05	7.36E-05	2.42E-04
Selenium	7782-49-2	1.58E-06	3.52E-07	8.41E-07	2.77E-06
Vanadium	7440-62-2	1.51E-04	3.37E-05	8.06E-05	2.65E-04
Zinc	7440-66-6	1.91E-03	4.26E-04	1.02E-03	3.35E-03
Max HAP		1.18E-01	0.0264114	0.063072	2.08E-01
Total HAP		1.24E-01	0.027710007	0.066173152	2.18E-01

## NOTES

Please refer to Tables 26-28 for detailed calculations for each emission unit in GP005.

EU27 EMISSION CALCULATIONS (FUEL OIL)							
Parameter	Value	Units		Source			
Emission Unit	EU27			MPCA Emission Unit ID			
Make	Caterpillar						
Model	DM8263						
Maximum Output	2937	bhp					
Fuel	No 2 Fuel Oil						
Maximum Fuel Input	138	gal/hr					
Unlimited Annual Operation	500	hr/yr		Unlimited Operation for an emergency generator = 500 hours/yr			
Unlimited Annual Fuel Input	69,000	gal/yr		(Maximum Fuel Input) * (Unlimited Annual Operation)			
Annual Limit	300	hr/yr		Permit Limit			
Fuel Heat Value	0.14	MMBtu/gal		AP-42 Section 1.3			
Maximum Heat Input	19.32	MMBtu/hr		(Maximum Fuel Input) * (Fuel Heat Value)			
Criteria Pollutants							
Pollutant	CAS	Emission Factor		Unlimited Emission Rate (lb/hr)	Unlimited Emission Rate (tpy)	Limited Emission Rate (tpy)	NOTES
PM		0.2300	lb/hr	0.230	0.06	0.03	C
PM10		0.2300	lb/hr	0.230	0.06	0.03	C
PM2.5		0.2300	lb/hr	0.230	0.06	0.03	C
SO2		0.002	lb/MMBtu	0.029	0.01	0.004	A, B
NOx		42.10	lb/hr	42.100	10.53	6.32	C
VOC		0.93	lb/hr	0.930	0.23	0.14	A
CO		3.45	lb/hr	3.450	0.86	0.52	A
Greenhouse Gas (CO2e)		163.60	lb/MMBtu	3,160.774	790	474	G
CO2		163.1	lb/MMBtu	3,150.169	788	473	E
CH4		0.007	lb/MMBtu	0.128	0	0	F
N2O		0.001	lb/MMBtu	0.026	0	0	F
Organics							
Acetaldehyde	75-07-0	2.52E-05	lb/MMBtu	3.48E-06	8.69E-07	5.22E-07	D
Acrolein	107-02-8	7.88E-06	lb/MMBtu	1.09E-06	2.72E-07	1.63E-07	D
Benzene	71-43-2	7.76E-04	lb/MMBtu	1.50E-02	3.75E-03	2.25E-03	D
Formaldehyde	50-00-0	7.89E-05	lb/MMBtu	1.52E-03	3.81E-04	2.29E-04	D
Naphthalene	91-20-3	1.30E-04	lb/MMBtu	2.51E-03	6.28E-04	3.77E-04	D
Propylene		2.79E-03	lb/MMBtu	5.39E-02	1.35E-02	8.09E-03	D
Toluene	108-88-3	2.81E-04	lb/MMBtu	5.43E-03	1.36E-03	8.14E-04	D
Xylene (o,m,p)	1332-20-7	1.93E-04	lb/MMBtu	3.73E-03	9.32E-04	5.59E-04	D
Acenaphthene	83-32-9	4.68E-06	lb/MMBtu	9.04E-05	2.26E-05	1.36E-05	D
Acenaphthylene	203-96-8	9.23E-06	lb/MMBtu	1.78E-04	4.46E-05	2.67E-05	D
Anthracene	120-12-7	1.23E-06	lb/MMBtu	2.38E-05	5.94E-06	3.56E-06	D
Benz(a)anthracene	56-55-3	6.22E-07	lb/MMBtu	1.20E-05	3.00E-06	1.80E-06	D
Benzo(a)pyrene	50-32-8	2.57E-07	lb/MMBtu	4.97E-06	1.24E-06	7.45E-07	D
Benzo(b)fluoranthene	205-99-2	1.11E-06	lb/MMBtu	2.14E-05	5.36E-06	3.22E-06	D
Benzo(g,h,i)perylene	191-24-2	5.56E-07	lb/MMBtu	1.07E-05	2.69E-06	1.61E-06	D
Benzo(k)fluoranthene	205-82-3	2.18E-07	lb/MMBtu	4.21E-06	1.05E-06	6.32E-07	D
Chrysene	218-01-9	1.53E-06	lb/MMBtu	2.96E-05	7.39E-06	4.43E-06	D
Dibenzo(a,h)anthracene	53-70-3	3.46E-07	lb/MMBtu	6.68E-06	1.67E-06	1.00E-06	D
Fluoranthene	206-44-0	4.03E-06	lb/MMBtu	7.79E-05	1.95E-05	1.17E-05	D
Fluorene	86-73-7	1.28E-05	lb/MMBtu	2.47E-04	6.18E-05	3.71E-05	D
Indeno(1,2,3-cd)pyrene	193-39-5	4.14E-07	lb/MMBtu	8.00E-06	2.00E-06	1.20E-06	D
Phenanthrene	85-01-8	4.08E-05	lb/MMBtu	7.88E-04	1.97E-04	1.18E-04	D
Pyrene	129-00-0	3.71E-06	lb/MMBtu	7.17E-05	1.79E-05	1.08E-05	D
Polycyclic Organic Matter (POM)		8.15E-05		1.58E-03	3.94E-04	2.36E-04	
Max HAP					3.75E-03	2.25E-03	
Total HAP					7.44E-03	4.46E-03	

## NOTES

- A AP-42 Table 3.4-1
- B Sulfur Content= 0.0015 % wt
- C Manufacturer, not to exceed at 100% load.
- D AP-42 Table 3.4-3 and 3.4-4
- E 40 CFR Part 98 Table C-1: Pipeline natural gas = 1028 btu/scf, CO<sub>2</sub> emission = 53.02 kg CO<sub>2</sub>/mmBtu = 120162 lb/MMscf
- F 40 CFR Part 98 Table C-2: Pipeline natural gas = 1028 btu/scf, CH<sub>4</sub> = 0.001 kg CH<sub>4</sub>/mmBtu, N<sub>2</sub>O = 0.0001 kg N<sub>2</sub>O / mmBt
- G CO<sub>2</sub>e = (Global Warming Potential, GWP) \* (Emission). GWP from 40 CFR Part 98 Table A-1. CO<sub>2</sub> = 1, CH<sub>4</sub> = 21, N<sub>2</sub>O = 310

TABLE A31 : EMISSION CALCULATIONS FOR TWO NEW BOILERS (INSIGNIFICANT ACTIVITIES UNDER MN 7007.1300 Subp. 3(i))

TABLE A31 : EMISSION CALCULATIONS FOR TWO NEW BOILERS (INSIGNIFICANT ACTIVITIES UNDER MN 7007.1300 Subp. 3(i))									
Parameter	Value	Units	Source						
Emission Unit	N/A		These are insignificant emission units						
Make	Fulton								
Model	WLF - 40								
Maximum Heat Input (per boiler)	0.199	MMBtu/hr							
Fuel	Natural Gas								
Maximum Fuel Input (per boiler)	0.0002	MMSCF/hr	(Maximum Heat Input)/(Fuel Heat Value)						
Unlimited Annual Operation	8760	hr/yr	Number of hours in a year						
Unlimited Annual Fuel Input (per boiler)	2	MMSCF/yr	(Maximum Fuel Input) * (Unlimited Annual Operation)						
Annual Limit	none								
Fuel Heat Value	1000	btu/scf	Assumption						
Number of Boilers	2								
Criteria Pollutants									
Pollutant	CAS	Emission Factor		Unlimited Emission Rate (lb/hr-boiler)	Unlimited Emission Rate (tpy per boiler)	Limited Emission Rate Each Boiler (tpy)	Unlimited Emission Rate All Boilers (tpy)	Limited Emission Rate All Boilers (tpy)	NOTES
PM		7.60	lb/MMSCF	0.002	0.01	0.01	0.01	0.01	A
PM10		7.60	lb/MMSCF	0.002	0.01	0.01	0.01	0.01	A
PM2.5		7.60	lb/MMSCF	0.002	0.01	0.01	0.01	0.01	A
SO <sub>2</sub>		0.60	lb/MMSCF	0.000	0.001	0.00	0.00	0.00	A
NO <sub>x</sub>		100.00	lb/MMSCF	0.020	0.09	0.09	0.17	0.17	B
VOC		5.50	lb/MMSCF	0.001	0.00	0.00	0.01	0.01	A
CO		84.00	lb/MMSCF	0.017	0.07	0.07	0.15	0.15	B
Greenhouse Gas (CO <sub>2</sub> e)				24	105	105	210	210	G
CO <sub>2</sub>		120161	lb/MMSCF	24	105	105	209	209	E
CH <sub>4</sub>		2.27E+00	lb/MMSCF	4.51E-04	1.98E-03	1.98E-03	3.95E-03	3.95E-03	F
N <sub>2</sub> O		2.27E-01	lb/MMSCF	4.51E-05	1.98E-04	1.98E-04	3.95E-04	3.95E-04	F

## NOTES

- A AP-42 Table 1.4-2
- B AP-42 Table 1.4-1
- C AP-42 Table 1.4-3
- D AP-42 Table 1.4-4
- E 40 CFR Part 98 Table C-1: Pipeline natural gas = 1028 btu/scf, CO<sub>2</sub> emission = 53.02 kg CO<sub>2</sub>/mmBtu = 120162 lb/MMscf
- F 40 CFR Part 98 Table C-2: Pipeline natural gas = 1028 btu/scf, CH<sub>4</sub> = 0.001 kg CH<sub>4</sub>/mmBtu, N<sub>2</sub>O = 0.0001 kg N<sub>2</sub>O / mmBtu
- G CO<sub>2</sub>e = (Global Warming Potential, GWP) \* (Emission). GWP from 40 CFR Part 98 Table A-1. CO<sub>2</sub> = 1, CH<sub>4</sub> = 21, N<sub>2</sub>O = 310

Abbott Northwestern Hospital  
Permit No. 05300061-002  
Technical Support Document

## **Attachment 3**

### **Facility Description and CD-01**



FACILITY DESCRIPTION: GROUPS (GP)

Show: Active and Pending Records  
Action: PER 002  
AQD Facility ID: 05300061  
Facility Name: Abbott Northwestern Hospital

ID No.	Group Status	Added By (Action)	Retired By (Action)	Include in EI	Operator ID for Item	Group Description	Group Items
1 GP 001	Active	PER 001		<input type="checkbox"/>		No. 6 Fuel Oil Boilers	EU 001, EU 002, EU 003, EU 004
2 GP 001	Active	PER 002		<input type="checkbox"/>		Main Campus Natural Gas/No. 2 Fuel Oil Boilers (EU001-EU004)	EU 001, EU 002, EU 003, EU 004
3 GP 002	Active	PER 001		<input type="checkbox"/>		Emergency Generators 1	EU 005, EU 006, EU 007, EU 008, EU 009, EU 010
4 GP 002	Active	PER 002		<input type="checkbox"/>		Emergency Generators 1-10	EU 005, EU 006, EU 007, EU 008, EU 009, EU 010, EU 015, EU 016, EU 017, EU 018
5 GP 003	Active	PER 001		<input type="checkbox"/>		No. 2 Distillate Fuel Oil Boilers	EU 011, EU 012, EU 013, EU 014
6 GP 003	Active	PER 002		<input type="checkbox"/>		Heart Hospital Natural Gas/No. 2 Fuel Oil Boilers (EU011-EU014)	EU 011, EU 012, EU 013, EU 014
7 GP 004	Active	PER 001		<input type="checkbox"/>		Emergency Generators 2	EU 015, EU 016, EU 017, EU 018
8 GP 004	Active	PER 002		<input type="checkbox"/>		Natural Gas Boilers (10th Ave Bldg/Garage)	EU 019, EU 020, EU 021, EU 022, EU 023, EU 024, EU 025, EU 026, EU 028
9 GP 005	Active	PER 002		<input type="checkbox"/>		Ethylene Oxide Sterilizers and Abator	CE 001, EU 029, EU 030

**FACILITY DESCRIPTION: EMISSION UNIT (EU)**

Show: Active and Pending Records

Action: PER 002

AQD Facility ID: 05300061

Facility Name: Abbott Northwestern Hospital

ID No.	Emission Unit Status	Added By (Action)	Retired By (Action)	Insignificant Activity	Operator ID for Item	Stack/Vent ID No(s).	Control Equip. ID No(s).	Operator Description	Manufacturer	Model Number	SIC	Max. Design Capacity	Maximum Design Capacity		Max Fuel Input (mil Btu)
													Materials	Units n	Units d
1 EU 001	Active	PER 001		<input type="checkbox"/>		SV 001 (M)		Package Watertube Boiler 1	Bros	W2-37	8062	29	Heat	Mmbtu Hr	29
2 EU 002	Active	PER 001		<input type="checkbox"/>		SV 001 (M)		Package Watertube Boiler 2	Bros	W2-37	8062	29	Heat	Mmbtu Hr	29
3 EU 003	Active	PER 001		<input type="checkbox"/>		SV 001 (M)		Package Watertube Boiler 3	Bros	W2-37	8062	29	Heat	Mmbtu Hr	29
4 EU 004	Active	PER 001		<input type="checkbox"/>		SV 001 (M)		Package Watertube Boiler 4	Cleaver Brooks	WT 439X-CN6	8062	77	Heat	Mmbtu Hr	77
5 EU 005	Active	PER 001		<input type="checkbox"/>		SV 002 (M)		Reciprocating Engine Generator 1	Cummins	VT-1710-GS	8062	685	Energy	Hp	4.56
6 EU 006	Active	PER 001		<input type="checkbox"/>		SV 003 (M)		Reciprocating Engine Generator 2	Cummins	VT-1710-GS	8062	685	Energy	Hp	4.56
7 EU 007	Active	PER 001		<input type="checkbox"/>		SV 004 (M)		Reciprocating Engine Generator 3	Cummins	KTTA 19-G1	8062	685	Energy	Hp	5.13
8 EU 008	Active	PER 001		<input type="checkbox"/>		SV 005 (M)		Reciprocating Engine Generator 4	Onan	KTTA 19-G1	8062	685	Energy	Hp	5.13
9 EU 009	Active	PER 001		<input type="checkbox"/>		SV 006 (M)		Reciprocating Engine Generator 5	Onan	VTA-28 G2	8062	890	Energy	Hp	6.83
10 EU 010	Active	PER 001		<input type="checkbox"/>		SV 007 (M)		Reciprocating Engine Generator 6	Cummins	NT-855-GS	8062	355	Energy	Hp	2.39
11 EU 011	Active	PER 001		<input type="checkbox"/>		SV 008 (M)		Flexible Watertube Boiler 5	Cleaver Brooks	FLX-900	8062	9	Heat	Mmbtu Hr	9
12 EU 012	Active	PER 001		<input type="checkbox"/>		SV 008 (M)		Flexible Watertube Boiler 6	Cleaver Brooks	FLX-900	8062	9	Heat	Mmbtu Hr	9
13 EU 013	Active	PER 001		<input type="checkbox"/>		SV 008 (M)		Flexible Watertube Boiler 7	Cleaver Brooks	FLX-900	8062	9	Heat	Mmbtu Hr	9
14 EU 014	Active	PER 001		<input type="checkbox"/>		SV 008 (M)		Flexible Watertube Boiler 8	Cleaver Brooks	FLX-900	8062	9	Heat	Mmbtu Hr	9
15 EU 015	Active	PER 001		<input type="checkbox"/>		SV 009 (M)		Reciprocating Engine Generator 7	Cummins	QST30-G1	8062	1135	Energy	Hp	13.9
16 EU 016	Active	PER 001		<input type="checkbox"/>		SV 010 (M)		Reciprocating Engine Generator 8	Cummins	QST30-G1	8062	1135	Energy	Hp	13.9
17 EU 017	Active	PER 001		<input type="checkbox"/>		SV 011 (M)		Reciprocating Engine Generator 9	Cummins	QST30-G1	8062	1135	Energy	Hp	13.9
18 EU 018	Active	PER 001		<input type="checkbox"/>		SV 012 (M)		Reciprocating Engine Generator 10	Caterpillar	3306B	8062	382	Energy	Hp	2.7
19 EU 019	Active	PER 002		<input type="checkbox"/>		SV 013 (M)		Raypak H34001 (parking garage)	Raypak	H34001	8062	3.28	Heat	Mmbtu Hr	4.0
20 EU 020	Active	PER 002		<input type="checkbox"/>		SV 014 (M)		Raypak H34001 (parking garage)	Raypak	H34001	8062	3.28	Heat	Mmbtu Hr	4.0
21 EU 021	Active	PER 002		<input type="checkbox"/>		SV 015 (M)		Hydrotherm KN-30 #1(10th Ave-Lab)	Hydrotherm	KN-30	8062	2.78	Heat	Mmbtu Hr	3.0

FACILITY DESCRIPTION: EMISSION UNIT (EU)

ID No.	Emission Unit Status	Added By (Action)	Commence Const. Date	Initial Startup Date	Removal Date	Firing Method	Pct. Fuel/Space Heat	Bottleneck	Elevator Type
1	EU 001	Active	PER 001	01/01/1956			100	Group of Sources	
2	EU 002	Active	PER 001	01/01/1956			100	Group of Sources	
3	EU 003	Active	PER 001	01/01/1956			100	Group of Sources	
4	EU 004	Active	PER 001	01/01/1972			100	Group of Sources	
5	EU 005	Active	PER 001	01/01/1978					
6	EU 006	Active	PER 001	01/01/1978					
7	EU 007	Active	PER 001	01/01/1987					
8	EU 008	Active	PER 001	01/01/1991					
9	EU 009	Active	PER 001	06/15/1993					
10	EU 010	Active	PER 001	01/01/1983					
11	EU 011	Active	PER 001	10/01/2002			100		
12	EU 012	Active	PER 001	10/01/2002			100		
13	EU 013	Active	PER 001	10/01/2002			100		
14	EU 014	Active	PER 001	10/01/2002			100		
15	EU 015	Active	PER 001	10/01/2002					
16	EU 016	Active	PER 001	10/01/2002					
17	EU 017	Active	PER 001	10/01/2002					
18	EU 018	Active	PER 001	10/01/2003					
19	EU 019	Active	PER 002	01/01/2000					
20	EU 020	Active	PER 002	01/01/2000					
21	EU 021	Active	PER 002	01/01/2011					

FACILITY DESCRIPTION: EMISSION UNIT (EU)

Show: Active and Pending Records

Action: PER 002

AQD Facility ID: 05300061

Facility Name: Abbott Northwestern Hospital

ID No.	Emission Unit Status	Added By (Action)	Retired By (Action)	Insignif-icant Activity	Operator ID for Item	Stack/Vent ID No(s).	Control Equip. ID No(s).	Operator Description	Manufacturer	Model Number	SIC	Max. Design Capacity	Maximum Design Capacity		Max Fuel Input (mil Btu)
													Materials	Units n	Units d
22 EU 022	Active	PER 002		<input type="checkbox"/>		SV 016 (M)		Hydrotherm KN-30 #2(10th Ave-Lab)	Hydrotherm	KN-30	8062	2.78	Heat	Mmbtu Hr	3.0
23 EU 023	Active	PER 002		<input type="checkbox"/>		SV 017 (M)		Hydrotherm KN-30 #3(10th Ave-Lab)	Hydrotherm	KN-30	8062	2.78	Heat	Mmbtu Hr	3.0
24 EU 024	Active	PER 002		<input type="checkbox"/>		SV 018 (M)		Hydrotherm KN-30 #4(10th Ave-Lab)	Hydrotherm	KN-30	8062	2.78	Heat	Mmbtu Hr	3.0
25 EU 025	Active	PER 002		<input type="checkbox"/>		SV 019 (M)		Lattner#5 (10th Ave-Lab)	Lattner	WLF-40-LS-15	8062	1.6	Heat	Mmbtu Hr	1.6
26 EU 026	Active	PER 002		<input type="checkbox"/>		SV 020 (M)		Lattner#6 (10th Ave-Lab)	Lattner	WLF-40-LS-15	8062	1.6	Heat	Mmbtu Hr	1.6
27 EU 027	Active	PER 002		<input type="checkbox"/>		SV 021 (M)		Caterpillar 3516C (10th Ave-Lab)	Caterpillar	3516C	8062	2937	Energy	BHp	19.3
28 EU 028	Active	PER 002		<input type="checkbox"/>		SV 022 (M)		Hydrotherm KN-30 #7(10th Ave)	Hydrotherm	KN-30	8062	2.78	Heat	Mmbtu Hr	3.0
29 EU 029	Active	PER 002		<input type="checkbox"/>				Ethylene Oxide Sterilizer	3M	8XL	8062	6		Oz Cycle	
30 EU 030	Active	PER 002		<input type="checkbox"/>				Ethylene Oxide Sterilizer		8XL	8062	6		Oz Cycle	

FACILITY DESCRIPTION: EMISSION UNIT (EU)

	ID No.	Emission Unit Status	Added By (Action)	Commence Const. Date	Initial Startup Date	Removal Date	Firing Method	Pct. Fuel/ Space Heat	Bottleneck	Elevator Type
22	EU 022	Active	PER 002	01/01/2011	12/01/2011					
23	EU 023	Active	PER 002	01/01/2011	12/01/2011					
24	EU 024	Active	PER 002	01/01/2011	12/01/2011					
25	EU 025	Active	PER 002	01/01/2011	12/01/2011					
26	EU 026	Active	PER 002	01/01/2011	12/01/2011					
27	EU 027	Active	PER 002	01/01/2011	12/01/2011					
28	EU 028	Active	PER 002	01/01/2011	12/01/2011					
29	EU 029	Active	PER 002							
30	EU 030	Active	PER 002							

FACILITY DESCRIPTION: CONTROL EQUIPMENT (CE)

Show: Active and Pending Records  
Action: PER 002  
AQD Facility ID: 05300061  
Facility Name: Abbott Northwestern Hospital

ID No.	Control Equip. Status	Added By (Action)	Retired By (Action)	Operator ID for Item	Control Equip. Type	Control Equipment Description	Manufacturer	Model	Pollutants Controlled	Capture Efficiency (%)	Destruction/Collection Efficiency (%)	Afterburner Combustion Parameters
1	CE 001	Active	PER 002		099	Ethylene Oxide Abator	3M	Model 50	Ethylene o	100	99.9	



## FACILITY DESCRIPTION: STACK/VENTS (SV)

Show: Active and Pending Records

Action: PER 002

AQD Facility ID: 05300061

Facility Name: Abbott Northwestern Hospital

ID No.	Stack/ Vent Status	Added By (Action)	Retired By (Action)	Operator ID for Item	Operators Description	Height of Opening From Ground (feet)	Inside Dimensions		Design Flow Rate at Top (ACFM)	Exit Gas Temperature at Top (°F)	Flow Rate/ Temperature Information Source	Discharge Direction
							Diameter or Length (feet)	Width (feet)				
1	SV 001	Active	PER 001		Boilers 1-4	100.0	6.00		61688	524	Manufacturer	Up, No Cap
2	SV 002	Active	PER 001		Engine 1	20.0	0.83		3600	955	Manufacturer	Up, With Cap
3	SV 003	Active	PER 001		Engine 2	20.0	0.83		3600	955	Manufacturer	Up, With Cap
4	SV 004	Active	PER 001		Engine 3	20.0	0.83		3630	915	Manufacturer	Up, With Cap
5	SV 005	Active	PER 001		Engine 4	30.0	0.42		3630	915	Manufacturer	Up, With Cap
6	SV 006	Active	PER 001		Engine 5	35.0	0.80		5455	950	Manufacturer	Up, With Cap
7	SV 007	Active	PER 001		Engine 6	20.0	0.50		3190	980	Manufacturer	Up, With Cap
8	SV 008	Active	PER 001		Boilers 5-8	130.0	2.50		12000	520	Manufacturer	Up, No Cap
9	SV 009	Active	PER 001		Engine 7	22.0	1.00		6160	895	Manufacturer	Up, With Cap
10	SV 010	Active	PER 001		Engine 8	22.0	1.00		6160	895	Manufacturer	Up, With Cap
11	SV 011	Active	PER 001		Engine 9	22.0	1.00		6160	895	Manufacturer	Up, With Cap
12	SV 012	Active	PER 001		Engine 10 (proposed)	30.0	0.5		2175	994	Manufacturer	Up, With Cap
13	SV 012	Active	PER 002		Engine 10	30.0	0.5		2175	994	Manufacturer	Up, With Cap
14	SV 013	Active	PER 002		Raypak Boiler H34001	100	3.5		1085	350	Manufacturer	Up, No Cap
15	SV 014	Active	PER 002		Raypak Boiler H34001	100	3.5		1085	350	Manufacturer	Up, No Cap
16	SV 015	Active	PER 002		Hydrotherm KN-30	119	1.17		643	180	Estimate	Up, With Cap
17	SV 016	Active	PER 002		Hydrotherm KN-30	119	1.17		643	180	Estimate	Up, With Cap
18	SV 017	Active	PER 002		Hydrotherm KN-30	119	1.17		643	180	Estimate	Up, With Cap
19	SV 018	Active	PER 002		Hydrotherm KN-30	119	1.17		643	180	Estimate	Up, With Cap
20	SV 019	Active	PER 002		Lattner WLF-40-LS-15	118	1.00		426	300	Manufacturer	Up, No Cap
21	SV 020	Active	PER 002		Lattner WLF-40-LS-15	118	1.00		426	300	Manufacturer	Up, No Cap
22	SV 021	Active	PER 002		Caterpillar 3516C	30	0.25		15292	752	Manufacturer	Up, No Cap
23	SV 022	Active	PER 002		Hydrotherm KN-30	119	1.17		643	180	Estimate	Up, With Cap

## FACILITY DESCRIPTION: Potential-to-emit (by pollutant)

Show: Active and Pending Records

AQD Facility ID: 05300061

Facility Name: Abbott Northwestern Hospital

Pollutant	Item	Added By (Action)	Retired By (Action)	Hourly Potential (lbs per hr)	Unrestricted Potential (tons per yr)	Limited Potential (tons per yr)	Actual Emissions (tons per yr)
<b>Acetaldehyde</b>							
	EU 005	PER 002		8.200E-07	2.050E-07	1.230E-07	
	EU 006	PER 002		8.200E-07	2.050E-07	1.230E-07	
	EU 007	PER 002		9.230E-07	2.310E-07	1.380E-07	
	EU 008	PER 002		9.230E-07	2.310E-07	1.380E-07	
	EU 009	PER 002		1.230E-06	3.080E-07	1.850E-07	
	EU 010	PER 002		4.310E-07	1.080E-07	6.460E-08	
	EU 015	PER 002		1.120E-06	2.800E-07	1.680E-07	
	EU 016	PER 002		1.120E-06	2.800E-07	1.680E-07	
	EU 017	PER 002		1.120E-06	2.800E-07	1.680E-07	
	EU 018	PER 002		3.770E-07	9.440E-08	5.660E-08	
	EU 027	PER 002		3.480E-06	8.690E-07	5.220E-07	
Totals					3.091E-06	1.854E-06	0.000E+00
<b>Acrolein</b>							
	EU 005	PER 002		2.560E-07	6.410E-08	3.850E-08	
	EU 006	PER 002		2.560E-07	6.410E-08	3.850E-08	
	EU 007	PER 002		2.880E-07	7.210E-08	4.330E-08	
	EU 008	PER 002		2.880E-07	7.210E-08	4.330E-08	
	EU 009	PER 002		3.850E-07	9.620E-08	5.770E-08	
	EU 010	PER 002		1.350E-07	3.370E-08	2.020E-08	
	EU 015	PER 002		3.510E-07	8.770E-08	5.260E-08	
	EU 016	PER 002		3.510E-07	8.770E-08	5.260E-08	
	EU 017	PER 002		3.510E-07	8.770E-08	5.260E-08	
	EU 018	PER 002		1.180E-07	2.950E-08	1.770E-08	
	EU 027	PER 002		1.090E-06	2.720E-07	1.630E-07	
Totals					9.669E-07	5.800E-07	0.000E+00
<b>Benzene</b>							
	EU 001	PER 002		5.970E-05	2.620E-04		
	EU 002	PER 002		5.970E-05	2.620E-04		
	EU 003	PER 002		5.970E-05	2.620E-04		
	EU 004	PER 002		1.590E-04	6.940E-04		
	EU 005	PER 002		3.540E-03	8.840E-04	5.300E-04	
	EU 006	PER 002		3.540E-03	8.840E-04	5.300E-04	
	EU 007	PER 002		3.980E-03	9.940E-04	5.970E-04	
	EU 008	PER 002		3.980E-03	9.940E-04	5.970E-04	
	EU 009	PER 002		5.300E-03	1.330E-03	7.950E-04	



## FACILITY DESCRIPTION: Potential-to-emit (by pollutant)

Show: Active and Pending Records

AQD Facility ID: 05300061

Facility Name: Abbott Northwestern Hospital

Pollutant	Item	Added By (Action)	Retired By (Action)	Hourly Potential (lbs per hr)	Unrestricted Potential (tons per yr)	Limited Potential (tons per yr)	Actual Emissions (tons per yr)
<b>Benzene</b>	EU 010	PER 002		1.860E-03	4.640E-04	2.780E-04	
	EU 011	PER 002		1.800E-05	7.880E-05		
	EU 012	PER 002		1.800E-05	7.880E-05		
	EU 013	PER 002		1.800E-05	7.880E-05		
	EU 014	PER 002		1.800E-05	7.880E-05		
	EU 015	PER 002		4.830E-03	1.210E-03	7.250E-04	
	EU 016	PER 002		4.830E-03	1.210E-03	7.250E-04	
	EU 017	PER 002		4.830E-03	1.210E-03	7.250E-04	
	EU 018	PER 002		1.630E-03	4.070E-04	2.440E-04	
	EU 019	PER 002		8.400E-06	3.680E-05	3.680E-05	
	EU 020	PER 002		8.400E-06	3.680E-05	3.680E-05	
	EU 021	PER 002		6.300E-06	2.760E-05	2.760E-05	
	EU 022	PER 002		6.300E-06	2.760E-05	2.760E-05	
	EU 023	PER 002		6.300E-06	2.760E-05	2.760E-05	
	EU 024	PER 002		6.300E-06	2.760E-05	2.760E-05	
	EU 025	PER 002		3.520E-06	1.540E-05	1.540E-05	
	EU 026	PER 002		3.520E-06	1.540E-05	1.540E-05	
	EU 027	PER 002		1.500E-02	3.750E-03	2.250E-03	
	EU 028	PER 002		6.300E-06	2.760E-05	2.760E-05	
	GP 001	PER 002				6.320E-04	
	GP 003	PER 002				3.150E-04	
<b>Totals</b>					1.537E-02	9.185E-03	0.000E+00
<b>Arsenic compounds</b>	EU 001	PER 002		1.160E-04	5.080E-04		
	EU 002	PER 002		1.160E-04	5.080E-04		
	EU 003	PER 002		1.160E-04	5.080E-04		
	EU 004	PER 002		3.080E-04	1.350E-03		
	EU 011	PER 002		3.580E-05	1.570E-04		
	EU 012	PER 002		3.580E-05	1.570E-04		
	EU 013	PER 002		3.580E-05	1.570E-04		
	EU 014	PER 002		3.580E-05	1.570E-04		
	EU 019	PER 002		8.000E-07	3.500E-06	3.500E-06	
	EU 020	PER 002		8.000E-07	3.500E-06	3.500E-06	
	EU 021	PER 002		6.000E-07	2.630E-06	2.630E-06	
	EU 022	PER 002		6.000E-07	2.630E-06	2.630E-06	

## FACILITY DESCRIPTION: Potential-to-emit (by pollutant)

Show: Active and Pending Records

AQD Facility ID: 05300061

Facility Name: Abbott Northwestern Hospital

Pollutant	Item	Added By (Action)	Retired By (Action)	Hourly Potential (lbs per hr)	Unrestricted Potential (tons per yr)	Limited Potential (tons per yr)	Actual Emissions (tons per yr)
<b>Arsenic compounds</b>							
	EU 023	PER 002		6.000E-07	2.630E-06	2.630E-06	
	EU 024	PER 002		6.000E-07	2.630E-06	2.630E-06	
	EU 025	PER 002		3.350E-07	1.470E-06	1.470E-06	
	EU 026	PER 002		3.350E-07	1.470E-06	1.470E-06	
	EU 027	PER 002					
	EU 028	PER 002		6.000E-07	2.630E-06	2.630E-06	
	GP 001	PER 002				2.640E-04	
	GP 003	PER 002				6.660E-05	
<b>Totals</b>					3.525E-03	3.537E-04	0.000E+00
<b>Beryllium Compounds</b>							
	EU 001	PER 002		8.700E-05	3.810E-04		
	EU 002	PER 002		8.700E-05	3.810E-04		
	EU 003	PER 002		8.700E-05	3.810E-04		
	EU 004	PER 002		2.310E-04	1.010E-03		
	EU 011	PER 002		2.690E-05	1.180E-04		
	EU 012	PER 002		2.690E-05	1.180E-04		
	EU 013	PER 002		2.690E-05	1.180E-04		
	EU 014	PER 002		2.690E-05	1.180E-04		
	EU 019	PER 002		4.800E-08	2.100E-07	2.100E-07	
	EU 020	PER 002		4.800E-08	2.100E-07	2.100E-07	
	EU 021	PER 002		3.600E-08	1.580E-07	1.580E-07	
	EU 022	PER 002		3.600E-08	1.580E-07	1.580E-07	
	EU 023	PER 002		3.600E-08	1.580E-07	1.580E-07	
	EU 024	PER 002		3.600E-08	1.580E-07	1.580E-07	
	EU 025	PER 002		2.010E-08	8.800E-08	8.800E-08	
	EU 026	PER 002		2.010E-08	8.800E-08	8.800E-08	
	EU 027	PER 002					
	EU 028	PER 002		3.600E-08	1.580E-07	1.580E-07	
	GP 001	PER 002				1.620E-04	
	GP 003	PER 002				3.050E-05	
<b>Totals</b>					2.626E-03	1.939E-04	0.000E+00
<b>Carbon Dioxide Equivalent</b>							
	EU 001	PER 002		4.677E+03	2.048E+04		
	EU 002	PER 002		4.677E+03	2.048E+04		
	EU 003	PER 002		4.677E+03	2.048E+04		

## FACILITY DESCRIPTION: Potential-to-emit (by pollutant)

Show: Active and Pending Records

AQD Facility ID: 05300061

Facility Name: Abbott Northwestern Hospital

Pollutant	Item	Added By (Action)	Retired By (Action)	Hourly Potential (lbs per hr)	Unrestricted Potential (tons per yr)	Limited Potential (tons per yr)	Actual Emissions (tons per yr)
<b>Carbon Dioxide Equivalent</b>							
	EU 004	PER 002		1.242E+04	5.439E+04		
	EU 005	PER 002		7.450E+02	1.860E+02	1.120E+02	
	EU 006	PER 002		7.450E+02	1.860E+02	1.120E+02	
	EU 007	PER 002		8.390E+02	2.100E+02	1.260E+02	
	EU 008	PER 002		8.390E+02	2.100E+02	1.260E+02	
	EU 009	PER 002		1.118E+03	2.790E+02	1.680E+02	
	EU 010	PER 002		3.910E+02	9.800E+01	5.900E+01	
	EU 011	PER 002		1.445E+03	6.329E+03		
	EU 012	PER 002		1.445E+03	6.329E+03		
	EU 013	PER 002		1.445E+03	6.329E+03		
	EU 014	PER 002		1.445E+03	6.329E+03		
	EU 015	PER 002		1.019E+03	2.550E+02	1.530E+02	
	EU 016	PER 002		1.019E+03	2.550E+02	1.530E+02	
	EU 017	PER 002		1.019E+03	2.550E+02	1.530E+02	
	EU 018	PER 002		3.430E+02	8.600E+01	5.100E+01	
	EU 019	PER 002		4.810E+02	2.107E+03	2.107E+03	
	EU 020	PER 002		4.810E+02	2.107E+03	2.107E+03	
	EU 021	PER 002		3.610E+02	1.580E+03	1.580E+03	
	EU 022	PER 002		3.610E+02	1.580E+03	1.580E+03	
	EU 023	PER 002		3.610E+02	1.580E+03	1.580E+03	
	EU 024	PER 002		3.610E+02	1.580E+03	1.580E+03	
	EU 025	PER 002		2.010E+02	8.820E+02	8.820E+02	
	EU 026	PER 002		2.010E+02	8.820E+02	8.820E+02	
	EU 027	PER 002		3.161E+03	7.900E+02	4.740E+02	
	EU 028	PER 002		3.610E+02	1.580E+03	1.580E+03	
	GP 001	PER 002				4.010E+04	
	GP 003	PER 002				1.851E+04	
Totals					1.578E+05	7.417E+04	0.000E+00
<b>Cadmium compounds</b>							
	EU 001	PER 002		8.700E-05	3.810E-04		
	EU 002	PER 002		8.700E-05	3.810E-04		
	EU 003	PER 002		8.700E-05	3.810E-04		
	EU 004	PER 002		2.310E-04	1.010E-03		
	EU 011	PER 002		2.690E-05	1.180E-04		
	EU 012	PER 002		2.690E-05	1.180E-04		

## FACILITY DESCRIPTION: Potential-to-emit (by pollutant)

Show: Active and Pending Records

AQD Facility ID: 05300061

Facility Name: Abbott Northwestern Hospital

Pollutant	Item	Added By (Action)	Retired By (Action)	Hourly Potential (lbs per hr)	Unrestricted Potential (tons per yr)	Limited Potential (tons per yr)	Actual Emissions (tons per yr)
<b>Cadmium compounds</b>							
	EU 013	PER 002		2.690E-05	1.180E-04		
	EU 014	PER 002		2.690E-05	1.180E-04		
	EU 019	PER 002		4.400E-06	1.900E-05	1.900E-05	
	EU 020	PER 002		4.400E-06	1.900E-05	1.900E-05	
	EU 021	PER 002		3.300E-06	1.450E-05	1.450E-05	
	EU 022	PER 002		3.300E-06	1.450E-05	1.450E-05	
	EU 023	PER 002		3.300E-06	1.450E-05	1.450E-05	
	EU 024	PER 002		3.300E-06	1.450E-05	1.450E-05	
	EU 025	PER 002		1.840E-06	8.070E-06	8.070E-06	
	EU 026	PER 002		1.840E-06	8.070E-06	8.070E-06	
	EU 027	PER 002					
	EU 028	PER 002		3.300E-06	1.450E-05	1.450E-05	
	GP 001	PER 002				4.470E-04	
	GP 003	PER 002				1.840E-04	
Totals					2.752E-03	7.576E-04	0.000E+00
<b>Carbon Monoxide</b>							
	EU 001	PER 001		9.700E-01	4.230E+00		
	EU 001	PER 002		2.390E+00	1.046E+01		
	EU 002	PER 001		9.700E-01	4.230E+00		
	EU 002	PER 002		2.390E+00	1.046E+01		
	EU 003	PER 001		9.700E-01	4.230E+00		
	EU 003	PER 002		2.390E+00	1.046E+01		
	EU 004	PER 001		2.570E+00	1.123E+01		
	EU 004	PER 002		6.340E+00	2.777E+01		
	EU 005	PER 001		3.320E+00	1.454E+01	5.000E-01	
	EU 005	PER 002		3.870E+00	9.700E-01	5.800E-01	
	EU 006	PER 001		3.320E+00	1.454E+01	5.000E-01	
	EU 006	PER 002		3.870E+00	9.700E-01	5.800E-01	
	EU 007	PER 001		3.730E+00	1.636E+01	5.600E-01	
	EU 007	PER 002		4.360E+00	1.090E+00	6.500E-01	
	EU 008	PER 001		3.730E+00	1.636E+01	5.600E-01	
	EU 008	PER 002		4.360E+00	1.090E+00	6.500E-01	
	EU 009	PER 001		4.980E+00	2.181E+01	7.500E-01	
	EU 009	PER 002		5.810E+00	1.450E+00	8.700E-01	
	EU 010	PER 001		1.740E+00	7.640E+00	2.600E-01	

## FACILITY DESCRIPTION: Potential-to-emit (by pollutant)

Show: Active and Pending Records

AQD Facility ID: 05300061

Facility Name: Abbott Northwestern Hospital

Pollutant	Item	Added By (Action)	Retired By (Action)	Hourly Potential (lbs per hr)	Unrestricted Potential (tons per yr)	Limited Potential (tons per yr)	Actual Emissions (tons per yr)
<b>Carbon Monoxide</b>							
	EU 010	PER 002		2.270E+00	5.700E-01	3.400E-01	
	EU 011	PER 001		7.200E-01	3.150E+00		
	EU 011	PER 002		7.200E-01	3.150E+00		
	EU 012	PER 001		7.200E-01	3.150E+00		
	EU 012	PER 002		7.200E-01	3.150E+00		
	EU 013	PER 001		7.200E-01	3.150E+00		
	EU 013	PER 002		7.200E-01	3.150E+00		
	EU 014	PER 001		7.200E-01	3.150E+00		
	EU 014	PER 002		7.200E-01	3.150E+00		
	EU 015	PER 001		5.890E+00	2.578E+01	8.800E-01	
	EU 015	PER 002		5.300E+00	1.320E+00	7.900E-01	
	EU 016	PER 001		5.890E+00	2.578E+01	8.800E-01	
	EU 016	PER 002		5.300E+00	1.320E+00	7.900E-01	
	EU 017	PER 001		5.890E+00	2.578E+01	8.800E-01	
	EU 017	PER 002		5.300E+00	1.320E+00	7.900E-01	
	EU 018	PER 001		9.500E-01	4.160E+00	1.400E-01	
	EU 018	PER 002		1.990E+00	5.000E-01	3.000E-01	
	EU 019	PER 002		3.400E-01	1.470E+00	1.470E+00	
	EU 020	PER 002		3.400E-01	1.470E+00	1.470E+00	
	EU 021	PER 002		2.500E-01	1.100E+00	1.100E+00	
	EU 022	PER 002		2.500E-01	1.100E+00	1.100E+00	
	EU 023	PER 002		2.500E-01	1.100E+00	1.100E+00	
	EU 024	PER 002		2.500E-01	1.100E+00	1.100E+00	
	EU 025	PER 002		1.400E-01	6.200E-01	6.200E-01	
	EU 026	PER 002		1.400E-01	6.200E-01	6.200E-01	
	EU 027	PER 002		3.450E+00	8.600E-01	5.200E-01	
	EU 028	PER 002		2.500E-01	1.100E+00	1.100E+00	
	GP 001	PER 002				2.394E+01	
	GP 003	PER 002				1.261E+01	
Totals					9.289E+01	5.309E+01	0.000E+00
<b>Cobalt compounds</b>							
	EU 001	PER 002		2.390E-06	1.050E-05		
	EU 002	PER 002		2.390E-06	1.050E-05		
	EU 003	PER 002		2.390E-06	1.050E-05		
	EU 004	PER 002		6.340E-06	2.780E-05		

## FACILITY DESCRIPTION: Potential-to-emit (by pollutant)

Show: Active and Pending Records

AQD Facility ID: 05300061

Facility Name: Abbott Northwestern Hospital

Pollutant	Item	Added By (Action)	Retired By (Action)	Hourly Potential (lbs per hr)	Unrestricted Potential (tons per yr)	Limited Potential (tons per yr)	Actual Emissions (tons per yr)
<b>Cobalt compounds</b>							
	EU 011	PER 002		7.200E-07	3.150E-06		
	EU 012	PER 002		7.200E-07	3.150E-06		
	EU 013	PER 002		7.200E-07	3.150E-06		
	EU 014	PER 002		7.200E-07	3.150E-06		
	EU 019	PER 002		3.360E-07	1.470E-06		
	EU 020	PER 002		3.360E-07	1.470E-06		
	EU 021	PER 002		2.520E-07	1.100E-06	1.100E-06	
	EU 022	PER 002		2.520E-07	1.100E-06	1.100E-06	
	EU 023	PER 002		2.520E-07	1.100E-06	1.100E-06	
	EU 024	PER 002		2.520E-07	1.100E-06	1.100E-06	
	EU 025	PER 002		1.410E-07	6.160E-07	6.160E-07	
	EU 026	PER 002		1.410E-07	6.160E-07	6.160E-07	
	EU 027	PER 002					
	EU 028	PER 002		2.520E-07	1.100E-06	1.100E-06	
	GP 001	PER 002				2.210E-05	
	GP 003	PER 002				1.260E-05	
<b>Totals</b>					8.157E-05	4.143E-05	0.000E+00
<b>Chromium compounds</b>							
	EU 001	PER 002		8.700E-05	3.810E-04		
	EU 002	PER 002		8.700E-05	3.810E-04		
	EU 003	PER 002		8.700E-05	3.810E-04		
	EU 004	PER 002		2.310E-04	1.010E-03		
	EU 011	PER 002		2.690E-05	1.180E-04		
	EU 012	PER 002		2.690E-05	1.180E-04		
	EU 013	PER 002		2.690E-05	1.180E-04		
	EU 014	PER 002		2.690E-05	1.180E-04		
	EU 019	PER 002		5.600E-06	2.450E-05	2.450E-05	
	EU 020	PER 002		5.600E-06	2.450E-05	2.450E-05	
	EU 021	PER 002		4.200E-06	1.840E-05	1.840E-05	
	EU 022	PER 002		4.200E-06	1.840E-05	1.840E-05	
	EU 023	PER 002		4.200E-06	1.840E-05	1.840E-05	
	EU 024	PER 002		4.200E-06	1.840E-05	1.840E-05	
	EU 025	PER 002		2.350E-06	1.030E-05	1.030E-05	
	EU 026	PER 002		2.350E-06	1.030E-05	1.030E-05	
	EU 027	PER 002					

## FACILITY DESCRIPTION: Potential-to-emit (by pollutant)

Show: Active and Pending Records

AQD Facility ID: 05300061

Facility Name: Abbott Northwestern Hospital

Pollutant	Item	Added By (Action)	Retired By (Action)	Hourly Potential (lbs per hr)	Unrestricted Potential (tons per yr)	Limited Potential (tons per yr)	Actual Emissions (tons per yr)
<b>Chromium compounds</b>							
	EU 028	PER 002		4.200E-06	1.840E-05	1.840E-05	
	GP 001	PER 002				5.260E-04	
	GP 003	PER 002				2.260E-04	
Totals					2.787E-03	9.136E-04	0.000E+00
<b>1,4-Dichlorobenzene</b>							
	EU 001	PER 002		3.410E-05	1.490E-04		
	EU 002	PER 002		3.410E-05	1.490E-04		
	EU 003	PER 002		3.410E-05	1.490E-04		
	EU 004	PER 002		9.060E-05	3.970E-04		
	EU 011	PER 002		1.030E-05	4.500E-05		
	EU 012	PER 002		1.030E-05	4.500E-05		
	EU 013	PER 002		1.030E-05	4.500E-05		
	EU 014	PER 002		1.030E-05	4.500E-05		
	EU 019	PER 002		4.800E-06	2.100E-05	2.100E-05	
	EU 020	PER 002		4.800E-06	2.100E-05	2.100E-05	
	EU 021	PER 002		3.600E-06	1.580E-05	1.580E-05	
	EU 022	PER 002		3.600E-06	1.580E-05	1.580E-05	
	EU 023	PER 002		3.600E-06	1.580E-05	1.580E-05	
	EU 024	PER 002		3.600E-06	1.580E-05	1.580E-05	
	EU 025	PER 002		2.010E-06	8.800E-06	8.800E-06	
	EU 026	PER 002		2.010E-06	8.800E-06	8.800E-06	
	EU 028	PER 002		3.600E-06	1.580E-05	1.580E-05	
	GP 001	PER 002				3.150E-04	
	GP 003	PER 002				1.800E-04	
Totals					1.163E-03	6.336E-04	0.000E+00
<b>Ethylbenzene</b>							
	EU 001	PER 002		1.320E-05	5.770E-05		
	EU 002	PER 002		1.320E-05	5.770E-05		
	EU 003	PER 002		1.320E-05	5.770E-05		
	EU 004	PER 002		3.500E-05	1.530E-04		
	EU 011	PER 002		4.070E-06	1.780E-05		
	EU 012	PER 002		4.070E-06	1.780E-05		
	EU 013	PER 002		4.070E-06	1.780E-05		
	EU 014	PER 002		4.070E-06	1.780E-05		
	GP 001	PER 002				2.400E-05	

## FACILITY DESCRIPTION: Potential-to-emit (by pollutant)

Show: Active and Pending Records

AQD Facility ID: 05300061

Facility Name: Abbott Northwestern Hospital

Pollutant	Item	Added By (Action)	Retired By (Action)	Hourly Potential (lbs per hr)	Unrestricted Potential (tons per yr)	Limited Potential (tons per yr)	Actual Emissions (tons per yr)
<b>Ethylbenzene</b>							
	GP 003	PER 002				4.360E-06	
Totals					3.973E-04	2.836E-05	0.000E+00
<b>Ethylene oxide</b>							
	EU 029	PER 002			5.000E-02	4.750E-05	
	EU 030	PER 002			5.000E-02	4.750E-05	
Totals					1.000E-01	9.500E-05	0.000E+00
<b>Formaldehyde</b>							
	EU 001	PER 002		6.840E-03	2.990E-02		
	EU 002	PER 002		6.840E-03	2.990E-02		
	EU 003	PER 002		6.840E-03	2.990E-02		
	EU 004	PER 002		1.820E-02	7.950E-02		
	EU 005	PER 002		3.590E-04	8.990E-05	5.390E-05	
	EU 006	PER 002		3.590E-04	8.990E-05	5.390E-05	
	EU 007	PER 002		4.040E-04	1.010E-04	6.070E-05	
	EU 008	PER 002		4.040E-04	1.770E-03	6.070E-05	
	EU 009	PER 002		5.390E-04	1.350E-04	8.090E-05	
	EU 010	PER 002		1.890E-04	4.720E-05	2.830E-05	
	EU 011	PER 002		2.110E-03	9.250E-03		
	EU 012	PER 002		2.110E-03	9.250E-03		
	EU 013	PER 002		2.110E-03	9.250E-03		
	EU 014	PER 002		2.110E-03	9.250E-03		
	EU 015	PER 002		4.920E-04	1.230E-04	7.370E-05	
	EU 016	PER 002		4.920E-04	1.230E-04	7.370E-05	
	EU 017	PER 002		4.920E-04	1.230E-04	7.370E-05	
	EU 018	PER 002		1.650E-04	4.140E-05	2.480E-05	
	EU 019	PER 002		3.000E-04	1.310E-03	1.310E-03	
	EU 020	PER 002		3.000E-04	1.310E-03	1.310E-03	
	EU 021	PER 002		2.250E-04	9.860E-04	9.860E-04	
	EU 022	PER 002		2.250E-04	9.860E-04	9.860E-04	
	EU 023	PER 002		2.250E-04	9.860E-04	9.860E-04	
	EU 024	PER 002		2.250E-04	9.860E-04	9.860E-04	
	EU 025	PER 002		1.260E-04	5.500E-04	5.500E-04	
	EU 026	PER 002		1.260E-04	5.500E-04	5.500E-04	
	EU 027	PER 002		1.520E-03	3.810E-04	2.290E-04	
	EU 028	PER 002		2.250E-04	9.860E-04	9.860E-04	



## FACILITY DESCRIPTION: Potential-to-emit (by pollutant)

Show: Active and Pending Records

AQD Facility ID: 05300061

Facility Name: Abbott Northwestern Hospital

Pollutant	Item	Added By (Action)	Retired By (Action)	Hourly Potential (lbs per hr)	Unrestricted Potential (tons per yr)	Limited Potential (tons per yr)	Actual Emissions (tons per yr)
<b>Formaldehyde</b>							
	GP 001	PER 002				3.210E-02	
	GP 003	PER 002				1.280E-02	
Totals					2.179E-01	5.436E-02	0.000E+00
<b>Hexane</b>							
	EU 001	PER 002		5.120E-02	2.240E-01		
	EU 002	PER 002		5.120E-02	2.240E-01		
	EU 003	PER 002		5.120E-02	2.240E-01		
	EU 004	PER 002		1.360E-01	5.950E-01		
	EU 011	PER 002		1.540E-02	6.760E-02		
	EU 012	PER 002		1.540E-02	6.760E-02		
	EU 013	PER 002		1.540E-02	6.760E-02		
	EU 014	PER 002		1.540E-02	6.760E-02		
	EU 019	PER 002		7.200E-03	3.150E-02	3.150E-02	
	EU 020	PER 002		7.200E-03	3.150E-02	3.150E-02	
	EU 021	PER 002		5.400E-03	2.370E-02	2.370E-02	
	EU 022	PER 002		5.400E-03	2.370E-02	2.370E-02	
	EU 023	PER 002		5.400E-03	2.370E-02	2.370E-02	
	EU 024	PER 002		5.400E-03	2.370E-02	2.370E-02	
	EU 025	PER 002		3.020E-03	1.320E-02	1.320E-02	
	EU 026	PER 002		3.020E-03	1.320E-02	1.320E-02	
	EU 027	PER 002		0.000E+00	0.000E+00	0.000E+00	
	EU 028	PER 002		5.400E-03	2.370E-02	2.370E-02	
	GP 001	PER 002				4.730E-01	
	GP 003	PER 002				2.700E-01	
Totals					1.745E+00	9.509E-01	0.000E+00
<b>Naphthalene</b>							
	EU 001	PER 002		2.340E-04	1.030E-03		
	EU 002	PER 002		2.340E-04	1.030E-03		
	EU 003	PER 002		2.340E-04	1.030E-03		
	EU 004	PER 002		6.220E-04	2.720E-03		
	EU 005	PER 002		5.920E-04	1.480E-04	8.880E-05	
	EU 006	PER 002		5.920E-04	1.480E-04	8.880E-05	
	EU 007	PER 002		6.660E-04	1.670E-04	9.990E-05	
	EU 008	PER 002		6.660E-04	1.670E-04	9.990E-05	
	EU 009	PER 002		8.880E-04	2.220E-04	1.330E-04	

## FACILITY DESCRIPTION: Potential-to-emit (by pollutant)

Show: Active and Pending Records

AQD Facility ID: 05300061

Facility Name: Abbott Northwestern Hospital

Pollutant	Item	Added By (Action)	Retired By (Action)	Hourly Potential (lbs per hr)	Unrestricted Potential (tons per yr)	Limited Potential (tons per yr)	Actual Emissions (tons per yr)
Naphthalene	EU 010	PER 002		3.110E-04	7.780E-05	4.670E-05	
	EU 011	PER 002		7.230E-05	3.170E-04		
	EU 012	PER 002		7.230E-05	3.170E-04		
	EU 013	PER 002		7.230E-05	3.170E-04		
	EU 014	PER 002		7.230E-05	3.170E-04		
	EU 015	PER 002		8.100E-04	2.020E-04	1.210E-04	
	EU 016	PER 002		8.100E-04	2.020E-04	1.210E-04	
	EU 017	PER 002		8.100E-04	2.020E-04	1.210E-04	
	EU 018	PER 002		2.730E-04	6.810E-05	4.090E-05	
	EU 019	PER 002		2.440E-06	1.070E-05	1.070E-05	
	EU 020	PER 002		2.440E-06	1.070E-05	1.070E-05	
	EU 021	PER 002		1.830E-06	8.020E-06	8.020E-06	
	EU 022	PER 002		1.830E-06	8.020E-06	8.020E-06	
	EU 023	PER 002		1.830E-06	8.020E-06	8.020E-06	
	EU 024	PER 002		1.830E-06	8.020E-06	8.020E-06	
	EU 025	PER 002		1.020E-06	4.480E-06	4.480E-06	
	EU 026	PER 002		1.020E-06	4.480E-06	4.480E-06	
	EU 027	PER 002		2.510E-03	6.280E-04	3.770E-04	
	EU 028	PER 002		1.830E-06	8.020E-06	8.020E-06	
	GP 001	PER 002				5.870E-04	
	GP 003	PER 002				1.630E-04	
Totals					9.380E-03	2.158E-03	0.000E+00
HAPs - Total							
	EU 001	PER 002			2.350E-01		
	EU 002	PER 002			2.350E-01		
	EU 003	PER 002			2.350E-01		
	EU 004	PER 002			6.240E-01		
	EU 005	PER 002			1.750E-03	1.050E-03	
	EU 006	PER 002			1.750E-03	1.050E-03	
	EU 007	PER 002			1.970E-03	1.180E-03	
	EU 008	PER 002			1.970E-03	1.180E-03	
	EU 009	PER 002			2.630E-03	1.580E-03	
	EU 010	PER 002			9.210E-04	5.530E-04	
	EU 011	PER 002			7.090E-02		
	EU 012	PER 002			7.090E-02		

## FACILITY DESCRIPTION: Potential-to-emit (by pollutant)

Show: Active and Pending Records

AQD Facility ID: 05300061

Facility Name: Abbott Northwestern Hospital

Pollutant	Item	Added By (Action)	Retired By (Action)	Hourly Potential (lbs per hr)	Unrestricted Potential (tons per yr)	Limited Potential (tons per yr)	Actual Emissions (tons per yr)
<b>HAPs - Total</b>							
	EU 013	PER 002			7.090E-02		
	EU 014	PER 002			7.090E-02		
	EU 015	PER 002			2.400E-03	1.440E-03	
	EU 016	PER 002			2.400E-03	1.440E-03	
	EU 017	PER 002			2.400E-03	1.440E-03	
	EU 018	PER 002			8.070E-04	4.850E-04	
	EU 019	PER 002			3.310E-02	3.310E-02	
	EU 020	PER 002			3.310E-02	3.310E-02	
	EU 021	PER 002			2.480E-02	2.480E-02	
	EU 022	PER 002			2.480E-02	2.480E-02	
	EU 023	PER 002			2.480E-02	2.480E-02	
	EU 024	PER 002			2.480E-02	2.480E-02	
	EU 025	PER 002			1.390E-02	1.390E-02	
	EU 026	PER 002			1.390E-02	1.390E-02	
	EU 027	PER 002			2.480E-02	2.480E-02	
	EU 028	PER 002			7.440E-03	4.460E-03	
	GP 001	PER 002				5.140E-01	
	GP 003	PER 002				2.840E-01	
<b>Totals</b>					1.857E+00	1.032E+00	0.000E+00
<b>Mercury Compounds</b>							
	EU 001	PER 002		8.700E-05	3.810E-04		
	EU 002	PER 002		8.700E-05	3.810E-04		
	EU 003	PER 002		8.700E-05	3.810E-04		
	EU 004	PER 002		2.310E-04	1.010E-03		
	EU 011	PER 002		2.690E-05	1.180E-04		
	EU 012	PER 002		2.690E-05	1.180E-04		
	EU 013	PER 002		2.690E-05	1.180E-04		
	EU 014	PER 002		2.690E-05	1.180E-04		
	EU 019	PER 002		1.040E-06	4.560E-06	4.560E-06	
	EU 020	PER 002		1.040E-06	4.560E-06	4.560E-06	
	EU 021	PER 002		7.800E-07	3.420E-06	3.420E-06	
	EU 022	PER 002		7.800E-07	3.420E-06	3.420E-06	
	EU 023	PER 002		7.800E-07	3.420E-06	3.420E-06	
	EU 024	PER 002		7.800E-07	3.420E-06	3.420E-06	
	EU 025	PER 002		4.360E-07	1.910E-06	1.910E-06	

## FACILITY DESCRIPTION: Potential-to-emit (by pollutant)

Show: Active and Pending Records

AQD Facility ID: 05300061

Facility Name: Abbott Northwestern Hospital

Pollutant	Item	Added By (Action)	Retired By (Action)	Hourly Potential (lbs per hr)	Unrestricted Potential (tons per yr)	Limited Potential (tons per yr)	Actual Emissions (tons per yr)
<b>Mercury Compounds</b>							
	EU 026	PER 002		4.360E-07	1.910E-06	1.910E-06	
	EU 027	PER 002					
	EU 028	PER 002		7.800E-07	3.420E-06	3.420E-06	
	GP 001	PER 002				2.270E-04	
	GP 003	PER 002				6.540E-05	
<b>Totals</b>					2.655E-03	3.224E-04	0.000E+00
<b>Toluene</b>							
	EU 001	PER 002		1.280E-03	5.630E-03		
	EU 002	PER 002		1.280E-03	5.630E-03		
	EU 003	PER 002		1.280E-03	5.630E-03		
	EU 004	PER 002		3.410E-03	1.490E-02		
	EU 005	PER 002		1.280E-03	3.200E-04	1.920E-04	
	EU 006	PER 002		1.280E-03	3.200E-04	1.920E-04	
	EU 007	PER 002		1.440E-03	3.600E-04	2.160E-04	
	EU 008	PER 002		1.440E-03	6.310E-03	2.160E-04	
	EU 009	PER 002		1.920E-03	4.800E-04	2.880E-04	
	EU 010	PER 002		6.720E-04	1.680E-04	1.010E-04	
	EU 011	PER 002		3.970E-04	1.740E-03		
	EU 012	PER 002		3.970E-04	1.740E-03		
	EU 013	PER 002		3.970E-04	1.740E-03		
	EU 014	PER 002		3.970E-04	1.740E-03		
	EU 015	PER 002		1.750E-03	4.380E-04	2.630E-04	
	EU 016	PER 002		1.750E-03	4.380E-04	2.630E-04	
	EU 017	PER 002		1.750E-03	4.380E-04	2.630E-04	
	EU 018	PER 002		5.890E-04	1.470E-04	8.840E-05	
	EU 019	PER 002		1.360E-05	5.960E-05	5.960E-05	
	EU 020	PER 002		1.360E-05	5.960E-05	5.960E-05	
	EU 021	PER 002		1.020E-05	4.470E-05	4.470E-05	
	EU 022	PER 002		1.020E-05	4.470E-05	4.470E-05	
	EU 023	PER 002		1.020E-05	4.470E-05	4.470E-05	
	EU 024	PER 002		1.020E-05	4.470E-05	4.470E-05	
	EU 025	PER 002		5.700E-06	2.490E-05	2.490E-05	
	EU 026	PER 002		5.700E-06	2.490E-05	2.490E-05	
	EU 027	PER 002		5.430E-03	1.360E-03	8.140E-04	
	EU 028	PER 002		1.020E-05	4.470E-05	4.470E-05	

## FACILITY DESCRIPTION: Potential-to-emit (by pollutant)

Show: Active and Pending Records

AQD Facility ID: 05300061

Facility Name: Abbott Northwestern Hospital

Pollutant	Item	Added By (Action)	Retired By (Action)	Hourly Potential (lbs per hr)	Unrestricted Potential (tons per yr)	Limited Potential (tons per yr)	Actual Emissions (tons per yr)
<b>Toluene</b>							
	GP 001	PER 002				3.230E-03	
	GP 003	PER 002				9.040E-04	
Totals					4.992E-02	7.423E-03	0.000E+00
<b>1,1,1-Trichloroethane</b>							
	EU 001	PER 002		4.890E-05	2.140E-04		
	EU 002	PER 002		4.890E-05	2.140E-04		
	EU 003	PER 002		4.890E-05	2.140E-04		
	EU 004	PER 002		1.300E-04	5.690E-04		
	EU 011	PER 002		1.510E-05	6.620E-05		
	EU 012	PER 002		1.510E-05	6.620E-05		
	EU 013	PER 002		1.510E-05	6.620E-05		
	EU 014	PER 002		1.510E-05	6.620E-05		
	GP 001	PER 002				8.910E-05	
	GP 003	PER 002				1.620E-05	
Totals					1.476E-03	1.053E-04	0.000E+00
<b>Xylenes (mixed isomers)</b>							
	EU 001	PER 002		2.260E-05	9.890E-05		
	EU 002	PER 002		2.260E-05	9.890E-05		
	EU 003	PER 002		2.260E-05	9.890E-05		
	EU 004	PER 002		6.000E-05	2.630E-04		
	EU 005	PER 002		8.790E-04	2.200E-04	1.320E-04	
	EU 006	PER 002		8.790E-04	2.200E-04	1.320E-04	
	EU 007	PER 002		9.890E-04	2.470E-04	1.480E-04	
	EU 008	PER 002		9.890E-04	2.470E-04	1.480E-04	
	EU 009	PER 002		1.320E-03	3.300E-04	1.980E-04	
	EU 010	PER 002		4.620E-04	1.150E-04	6.930E-05	
	EU 011	PER 002		6.980E-06	3.060E-05		
	EU 012	PER 002		6.980E-06	3.060E-05		
	EU 013	PER 002		6.980E-06	3.060E-05		
	EU 014	PER 002		6.980E-06	3.060E-05		
	EU 015	PER 002		1.200E-03	3.010E-04	1.800E-04	
	EU 016	PER 002		1.200E-03	3.010E-04	1.800E-04	
	EU 017	PER 002		1.200E-03	3.010E-04	1.800E-04	
	EU 018	PER 002		4.050E-04	1.010E-04	6.070E-05	
	EU 027	PER 002		3.730E-03	9.320E-04	5.590E-04	

## FACILITY DESCRIPTION: Potential-to-emit (by pollutant)

Show: Active and Pending Records

AQD Facility ID: 05300061

Facility Name: Abbott Northwestern Hospital

Pollutant	Item	Added By (Action)	Retired By (Action)	Hourly Potential (lbs per hr)	Unrestricted Potential (tons per yr)	Limited Potential (tons per yr)	Actual Emissions (tons per yr)
<b>Xylenes (mixed isomers)</b>							
	GP 001	PER 002				4.110E-05	
	GP 003	PER 002				7.470E-06	
Totals					3.997E-03	2.036E-03	0.000E+00
<b>7,12-Dimethylbenz(a)anthracene</b>							
	EU 001	PER 002		4.550E-07	1.990E-06		
	EU 002	PER 002		4.550E-07	1.990E-06		
	EU 003	PER 002		4.550E-07	1.990E-06		
	EU 004	PER 002		1.210E-06	5.290E-06		
	EU 011	PER 002		1.370E-07	6.010E-07		
	EU 012	PER 002		1.370E-07	6.010E-07		
	EU 013	PER 002		1.370E-07	6.010E-07		
	EU 014	PER 002		1.370E-07	6.010E-07		
	EU 019	PER 002		6.400E-08	2.800E-07	2.800E-07	
	EU 020	PER 002		6.400E-08	2.800E-07	2.800E-07	
	EU 021	PER 002		4.800E-08	2.100E-07	2.100E-07	
	EU 022	PER 002		4.800E-08	2.100E-07	2.100E-07	
	EU 023	PER 002		4.800E-08	2.100E-07	2.100E-07	
	EU 024	PER 002		4.800E-08	2.100E-07	2.100E-07	
	EU 025	PER 002		2.680E-08	1.170E-07	1.170E-07	
	EU 026	PER 002		2.680E-08	1.170E-07	1.170E-07	
	EU 028	PER 002		4.800E-08	2.100E-07	2.100E-07	
	GP 001	PER 002					4.200E-06
	GP 003	PER 002					2.400E-06
Totals					1.551E-05	1.844E-06	6.600E-06
<b>3-Methylchloranthrene</b>							
	EU 001	PER 002		5.120E-08	2.240E-07		
	EU 002	PER 002		5.120E-08	2.240E-07		
	EU 003	PER 002		5.120E-08	2.240E-07		
	EU 004	PER 002		1.360E-07	5.950E-07		
	EU 011	PER 002		1.540E-08	6.760E-08		
	EU 012	PER 002		1.540E-08	6.760E-08		
	EU 013	PER 002		1.540E-08	6.760E-08		
	EU 014	PER 002		1.540E-08	6.760E-08		
	EU 019	PER 002		7.200E-09	3.150E-08	3.150E-08	
	EU 020	PER 002		7.200E-09	3.150E-08	3.150E-08	

## FACILITY DESCRIPTION: Potential-to-emit (by pollutant)

Show: Active and Pending Records

AQD Facility ID: 05300061

Facility Name: Abbott Northwestern Hospital

Pollutant	Item	Added By (Action)	Retired By (Action)	Hourly Potential (lbs per hr)	Unrestricted Potential (tons per yr)	Limited Potential (tons per yr)	Actual Emissions (tons per yr)
<b>3-Methylchloranthrene</b>							
	EU 021	PER 002		5.400E-09	2.370E-08	2.370E-08	
	EU 022	PER 002		5.400E-09	2.370E-08	2.370E-08	
	EU 023	PER 002		5.400E-09	2.370E-08	2.370E-08	
	EU 024	PER 002		5.400E-09	2.370E-08	2.370E-08	
	EU 025	PER 002		3.020E-09	1.320E-08	1.320E-08	
	EU 026	PER 002		3.020E-09	1.320E-08	1.320E-08	
	EU 028	PER 002		5.400E-09	2.370E-08	2.370E-08	
	GP 001	PER 002					4.730E-07
	GP 003	PER 002					2.700E-07
Totals					1.745E-06	2.079E-07	7.430E-07
<b>2-Methylnaphthalene</b>							
	EU 001	PER 002		6.820E-07	2.990E-06		
	EU 002	PER 002		6.820E-07	2.990E-06		
	EU 003	PER 002		6.820E-07	2.990E-06		
	EU 004	PER 002		1.810E-06	7.940E-06		
	EU 011	PER 002		2.060E-07	9.010E-07		
	EU 012	PER 002		2.060E-07	9.010E-07		
	EU 013	PER 002		2.060E-07	9.010E-07		
	EU 014	PER 002		2.060E-07	9.010E-07		
	EU 019	PER 002		9.600E-08	4.200E-07	4.200E-07	
	EU 020	PER 002		9.600E-08	4.200E-07	4.200E-07	
	EU 021	PER 002		7.200E-08	3.150E-07	3.150E-07	
	EU 022	PER 002		7.200E-08	3.150E-07	3.150E-07	
	EU 023	PER 002		7.200E-08	3.150E-07	3.150E-07	
	EU 024	PER 002		7.200E-08	3.150E-07	3.150E-07	
	EU 025	PER 002		4.020E-08	1.760E-07	1.760E-07	
	EU 026	PER 002		4.020E-08	1.760E-07	1.760E-07	
	EU 028	PER 002		7.200E-08	3.150E-07	3.150E-07	
	GP 001	PER 002					6.300E-06
	GP 003	PER 002					3.600E-06
Totals					2.328E-05	2.767E-06	9.900E-06
<b>Manganese compounds</b>							
	EU 001	PER 002		1.740E-04	7.620E-04		
	EU 002	PER 002		1.740E-04	7.620E-04		
	EU 003	PER 002		1.740E-04	7.620E-04		

## FACILITY DESCRIPTION: Potential-to-emit (by pollutant)

Show: Active and Pending Records

AQD Facility ID: 05300061

Facility Name: Abbott Northwestern Hospital

Pollutant	Item	Added By (Action)	Retired By (Action)	Hourly Potential (lbs per hr)	Unrestricted Potential (tons per yr)	Limited Potential (tons per yr)	Actual Emissions (tons per yr)
<b>Manganese compounds</b>							
	EU 004	PER 002		4.620E-04	2.020E-03		
	EU 011	PER 002		5.380E-05	2.350E-04		
	EU 012	PER 002		5.380E-05	2.350E-04		
	EU 013	PER 002		5.380E-05	2.350E-04		
	EU 014	PER 002		5.380E-05	2.350E-04		
	EU 019	PER 002		1.520E-06	6.660E-06	6.660E-06	
	EU 020	PER 002		1.520E-06	6.660E-06	6.660E-06	
	EU 021	PER 002		1.140E-06	4.990E-06	4.990E-06	
	EU 022	PER 002		1.140E-06	4.990E-06	4.990E-06	
	EU 023	PER 002		1.140E-06	4.990E-06	4.990E-06	
	EU 024	PER 002		1.140E-06	4.990E-06	4.990E-06	
	EU 025	PER 002		6.370E-07	2.790E-06	2.790E-06	
	EU 026	PER 002		6.370E-07	2.790E-06	2.790E-06	
	EU 027	PER 002					
	EU 028	PER 002		1.140E-06	4.990E-06	4.990E-06	
	GP 001	PER 002				4.170E-04	
	GP 003	PER 002				1.110E-04	
Totals					5.290E-03	5.719E-04	0.000E+00
<b>Acenaphthene</b>							
	EU 001	PER 002		4.370E-06	1.910E-05		
	EU 002	PER 002		4.370E-06	1.910E-05		
	EU 003	PER 002		4.370E-06	1.910E-05		
	EU 004	PER 002		1.160E-05	5.080E-05		
	EU 005	PER 002		2.130E-05	5.330E-06	3.200E-06	
	EU 006	PER 002		2.130E-05	5.330E-06	3.200E-06	
	EU 007	PER 002		2.400E-05	6.000E-06	3.600E-06	
	EU 008	PER 002		2.400E-05	6.000E-06	3.600E-06	
	EU 009	PER 002		3.200E-05	8.000E-06	4.800E-06	
	EU 010	PER 002		1.120E-05	2.800E-06	1.680E-06	
	EU 011	PER 002		1.350E-06	5.910E-06		
	EU 012	PER 002		1.350E-06	5.910E-06		
	EU 013	PER 002		1.350E-06	5.910E-06		
	EU 014	PER 002		1.350E-06	5.910E-06		
	EU 015	PER 002		2.920E-05	7.290E-06	4.370E-06	
	EU 016	PER 002		2.920E-05	7.290E-06	4.370E-06	



## FACILITY DESCRIPTION: Potential-to-emit (by pollutant)

Show: Active and Pending Records

AQD Facility ID: 05300061

Facility Name: Abbott Northwestern Hospital

Pollutant	Item	Added By (Action)	Retired By (Action)	Hourly Potential (lbs per hr)	Unrestricted Potential (tons per yr)	Limited Potential (tons per yr)	Actual Emissions (tons per yr)
Acenaphthene	EU 017	PER 002		2.920E-05	7.290E-06	4.370E-06	
	EU 018	PER 002		9.810E-06	2.450E-06	1.470E-06	
	EU 019	PER 002		7.200E-09	3.150E-08	3.150E-08	
	EU 020	PER 002		7.200E-09	3.150E-08	3.150E-08	
	EU 021	PER 002		5.400E-09	2.370E-08	2.370E-08	
	EU 022	PER 002		5.400E-09	2.370E-08	2.370E-08	
	EU 023	PER 002		5.400E-09	2.370E-08	2.370E-08	
	EU 024	PER 002		5.400E-09	2.370E-08	2.370E-08	
	EU 025	PER 002		3.020E-09	1.320E-08	1.320E-08	
	EU 026	PER 002		3.020E-09	1.320E-08	1.320E-08	
	EU 027	PER 002		9.040E-05	2.260E-05	1.360E-05	
	EU 028	PER 002		5.400E-09	2.370E-08	2.370E-08	
	GP 001	PER 002				8.440E-06	
	GP 003	PER 002				1.700E-06	
Totals					2.123E-04	5.861E-05	0.000E+00
Acenaphthylene	EU 001	PER 002		5.240E-08	2.300E-07		
	EU 002	PER 002		5.240E-08	2.300E-07		
	EU 003	PER 002		5.240E-08	2.300E-07		
	EU 004	PER 002		1.390E-07	6.090E-07		
	EU 005	PER 002		4.200E-05	1.050E-05	6.310E-05	
	EU 006	PER 002		4.200E-05	1.050E-05	6.310E-05	
	EU 007	PER 002		4.730E-05	1.180E-05	7.100E-06	
	EU 008	PER 002		4.730E-05	1.180E-05	7.100E-06	
	EU 009	PER 002		6.310E-05	1.580E-05	9.460E-06	
	EU 010	PER 002		2.210E-05	5.520E-06	3.310E-06	
	EU 011	PER 002		1.620E-08	7.090E-08		
	EU 012	PER 002		1.620E-08	7.090E-08		
	EU 013	PER 002		1.620E-08	7.090E-08		
	EU 014	PER 002		1.620E-08	7.090E-08		
	EU 015	PER 002		5.750E-05	1.440E-05	8.630E-06	
	EU 016	PER 002		5.750E-05	1.440E-05	8.630E-06	
	EU 017	PER 002		5.750E-05	1.440E-05	8.630E-06	
	EU 018	PER 002		1.940E-05	4.840E-06	2.900E-06	
	EU 019	PER 002		7.200E-09	3.150E-08	3.150E-08	

## FACILITY DESCRIPTION: Potential-to-emit (by pollutant)

Show: Active and Pending Records

AQD Facility ID: 05300061

Facility Name: Abbott Northwestern Hospital

Pollutant	Item	Added By (Action)	Retired By (Action)	Hourly Potential (lbs per hr)	Unrestricted Potential (tons per yr)	Limited Potential (tons per yr)	Actual Emissions (tons per yr)
<b>Acenaphthylene</b>							
	EU 020	PER 002		7.200E-09	3.150E-08	3.150E-08	
	EU 021	PER 002		5.400E-09	2.370E-08	2.370E-08	
	EU 022	PER 002		5.400E-09	2.370E-08	2.370E-08	
	EU 023	PER 002		5.400E-09	2.370E-08	2.370E-08	
	EU 024	PER 002		5.400E-09	2.370E-08	2.370E-08	
	EU 025	PER 002		3.020E-09	1.320E-08	1.320E-08	
	EU 026	PER 002		3.020E-09	1.320E-08	1.320E-08	
	EU 027	PER 002		1.780E-04	4.460E-05	2.670E-05	
	EU 028	PER 002		5.400E-09	2.370E-08	2.370E-08	
	GP 001	PER 002				5.680E-07	
	GP 003	PER 002				2.710E-07	
Totals					1.604E-04	2.097E-04	0.000E+00
<b>Anthracene</b>							
	EU 001	PER 002		2.530E-07	1.110E-06		
	EU 002	PER 002		2.530E-07	1.110E-06		
	EU 003	PER 002		2.530E-07	1.110E-06		
	EU 004	PER 002		6.710E-07	2.940E-06		
	EU 005	PER 002		5.600E-06	1.400E-06	8.410E-07	
	EU 006	PER 002		5.600E-06	1.400E-06	8.410E-07	
	EU 007	PER 002		6.300E-06	1.580E-06	9.460E-07	
	EU 008	PER 002		6.300E-06	1.580E-06	9.460E-07	
	EU 009	PER 002		8.410E-06	2.100E-06	1.260E-06	
	EU 010	PER 002		2.940E-06	7.360E-07	4.410E-07	
	EU 011	PER 002		7.810E-08	3.420E-07		
	EU 012	PER 002		7.810E-08	3.420E-07		
	EU 013	PER 002		7.810E-08	3.420E-07		
	EU 014	PER 002		7.810E-08	3.420E-07		
	EU 015	PER 002		7.660E-06	1.920E-06	1.150E-06	
	EU 016	PER 002		7.660E-06	1.920E-06	1.150E-06	
	EU 017	PER 002		7.660E-06	1.920E-06	1.150E-06	
	EU 018	PER 002		2.580E-06	6.450E-07	3.870E-07	
	EU 019	PER 002		9.600E-09	4.200E-08	4.200E-08	
	EU 020	PER 002		9.600E-09	4.200E-08	4.200E-08	
	EU 021	PER 002		7.200E-09	3.150E-08	3.150E-08	
	EU 022	PER 002		7.200E-09	3.150E-08	3.150E-08	

## FACILITY DESCRIPTION: Potential-to-emit (by pollutant)

Show: Active and Pending Records

AQD Facility ID: 05300061

Facility Name: Abbott Northwestern Hospital

Pollutant	Item	Added By (Action)	Retired By (Action)	Hourly Potential (lbs per hr)	Unrestricted Potential (tons per yr)	Limited Potential (tons per yr)	Actual Emissions (tons per yr)
<b>Anthracene</b>	EU 023	PER 002		7.200E-09	3.150E-08	3.150E-08	
	EU 024	PER 002		7.200E-09	3.150E-08	3.150E-08	
	EU 025	PER 002		4.020E-09	1.760E-08	1.760E-08	
	EU 026	PER 002		4.020E-09	1.760E-08	1.760E-08	
	EU 027	PER 002		2.380E-05	5.940E-06	3.560E-06	
	EU 028	PER 002		7.200E-09	3.150E-08	3.150E-08	
	GP 001	PER 002				1.090E-06	
	GP 003	PER 002				4.220E-07	
<b>Totals</b>					2.906E-05	1.446E-05	0.000E+00
<b>Benz(a)anthracene</b>	EU 001	PER 002		8.310E-07	3.640E-06		
	EU 002	PER 002		8.310E-07	3.640E-06		
	EU 003	PER 002		8.310E-07	3.640E-06		
	EU 004	PER 002		2.210E-06	9.660E-06		
	EU 005	PER 002		2.830E-06	7.080E-07	4.250E-07	
	EU 006	PER 002		2.830E-06	7.080E-07	4.250E-07	
	EU 007	PER 002		3.190E-06	7.970E-07	4.780E-07	
	EU 008	PER 002		3.190E-06	7.970E-07	4.780E-07	
	EU 009	PER 002		4.250E-06	1.060E-06	6.380E-07	
	EU 010	PER 002		1.490E-06	3.720E-07	2.230E-07	
	EU 011	PER 002		1.490E-06	1.120E-06		
	EU 012	PER 002		2.570E-07	1.120E-06		
	EU 013	PER 002		2.570E-07	1.120E-06		
	EU 014	PER 002		2.570E-07	1.120E-06		
	EU 015	PER 002		3.880E-06	9.690E-07	5.810E-07	
	EU 016	PER 002		3.880E-06	9.690E-07	5.810E-07	
	EU 017	PER 002		3.880E-06	9.690E-07	5.810E-07	
	EU 018	PER 002		1.300E-06	3.260E-07	1.960E-07	
	EU 019	PER 002		7.200E-09	3.150E-08	3.150E-08	
	EU 020	PER 002		7.200E-09	3.150E-08	3.150E-08	
	EU 021	PER 002		5.400E-09	2.370E-08	2.370E-08	
	EU 022	PER 002		5.400E-09	2.370E-08	2.370E-08	
	EU 023	PER 002		5.400E-09	2.370E-08	2.370E-08	
	EU 024	PER 002		5.400E-09	2.370E-08	2.370E-08	
	EU 025	PER 002		3.020E-09	1.320E-08	1.320E-08	

## FACILITY DESCRIPTION: Potential-to-emit (by pollutant)

Show: Active and Pending Records

AQD Facility ID: 05300061

Facility Name: Abbott Northwestern Hospital

Pollutant	Item	Added By (Action)	Retired By (Action)	Hourly Potential (lbs per hr)	Unrestricted Potential (tons per yr)	Limited Potential (tons per yr)	Actual Emissions (tons per yr)
<b>Benz(a)anthracene</b>							
	EU 026	PER 002		3.020E-09	1.320E-08	1.320E-08	
	EU 027	PER 002		1.200E-05	3.000E-06	1.800E-06	
	EU 028	PER 002		5.400E-09	2.370E-08	2.370E-08	
	GP 001	PER 002				1.990E-06	
	GP 003	PER 002				5.280E-07	
<b>Totals</b>					3.594E-05	9.132E-06	0.000E+00
<b>Benzo(a)pyrene</b>							
	EU 001	PER 002		3.410E-08	1.490E-07		
	EU 002	PER 002		3.410E-08	1.490E-07		
	EU 003	PER 002		3.410E-08	1.490E-07		
	EU 004	PER 002		9.060E-08	3.970E-07		
	EU 005	PER 002		1.170E-06	1.760E-09	1.760E-07	
	EU 006	PER 002		1.170E-06	2.930E-07	1.760E-07	
	EU 007	PER 002		1.320E-06	3.290E-07	1.980E-07	
	EU 008	PER 002		1.320E-06	3.290E-07	1.980E-07	
	EU 009	PER 002		1.760E-06	4.390E-07	2.630E-07	
	EU 010	PER 002		6.150E-07	1.540E-07	9.220E-08	
	EU 011	PER 002		1.030E-08	4.500E-08		
	EU 012	PER 002		1.030E-08	4.500E-08		
	EU 013	PER 002		1.030E-08	4.500E-08		
	EU 014	PER 002		1.030E-08	4.500E-08		
	EU 015	PER 002		1.600E-06	4.000E-07	2.400E-07	
	EU 016	PER 002		1.600E-06	7.010E-06	2.400E-07	
	EU 017	PER 002		1.600E-06	7.010E-06	2.400E-07	
	EU 018	PER 002		5.390E-07	1.350E-07	8.080E-08	
	EU 019	PER 002		4.800E-09	2.100E-08	2.100E-08	
	EU 020	PER 002		4.800E-09	2.100E-08	2.100E-08	
	EU 021	PER 002		3.600E-09	1.580E-08	1.580E-08	
	EU 022	PER 002		3.600E-09	1.580E-08	1.580E-08	
	EU 023	PER 002		3.600E-09	1.580E-08	1.580E-08	
	EU 024	PER 002		3.600E-09	1.580E-08	1.580E-08	
	EU 025	PER 002		2.010E-09	8.800E-09	8.800E-09	
	EU 026	PER 002		2.010E-09	8.800E-09	8.800E-09	
	EU 027	PER 002		4.970E-06	1.240E-06	7.450E-07	
	EU 028	PER 002		3.600E-09	1.580E-08	1.580E-08	

## FACILITY DESCRIPTION: Potential-to-emit (by pollutant)

Show: Active and Pending Records

AQD Facility ID: 05300061

Facility Name: Abbott Northwestern Hospital

Pollutant	Item	Added By (Action)	Retired By (Action)	Hourly Potential (lbs per hr)	Unrestricted Potential (tons per yr)	Limited Potential (tons per yr)	Actual Emissions (tons per yr)
<b>Benzo(a)pyrene</b>							
	GP 001	PER 002				3.150E-07	
	GP 003	PER 002				1.800E-07	
Totals					1.850E-05	3.283E-06	0.000E+00
<b>Benzo(b)fluoranthene</b>							
	EU 001	PER 002		5.120E-08	2.240E-07		
	EU 002	PER 002		5.120E-08	2.240E-07		
	EU 003	PER 002		5.120E-08	2.240E-07		
	EU 004	PER 002		1.360E-07	5.950E-07		
	EU 005	PER 002		5.060E-06	1.260E-06	7.590E-07	
	EU 006	PER 002		5.060E-06	1.260E-06	7.590E-07	
	EU 007	PER 002		5.690E-06	1.420E-06	8.530E-07	
	EU 008	PER 002		5.690E-06	1.420E-06	8.530E-07	
	EU 009	PER 002		7.590E-06	1.900E-06	1.140E-06	
	EU 010	PER 002		2.660E-06	6.640E-07	3.980E-07	
	EU 011	PER 002		1.540E-08	6.760E-08		
	EU 012	PER 002		1.540E-08	6.760E-08		
	EU 013	PER 002		1.540E-08	6.760E-08		
	EU 014	PER 002		1.540E-08	6.760E-08		
	EU 015	PER 002		6.920E-06	1.730E-06	1.040E-06	
	EU 016	PER 002		6.920E-06	3.030E-05	1.040E-06	
	EU 017	PER 002		6.920E-06	3.030E-05	1.040E-06	
	EU 018	PER 002		2.330E-06	5.820E-07	3.490E-07	
	EU 019	PER 002		7.200E-09	3.150E-08	3.150E-08	
	EU 020	PER 002		7.200E-09	3.030E-05	3.150E-08	
	EU 021	PER 002		5.400E-09	2.370E-08	2.370E-08	
	EU 022	PER 002		5.400E-09	2.370E-08	2.370E-08	
	EU 023	PER 002		5.400E-09	2.370E-08	2.370E-08	
	EU 024	PER 002		5.400E-09	2.370E-08	2.370E-08	
	EU 025	PER 002		3.020E-09	1.320E-08	1.320E-08	
	EU 026	PER 002		3.020E-09	1.320E-08	1.320E-08	
	EU 027	PER 002		2.140E-05	5.360E-06	3.220E-06	
	EU 028	PER 002		5.400E-09	2.370E-08	2.370E-08	
	GP 001	PER 002				4.730E-07	
	GP 003	PER 002				2.700E-07	
Totals					1.082E-04	1.240E-05	0.000E+00

## FACILITY DESCRIPTION: Potential-to-emit (by pollutant)

Show: Active and Pending Records

AQD Facility ID: 05300061

Facility Name: Abbott Northwestern Hospital

Pollutant	Item	Added By (Action)	Retired By (Action)	Hourly Potential (lbs per hr)	Unrestricted Potential (tons per yr)	Limited Potential (tons per yr)	Actual Emissions (tons per yr)
<b>Benzo(ghi)perylene</b>	EU 001	PER 002		4.680E-07	2.050E-06		
	EU 002	PER 002		4.680E-07	2.050E-06		
	EU 003	PER 002		4.680E-07	2.050E-06		
	EU 004	PER 002		1.240E-06	5.440E-06		
	EU 005	PER 002		2.530E-06	6.330E-07	3.800E-07	
	EU 006	PER 002		2.530E-06	6.330E-07	3.800E-07	
	EU 007	PER 002		2.850E-06	7.120E-07	7.120E-07	
	EU 008	PER 002		2.850E-06	7.120E-07	4.270E-07	
	EU 009	PER 002		3.800E-06	9.500E-07	5.700E-07	
	EU 010	PER 002		1.330E-06	3.330E-07	2.000E-07	
	EU 011	PER 002		1.450E-07	6.340E-07		
	EU 012	PER 002		1.450E-07	6.340E-07		
	EU 013	PER 002		1.450E-07	6.340E-07		
	EU 014	PER 002		1.450E-07	6.340E-07		
	EU 015	PER 002		3.460E-06	8.660E-07	5.200E-07	
	EU 016	PER 002		3.460E-06	8.660E-07	5.200E-07	
	EU 017	PER 002		3.460E-06	8.660E-07	5.200E-07	
	EU 018	PER 002		1.170E-06	2.910E-07	1.750E-07	
	EU 019	PER 002		4.800E-09	2.100E-08	2.100E-08	
	EU 020	PER 002		4.800E-09	2.100E-08	2.100E-08	
	EU 021	PER 002		3.600E-09	1.580E-08	1.580E-08	
	EU 022	PER 002		3.600E-09	1.580E-08	1.580E-08	
	EU 023	PER 002		3.600E-09	1.580E-08	1.580E-08	
	EU 024	PER 002		3.600E-09	1.580E-08	1.580E-08	
	EU 025	PER 002		2.010E-09	8.800E-09	8.800E-09	
	EU 026	PER 002		2.010E-09	8.800E-09	8.800E-09	
	EU 027	PER 002		1.070E-05	2.690E-06	1.610E-06	
	EU 028	PER 002		3.600E-09	1.580E-08	1.580E-08	
	GP 001	PER 002				1.170E-06	
	GP 003	PER 002				3.240E-07	
Totals					2.382E-05	7.647E-06	0.000E+00
<b>Benzo(k)fluoranthene</b>	EU 001	PER 002		5.120E-08	2.240E-07		
	EU 002	PER 002		5.120E-08	2.240E-07		
	EU 003	PER 002		5.120E-08	2.240E-07		

## FACILITY DESCRIPTION: Potential-to-emit (by pollutant)

Show: Active and Pending Records

AQD Facility ID: 05300061

Facility Name: Abbott Northwestern Hospital

Pollutant	Item	Added By (Action)	Retired By (Action)	Hourly Potential (lbs per hr)	Unrestricted Potential (tons per yr)	Limited Potential (tons per yr)	Actual Emissions (tons per yr)
<b>Benzo(k)fluoranthene</b>	EU 004	PER 002		1.360E-07	5.950E-07		
	EU 005	PER 002		9.930E-07	1.490E-09	1.490E-07	
	EU 006	PER 002		9.930E-07	2.480E-07	1.490E-07	
	EU 007	PER 002		1.120E-06	4.890E-06	2.790E-07	
	EU 008	PER 002		1.120E-06	4.890E-06	1.680E-07	
	EU 009	PER 002		1.490E-06	3.720E-07	2.230E-07	
	EU 010	PER 002		5.220E-07	1.300E-07	7.820E-08	
	EU 011	PER 002		1.540E-08	6.760E-08		
	EU 012	PER 002		1.540E-08	6.760E-08		
	EU 013	PER 002		1.540E-08	6.760E-08		
	EU 014	PER 002		1.540E-08	6.760E-08		
	EU 015	PER 002		1.360E-06	3.400E-07	2.040E-07	
	EU 016	PER 002		1.360E-06	3.400E-07	2.040E-07	
	EU 017	PER 002		1.360E-06	3.400E-07	2.040E-07	
	EU 018	PER 002		4.570E-07	1.140E-07	6.860E-08	
	EU 019	PER 002		7.200E-09	3.150E-08	3.150E-08	
	EU 020	PER 002		7.200E-09	3.150E-08	3.150E-08	
	EU 021	PER 002		5.400E-09	2.370E-08	2.370E-08	
	EU 022	PER 002		5.400E-09	2.370E-08	2.370E-08	
	EU 023	PER 002		5.400E-09	2.370E-08	2.370E-08	
	EU 024	PER 002		5.400E-09	2.370E-08	2.370E-08	
	EU 025	PER 002		3.020E-09	1.320E-08	1.320E-08	
	EU 026	PER 002		3.020E-09	1.320E-08	1.320E-08	
	EU 027	PER 002		4.210E-06	1.050E-06	6.320E-07	
	EU 028	PER 002		5.400E-09	2.370E-08	2.370E-08	
	GP 001	PER 002				4.730E-07	
	GP 003	PER 002				2.700E-07	
Totals					1.446E-05	3.310E-06	0.000E+00
<b>Chrysene</b>	EU 001	PER 002		4.930E-07	2.160E-06		
	EU 002	PER 002		4.930E-07	2.160E-06		
	EU 003	PER 002		4.930E-07	2.160E-06		
	EU 004	PER 002		1.310E-06	5.730E-06		
	EU 005	PER 002		6.970E-06	1.740E-06	1.050E-06	
	EU 006	PER 002		6.970E-06	1.740E-06	1.050E-06	

## FACILITY DESCRIPTION: Potential-to-emit (by pollutant)

Show: Active and Pending Records

AQD Facility ID: 05300061

Facility Name: Abbott Northwestern Hospital

Pollutant	Item	Added By (Action)	Retired By (Action)	Hourly Potential (lbs per hr)	Unrestricted Potential (tons per yr)	Limited Potential (tons per yr)	Actual Emissions (tons per yr)
<b>Chrysene</b>							
	EU 007	PER 002		7.840E-06	1.960E-06	1.180E-06	
	EU 008	PER 002		7.840E-06	3.430E-05	1.180E-06	
	EU 009	PER 002		1.050E-05	2.610E-06	1.570E-06	
	EU 010	PER 002		3.660E-06	9.150E-07	5.490E-07	
	EU 011	PER 002		1.520E-07	6.670E-07		
	EU 012	PER 002		1.520E-07	6.670E-07		
	EU 013	PER 002		1.520E-07	6.670E-07		
	EU 014	PER 002		1.520E-07	6.670E-07		
	EU 015	PER 002		9.530E-06	1.430E-08	1.430E-06	
	EU 016	PER 002		9.530E-06	4.170E-05	1.430E-06	
	EU 017	PER 002		9.530E-06	4.170E-05	1.430E-06	
	EU 018	PER 002		3.210E-06	8.020E-07	4.810E-07	
	EU 019	PER 002		7.200E-09	3.150E-08	3.150E-08	
	EU 020	PER 002		7.200E-09	3.150E-08	3.150E-08	
	EU 021	PER 002		5.400E-09	2.370E-08	2.370E-08	
	EU 022	PER 002		5.400E-09	2.370E-08	2.370E-08	
	EU 023	PER 002		5.400E-09	2.370E-08	2.370E-08	
	EU 024	PER 002		5.400E-09	2.370E-08	2.370E-08	
	EU 025	PER 002		3.020E-09	1.320E-08	1.320E-08	
	EU 026	PER 002		3.020E-09	1.320E-08	1.320E-08	
	EU 027	PER 002		2.960E-05	7.390E-06	4.430E-06	
	EU 028	PER 002		5.400E-09	2.370E-08	2.370E-08	
	GP 001	PER 002				1.370E-06	
	GP 003	PER 002				4.170E-07	
<b>Totals</b>					1.500E-04	1.777E-05	0.000E+00
<b>Dibenz(a,h)anthracene</b>							
	EU 001	PER 002		3.460E-07	1.520E-06		
	EU 002	PER 002		3.460E-07	1.520E-06		
	EU 003	PER 002		3.460E-07	1.520E-06		
	EU 004	PER 002		9.190E-07	4.020E-06		
	EU 005	PER 002		1.580E-06	3.940E-07	2.360E-07	
	EU 006	PER 002		1.580E-06	3.940E-07	2.360E-07	
	EU 007	PER 002		1.770E-06	4.430E-07	2.660E-07	
	EU 008	PER 002		1.770E-06	7.770E-06	2.660E-07	
	EU 009	PER 002		2.360E-06	5.910E-07	3.550E-07	



## FACILITY DESCRIPTION: Potential-to-emit (by pollutant)

Show: Active and Pending Records

AQD Facility ID: 05300061

Facility Name: Abbott Northwestern Hospital

Pollutant	Item	Added By (Action)	Retired By (Action)	Hourly Potential (lbs per hr)	Unrestricted Potential (tons per yr)	Limited Potential (tons per yr)	Actual Emissions (tons per yr)
<b>Dibenz(a,h)anthracene</b>	EU 010	PER 002		8.280E-07	2.070E-07	1.240E-07	
	EU 011	PER 002		1.070E-07	4.680E-07		
	EU 012	PER 002		1.070E-07	4.680E-07		
	EU 013	PER 002		1.070E-07	4.680E-07		
	EU 014	PER 002		1.070E-07	4.680E-07		
	EU 015	PER 002		2.160E-06	5.390E-07	3.230E-07	
	EU 016	PER 002		2.160E-06	5.390E-07	3.230E-07	
	EU 017	PER 002		2.160E-06	5.390E-07	3.230E-07	
	EU 018	PER 002		7.250E-07	1.810E-07	1.090E-07	
	EU 019	PER 002		4.800E-09	2.100E-08	2.100E-08	
	EU 020	PER 002		4.800E-09	2.100E-08	2.100E-08	
	EU 021	PER 002		3.600E-09	1.580E-08	1.580E-08	
	EU 022	PER 002		3.600E-09	1.580E-08	1.580E-08	
	EU 023	PER 002		3.600E-09	1.580E-08	1.580E-08	
	EU 024	PER 002		3.600E-09	1.580E-08	1.580E-08	
	EU 025	PER 002		2.010E-09	8.800E-09	8.800E-09	
	EU 026	PER 002		2.010E-09	8.800E-09	8.800E-09	
	EU 027	PER 002		6.680E-06	1.670E-06	1.000E-06	
	EU 028	PER 002		3.600E-09	1.580E-08	1.580E-08	
	GP 001	PER 002				9.450E-07	
	GP 003	PER 002				2.840E-07	
<b>Totals</b>					2.386E-05	4.929E-06	0.000E+00
<b>Fluoranthene</b>	EU 001	PER 002		1.000E-06	4.390E-06		
	EU 002	PER 002		1.000E-06	4.390E-06		
	EU 003	PER 002		1.000E-06	4.390E-06		
	EU 004	PER 002		2.660E-06	1.170E-05		
	EU 005	PER 002		1.840E-05	4.590E-06	2.750E-06	
	EU 006	PER 002		1.840E-05	4.590E-06	2.750E-06	
	EU 007	PER 002		2.070E-05	5.160E-06	3.100E-06	
	EU 008	PER 002		2.070E-05	5.160E-06	3.100E-06	
	EU 009	PER 002		2.750E-05	6.880E-06	4.130E-06	
	EU 010	PER 002		9.640E-06	2.410E-06	1.450E-06	
	EU 011	PER 002		3.100E-07	1.360E-06		
	EU 012	PER 002		3.100E-07	1.360E-06		

## FACILITY DESCRIPTION: Potential-to-emit (by pollutant)

Show: Active and Pending Records

AQD Facility ID: 05300061

Facility Name: Abbott Northwestern Hospital

Pollutant	Item	Added By (Action)	Retired By (Action)	Hourly Potential (lbs per hr)	Unrestricted Potential (tons per yr)	Limited Potential (tons per yr)	Actual Emissions (tons per yr)
<b>Fluoranthene</b>	EU 013	PER 002		3.100E-07	1.360E-06		
	EU 014	PER 002		3.100E-07	1.360E-06		
	EU 015	PER 002		2.510E-05	6.280E-06	3.770E-06	
	EU 016	PER 002		2.510E-05	6.280E-06	3.770E-06	
	EU 017	PER 002		2.510E-05	6.280E-06	3.770E-06	
	EU 018	PER 002		8.450E-06	2.110E-06	1.270E-06	
	EU 019	PER 002		1.200E-08	5.260E-08	5.260E-08	
	EU 020	PER 002		1.200E-08	5.260E-08	5.260E-08	
	EU 021	PER 002		9.000E-09	3.940E-08	3.940E-08	
	EU 022	PER 002		9.000E-09	3.940E-08	3.940E-08	
	EU 023	PER 002		9.000E-09	3.940E-08	3.940E-08	
	EU 024	PER 002		9.000E-09	3.940E-08	3.940E-08	
	EU 025	PER 002		5.030E-09	2.200E-08	2.200E-08	
	EU 026	PER 002		5.030E-09	2.200E-08	2.200E-08	
	EU 027	PER 002		7.790E-05	1.950E-05	1.170E-05	
	EU 028	PER 002		9.000E-09	3.940E-08	3.940E-08	
	GP 001	PER 002				2.610E-06	
	GP 003	PER 002				7.550E-07	
<b>Totals</b>					9.990E-05	4.527E-05	0.000E+00
<b>Fluorene</b>	EU 001	PER 002		9.260E-07	4.060E-06		
	EU 002	PER 002		9.260E-07	4.060E-06		
	EU 003	PER 002		9.260E-07	4.060E-06		
	EU 004	PER 002		2.460E-06	1.080E-05		
	EU 005	PER 002		5.830E-05	1.460E-05	8.750E-06	
	EU 006	PER 002		5.830E-05	1.460E-05	8.750E-06	
	EU 007	PER 002		6.560E-05	1.640E-05	9.840E-06	
	EU 008	PER 002		6.560E-05	2.870E-04	9.840E-06	
	EU 009	PER 002		8.750E-05	2.190E-05	1.310E-05	
	EU 010	PER 002		3.060E-05	7.660E-06	4.590E-06	
	EU 011	PER 002		2.860E-07	1.250E-06		
	EU 012	PER 002		2.860E-07	1.250E-06		
	EU 013	PER 002		2.860E-07	1.250E-06		
	EU 014	PER 002		2.860E-07	1.250E-06		
	EU 015	PER 002		7.970E-05	1.990E-05	1.200E-05	

## FACILITY DESCRIPTION: Potential-to-emit (by pollutant)

Show: Active and Pending Records

AQD Facility ID: 05300061

Facility Name: Abbott Northwestern Hospital

Pollutant	Item	Added By (Action)	Retired By (Action)	Hourly Potential (lbs per hr)	Unrestricted Potential (tons per yr)	Limited Potential (tons per yr)	Actual Emissions (tons per yr)
Fluorene	EU 016	PER 002		7.970E-05	1.990E-05	1.200E-05	
	EU 017	PER 002		7.970E-05	1.990E-05	1.200E-05	
	EU 018	PER 002		2.680E-05	6.710E-06	4.030E-06	
	EU 019	PER 002		1.120E-05	4.910E-08	4.910E-08	
	EU 020	PER 002		1.120E-05	4.910E-08	4.910E-08	
	EU 021	PER 002		8.400E-09	3.680E-08	3.680E-08	
	EU 022	PER 002		8.400E-09	3.680E-08	3.680E-08	
	EU 023	PER 002		8.400E-09	3.680E-08	3.680E-08	
	EU 024	PER 002		8.400E-09	3.680E-08	3.680E-08	
	EU 025	PER 002		4.690E-09	2.050E-08	2.050E-08	
	EU 026	PER 002		4.690E-09	2.050E-08	2.050E-08	
	EU 027	PER 002		2.470E-04	6.180E-05	3.710E-05	
	EU 028	PER 002		8.400E-09	3.680E-08	3.680E-08	
	GP 001	PER 002				2.420E-06	
	GP 003	PER 002				7.010E-07	
Totals					5.187E-04	1.354E-04	0.000E+00
Indeno(1,2,3-cd)pyrene	EU 001	PER 002		4.430E-07	1.940E-06		
	EU 002	PER 002		4.430E-07	1.940E-06		
	EU 003	PER 002		4.430E-07	1.940E-06		
	EU 004	PER 002		1.180E-06	5.160E-06		
	EU 005	PER 002		1.890E-06	4.720E-07	2.830E-07	
	EU 006	PER 002		1.890E-06	2.830E-09	2.830E-07	
	EU 007	PER 002		2.120E-06	5.300E-07	3.180E-07	
	EU 008	PER 002		2.120E-06	9.290E-06	3.180E-07	
	EU 009	PER 002		2.830E-06	7.070E-07	4.240E-07	
	EU 010	PER 002		9.910E-07	2.480E-07	1.490E-07	
	EU 011	PER 002		1.370E-07	6.000E-07		
	EU 012	PER 002		1.370E-07	6.000E-07		
	EU 013	PER 002		1.370E-07	6.000E-07		
	EU 014	PER 002		1.370E-07	6.000E-07		
	EU 015	PER 002		2.580E-06	6.450E-07	3.870E-07	
	EU 016	PER 002		2.580E-06	6.450E-07	3.870E-07	
	EU 017	PER 002		2.580E-06	6.450E-07	3.870E-07	
	EU 018	PER 002		8.680E-07	2.170E-07	1.300E-07	

## FACILITY DESCRIPTION: Potential-to-emit (by pollutant)

Show: Active and Pending Records

AQD Facility ID: 05300061

Facility Name: Abbott Northwestern Hospital

Pollutant	Item	Added By (Action)	Retired By (Action)	Hourly Potential (lbs per hr)	Unrestricted Potential (tons per yr)	Limited Potential (tons per yr)	Actual Emissions (tons per yr)
<b>Indeno(1,2,3-cd)pyrene</b>							
	EU 019	PER 002		7.200E-09	3.150E-08	3.150E-08	
	EU 020	PER 002		7.200E-09	3.150E-08	3.150E-08	
	EU 021	PER 002		5.400E-09	2.370E-08	2.370E-08	
	EU 022	PER 002		5.400E-09	2.370E-08	2.370E-08	
	EU 023	PER 002		5.400E-09	2.370E-08	2.370E-08	
	EU 024	PER 002		5.400E-09	2.370E-08	2.370E-08	
	EU 025	PER 002		3.020E-09	1.320E-08	1.320E-08	
	EU 026	PER 002		3.020E-09	1.320E-08	1.320E-08	
	EU 027	PER 002		8.000E-06	2.000E-06	1.200E-06	
	EU 028	PER 002		5.400E-09	2.370E-08	2.370E-08	
	GP 001	PER 002				1.280E-06	
	GP 003	PER 002				4.000E-07	
Totals					2.899E-05	6.154E-06	0.000E+00
<b>Lead Compounds</b>							
	EU 001	PER 002		2.610E-04	1.140E-03		
	EU 002	PER 002		2.610E-04	1.140E-03		
	EU 003	PER 002		2.610E-04	1.140E-03		
	EU 004	PER 002		6.930E-04	3.040E-03		
	EU 011	PER 002		8.060E-05	3.530E-04		
	EU 012	PER 002		8.060E-05	3.530E-04		
	EU 013	PER 002		8.060E-05	3.530E-04		
	EU 014	PER 002		8.060E-05	3.530E-04		
	EU 019	PER 002		2.000E-06	8.760E-06	8.760E-06	
	EU 020	PER 002		2.000E-06	8.760E-06	8.760E-06	
	EU 021	PER 002		1.500E-06	6.570E-06	6.570E-06	
	EU 022	PER 002		1.500E-06	6.570E-06	6.570E-06	
	EU 023	PER 002		1.500E-06	6.570E-06	6.570E-06	
	EU 024	PER 002		1.500E-06	6.570E-06	6.570E-06	
	EU 025	PER 002		8.380E-07	3.670E-06	3.670E-06	
	EU 026	PER 002		8.380E-07	3.670E-06	3.670E-06	
	EU 027	PER 002					
	EU 028	PER 002		1.500E-06	6.570E-06	6.570E-06	
	GP 001	PER 002				6.070E-04	
	GP 003	PER 002				1.570E-04	
Totals					7.930E-03	8.217E-04	0.000E+00

## FACILITY DESCRIPTION: Potential-to-emit (by pollutant)

Show: Active and Pending Records

AQD Facility ID: 05300061

Facility Name: Abbott Northwestern Hospital

Pollutant	Item	Added By (Action)	Retired By (Action)	Hourly Potential (lbs per hr)	Unrestricted Potential (tons per yr)	Limited Potential (tons per yr)	Actual Emissions (tons per yr)
Phenanthrene	EU 001	PER 002		2.180E-06	9.530E-06		
	EU 002	PER 002		2.180E-06	9.530E-06		
	EU 003	PER 002		2.180E-06	9.530E-06		
	EU 004	PER 002		5.780E-06	2.530E-05		
	EU 005	PER 002		1.860E-04	4.650E-05	2.790E-05	
	EU 006	PER 002		1.860E-04	4.650E-05	2.790E-05	
	EU 007	PER 002		2.090E-04	5.230E-05	3.140E-05	
	EU 008	PER 002		2.090E-04	5.230E-05	3.140E-05	
	EU 009	PER 002		2.790E-04	6.970E-05	4.180E-05	
	EU 010	PER 002		9.760E-05	2.440E-05	1.460E-05	
	EU 011	PER 002		6.720E-07	2.940E-06		
	EU 012	PER 002		6.720E-07	2.940E-06		
	EU 013	PER 002		6.720E-07	2.940E-06		
	EU 014	PER 002		6.720E-07	2.940E-06		
	EU 015	PER 002		2.540E-04	6.350E-05	3.810E-05	
	EU 016	PER 002		2.540E-04	6.350E-05	3.810E-05	
	EU 017	PER 002		2.540E-04	6.350E-05	3.810E-05	
	EU 018	PER 002		8.550E-05	2.140E-05	1.280E-05	
	EU 019	PER 002		6.800E-08	2.980E-07	2.980E-07	
	EU 020	PER 002		6.800E-08	2.980E-07	2.980E-07	
	EU 021	PER 002		5.100E-08	2.230E-07	2.230E-07	
	EU 022	PER 002		5.100E-08	2.230E-07	2.230E-07	
	EU 023	PER 002		5.100E-08	2.230E-07	2.230E-07	
	EU 024	PER 002		5.100E-08	2.230E-07	2.230E-07	
	EU 025	PER 002		2.850E-08	1.250E-07	1.250E-07	
	EU 026	PER 002		2.850E-08	1.250E-07	1.250E-07	
	EU 027	PER 002		7.880E-04	1.970E-04	1.800E-04	
	EU 028	PER 002		5.100E-08	2.230E-07	2.230E-07	
	GP 001	PER 002				8.430E-06	
	GP 003	PER 002				3.120E-06	
Totals					7.682E-04	4.956E-04	0.000E+00
Pyrene	EU 001	PER 002		1.420E-06	6.230E-06		
	EU 002	PER 002		1.420E-06	6.230E-06		
	EU 003	PER 002		1.420E-06	6.230E-06		

## FACILITY DESCRIPTION: Potential-to-emit (by pollutant)

Show: Active and Pending Records

AQD Facility ID: 05300061

Facility Name: Abbott Northwestern Hospital

Pollutant	Item	Added By (Action)	Retired By (Action)	Hourly Potential (lbs per hr)	Unrestricted Potential (tons per yr)	Limited Potential (tons per yr)	Actual Emissions (tons per yr)
<b>Pyrene</b>	EU 004	PER 002		3.770E-06	1.650E-05		
	EU 005	PER 002		1.690E-05	4.230E-06	2.540E-06	
	EU 006	PER 002		1.690E-05	2.540E-08	2.540E-06	
	EU 007	PER 002		1.900E-05	4.750E-06	2.850E-06	
	EU 008	PER 002		1.900E-05	4.750E-06	2.850E-06	
	EU 009	PER 002		2.540E-05	6.340E-06	3.800E-06	
	EU 010	PER 002		8.880E-06	2.220E-06	1.330E-06	
	EU 011	PER 002		4.290E-07	1.880E-06		
	EU 012	PER 002		4.290E-07	1.880E-06		
	EU 013	PER 002		4.290E-07	1.880E-06		
	EU 014	PER 002		4.290E-07	1.880E-06		
	EU 015	PER 002		2.310E-05	5.780E-06	3.470E-06	
	EU 016	PER 002		2.310E-05	5.780E-06	3.470E-06	
	EU 017	PER 002		2.310E-05	5.780E-06	3.470E-06	
	EU 018	PER 002		7.780E-06	1.940E-06	1.170E-06	
	EU 019	PER 002		2.000E-07	8.760E-07	8.760E-07	
	EU 020	PER 002		2.000E-07	8.760E-07	8.760E-07	
	EU 021	PER 002		1.500E-07	6.570E-07	6.570E-07	
	EU 022	PER 002		1.500E-07	6.570E-07	6.570E-07	
	EU 023	PER 002		1.500E-07	6.570E-07	6.570E-07	
	EU 024	PER 002		1.500E-07	6.570E-07	6.570E-07	
	EU 025	PER 002		8.380E-08	3.670E-07	3.670E-07	
	EU 026	PER 002		8.380E-08	3.670E-07	3.670E-07	
	EU 027	PER 002		7.170E-05	1.790E-05	1.080E-05	
	EU 028	PER 002		1.500E-07	6.570E-07	6.570E-07	
	GP 001	PER 002				1.470E-05	
	GP 003	PER 002				7.510E-06	
Totals					1.080E-04	6.627E-05	0.000E+00
<b>Nickel compounds</b>	EU 001	PER 002		8.700E-05	3.810E-04		
	EU 002	PER 002		8.700E-05	3.810E-04		
	EU 003	PER 002		8.700E-05	3.810E-04		
	EU 004	PER 002		2.310E-04	1.010E-03		
	EU 011	PER 002		2.690E-05	1.180E-04		
	EU 012	PER 002		2.690E-05	1.180E-04		

## FACILITY DESCRIPTION: Potential-to-emit (by pollutant)

Show: Active and Pending Records

AQD Facility ID: 05300061

Facility Name: Abbott Northwestern Hospital

Pollutant	Item	Added By (Action)	Retired By (Action)	Hourly Potential (lbs per hr)	Unrestricted Potential (tons per yr)	Limited Potential (tons per yr)	Actual Emissions (tons per yr)
<b>Nickel compounds</b>							
	EU 013	PER 002		2.690E-05	1.180E-04		
	EU 014	PER 002		2.690E-05	1.180E-04		
	EU 019	PER 002		8.400E-06	3.680E-05	3.680E-05	
	EU 020	PER 002		8.400E-06	3.680E-05	3.680E-05	
	EU 021	PER 002		6.300E-06	2.760E-05	2.760E-05	
	EU 022	PER 002		6.300E-06	2.760E-05	2.760E-05	
	EU 023	PER 002		6.300E-06	2.760E-05	2.760E-05	
	EU 024	PER 002		6.300E-06	2.760E-05	2.760E-05	
	EU 025	PER 002			1.540E-05	1.540E-05	
	EU 026	PER 002			1.540E-05	1.540E-05	
	EU 027	PER 002					
	EU 028	PER 002		6.300E-06	2.760E-05	2.760E-05	
	GP 001	PER 002				7.100E-04	
	GP 003	PER 002				3.250E-04	
Totals					2.867E-03	1.277E-03	0.000E+00
<b>Nitrogen Oxides</b>							
	EU 001	PER 001		1.062E+01	4.649E+01		
	EU 001	PER 002		4.140E+00	1.815E+01		
	EU 002	PER 001		1.062E+01	4.649E+01		
	EU 002	PER 002		4.140E+00	1.815E+01		
	EU 003	PER 001		1.062E+01	4.649E+01		
	EU 003	PER 002		4.140E+00	1.815E+01		
	EU 004	PER 001		2.822E+01	1.236E+02		
	EU 004	PER 002		1.100E+01	4.818E+01		
	EU 005	PER 001		1.526E+01	6.684E+01	2.290E+00	
	EU 005	PER 002		1.458E+01	3.640E+00	2.190E+00	
	EU 006	PER 001		1.526E+01	6.684E+01	2.290E+00	
	EU 006	PER 002		1.458E+01	3.640E+00	2.190E+00	
	EU 007	PER 001		1.717E+01	7.520E+01	2.580E+00	
	EU 007	PER 002		1.640E+01	4.100E+00	2.460E+00	
	EU 008	PER 001		1.717E+01	7.520E+01	2.580E+00	
	EU 008	PER 002		1.640E+01	4.100E+00	2.460E+00	
	EU 009	PER 001		2.289E+01	1.003E+02	3.430E+00	
	EU 009	PER 002		2.187E+01	5.470E+00	3.280E+00	
	EU 010	PER 001		8.020E+00	3.511E+01	1.200E+00	

## FACILITY DESCRIPTION: Potential-to-emit (by pollutant)

Show: Active and Pending Records

AQD Facility ID: 05300061

Facility Name: Abbott Northwestern Hospital

Pollutant	Item	Added By (Action)	Retired By (Action)	Hourly Potential (lbs per hr)	Unrestricted Potential (tons per yr)	Limited Potential (tons per yr)	Actual Emissions (tons per yr)
<b>Nitrogen Oxides</b>							
	EU 010	PER 002		1.055E+01	2.640E+00	1.580E+00	
	EU 011	PER 001		1.290E+00	5.630E+00		
	EU 011	PER 002		1.280E+00	5.610E+00		
	EU 012	PER 001		1.290E+00	5.630E+00		
	EU 012	PER 002		1.280E+00	5.610E+00		
	EU 013	PER 001		1.290E+00	5.630E+00		
	EU 013	PER 002		1.280E+00	5.610E+00		
	EU 014	PER 001		1.290E+00	5.630E+00		
	EU 014	PER 002		1.280E+00	5.610E+00		
	EU 015	PER 001		2.568E+01	1.125E+02	3.850E+00	
	EU 015	PER 002		1.994E+01	4.980E+00	2.990E+00	
	EU 016	PER 001		2.568E+01	1.125E+02	3.850E+00	
	EU 016	PER 002		1.994E+01	4.980E+00	2.990E+00	
	EU 017	PER 001		2.568E+01	1.125E+02	3.850E+00	
	EU 017	PER 002		1.994E+01	4.980E+00	2.990E+00	
	EU 018	PER 001		4.290E+00	1.879E+01	6.400E-01	
	EU 018	PER 002		9.250E+00	2.310E+00	1.390E+00	
	EU 019	PER 002		4.000E-01	1.750E+00	1.750E+00	
	EU 020	PER 002		4.000E-01	1.750E+00	1.750E+00	
	EU 021	PER 002		3.000E-01	1.310E+00	1.310E+00	
	EU 022	PER 002		3.000E-01	1.310E+00	1.310E+00	
	EU 023	PER 002		3.000E-01	1.310E+00	1.310E+00	
	EU 024	PER 002		3.000E-01	1.310E+00	1.310E+00	
	EU 025	PER 002		1.700E-01	7.300E-01	7.300E-01	
	EU 026	PER 002		1.700E-01	7.300E-01	7.300E-01	
	EU 027	PER 002		4.210E+01	1.053E+01	6.320E+00	
	EU 028	PER 002		3.000E-01	1.310E+00	1.310E+00	
	GP 001	PER 002				3.380E+01	
	GP 003	PER 002				1.547E+01	
Totals					1.880E+02	9.162E+01	0.000E+00
<b>Octachloridibenzo-p-dioxin (OC)</b>							
	EU 001	PER 002		6.420E-10	2.810E-09		
	EU 002	PER 002		6.420E-10	2.810E-09		
	EU 003	PER 002		6.420E-10	2.810E-09		
	EU 004	PER 002		1.710E-09	7.470E-09		



## FACILITY DESCRIPTION: Potential-to-emit (by pollutant)

Show: Active and Pending Records

AQD Facility ID: 05300061

Facility Name: Abbott Northwestern Hospital

Pollutant	Item	Added By (Action)	Retired By (Action)	Hourly Potential (lbs per hr)	Unrestricted Potential (tons per yr)	Limited Potential (tons per yr)	Actual Emissions (tons per yr)
<b>Octachloridibenzo-p-dioxin (OC)</b>							
	EU 011	PER 002		1.980E-10	8.690E-10	8.690E-10	
	EU 012	PER 002		1.980E-10	8.690E-10	8.690E-10	
	EU 013	PER 002		1.980E-10	8.690E-10	8.690E-10	
	EU 014	PER 002		1.980E-10	8.690E-10	8.690E-10	
	GP 001	PER 002					1.170E-09
	GP 003	PER 002					2.120E-10
Totals					1.938E-08	3.476E-09	1.382E-09
<b>PM &lt; 2.5 micron</b>							
	EU 001	PER 002		3.200E-01	1.410E+00		
	EU 002	PER 002		3.200E-01	1.410E+00		
	EU 003	PER 002		3.200E-01	1.410E+00		
	EU 004	PER 002		8.500E-01	3.730E+00		
	EU 005	PER 002		2.500E-01	6.000E-02	4.000E-02	
	EU 006	PER 002		2.500E-01	6.000E-02	4.000E-02	
	EU 007	PER 002		2.800E-01	7.000E-02	4.000E-02	
	EU 008	PER 002		2.800E-01	7.000E-02	4.000E-02	
	EU 009	PER 002		3.800E-01	9.000E-02	6.000E-02	
	EU 010	PER 002		7.400E-01	1.900E-01	1.100E-01	
	EU 011	PER 002		1.000E-01	4.300E-01		
	EU 012	PER 002		1.000E-01	4.300E-01		
	EU 013	PER 002		1.000E-01	4.300E-01		
	EU 014	PER 002		1.000E-01	4.300E-01		
	EU 015	PER 002		3.500E-01	9.000E-02	5.000E-02	
	EU 016	PER 002		3.500E-01	9.000E-02	5.000E-02	
	EU 017	PER 002		3.500E-01	9.000E-02	5.000E-02	
	EU 018	PER 002		6.500E-01	1.600E-01	1.000E-01	
	EU 019	PER 002		3.000E-02	1.300E-01	1.300E-01	
	EU 020	PER 002		3.000E-02	1.300E-01	1.300E-01	
	EU 021	PER 002		2.000E-02	1.000E-01	1.000E-01	
	EU 022	PER 002		2.000E-02	1.000E-01	1.000E-01	
	EU 023	PER 002		2.000E-02	1.000E-01	1.000E-01	
	EU 024	PER 002		2.000E-02	1.000E-01	1.000E-01	
	EU 025	PER 002		1.000E-02	6.000E-02	6.000E-02	
	EU 026	PER 002		1.000E-02	6.000E-02	6.000E-02	
	EU 027	PER 002		2.300E-01	6.000E-02	3.000E-02	

## FACILITY DESCRIPTION: Potential-to-emit (by pollutant)

Show: Active and Pending Records

AQD Facility ID: 05300061

Facility Name: Abbott Northwestern Hospital

Pollutant	Item	Added By (Action)	Retired By (Action)	Hourly Potential (lbs per hr)	Unrestricted Potential (tons per yr)	Limited Potential (tons per yr)	Actual Emissions (tons per yr)
<b>PM &lt; 2.5 micron</b>							
	EU 028	PER 002		2.000E-02	1.000E-01	1.000E-01	
	GP 001	PER 002				2.580E+00	
	GP 003	PER 002				1.180E+00	
Totals					1.159E+01	5.250E+00	0.000E+00
<b>Lead</b>							
	EU 001	PER 001		3.000E-04	1.300E-03		
	EU 002	PER 001		3.000E-04	1.300E-03		
	EU 003	PER 001		3.000E-04	1.300E-03		
	EU 004	PER 001		8.000E-04	3.400E-03		
	EU 011	PER 001		1.000E-04	4.000E-04		
	EU 012	PER 001		1.000E-04	4.000E-04		
	EU 013	PER 001		1.000E-04	4.000E-04		
	EU 014	PER 001		1.000E-04	4.000E-04		
Totals					8.900E-03	0.000E+00	0.000E+00
<b>PM &lt; 10 micron</b>							
	EU 001	PER 001		2.840E+00	1.243E+01		
	EU 001	PER 002		4.800E-01	2.090E+00		
	EU 002	PER 001		2.840E+00	1.243E+01		
	EU 002	PER 002		4.800E-01	2.090E+00		
	EU 003	PER 001		2.840E+00	1.243E+01		
	EU 003	PER 002		4.800E-01	2.090E+00		
	EU 004	PER 001		7.540E+00	3.303E+01		
	EU 004	PER 002		1.270E+00	5.540E+00		
	EU 005	PER 001		1.040E+00	4.560E+00	1.600E-01	
	EU 005	PER 002		2.600E-01	7.000E-02	4.000E-02	
	EU 006	PER 001		1.040E+00	4.560E+00	1.600E-01	
	EU 006	PER 002		2.600E-01	7.000E-02	4.000E-02	
	EU 007	PER 001		1.170E+00	5.130E+00	1.800E-01	
	EU 007	PER 002		2.900E-01	7.000E-02	4.000E-02	
	EU 008	PER 001		1.170E+00	5.130E+00	1.800E-01	
	EU 008	PER 002		2.900E-01	7.000E-02	4.000E-02	
	EU 009	PER 001		1.560E+00	6.840E+00	2.300E-01	
	EU 009	PER 002		3.900E-01	1.000E-01	6.000E-02	
	EU 010	PER 001		5.500E-01	2.400E+00	8.000E-02	
	EU 010	PER 002		7.400E-01	1.900E-01	1.100E-01	

## FACILITY DESCRIPTION: Potential-to-emit (by pollutant)

Show: Active and Pending Records

AQD Facility ID: 05300061

Facility Name: Abbott Northwestern Hospital

Pollutant	Item	Added By (Action)	Retired By (Action)	Hourly Potential (lbs per hr)	Unrestricted Potential (tons per yr)	Limited Potential (tons per yr)	Actual Emissions (tons per yr)
PM < 10 micron	EU 011	PER 001		6.000E-02	2.800E-01		
	EU 011	PER 002		1.500E-01	6.400E-01		
	EU 012	PER 001		6.000E-02	2.800E-01		
	EU 012	PER 002		1.500E-01	6.400E-01		
	EU 013	PER 001		6.000E-02	2.800E-01		
	EU 013	PER 002		1.500E-01	6.400E-01		
	EU 014	PER 001		6.000E-02	2.800E-01		
	EU 014	PER 002		1.500E-01	6.400E-01		
	EU 015	PER 001		7.500E-01	3.280E+00	1.100E-01	
	EU 015	PER 002		3.600E-01	9.000E-02	5.000E-02	
	EU 016	PER 001		7.500E-01	3.280E+00	1.100E-01	
	EU 016	PER 002		3.600E-01	9.000E-02	5.000E-02	
	EU 017	PER 001		7.500E-01	3.280E+00	1.100E-01	
	EU 017	PER 002		3.600E-01	9.000E-02	5.000E-02	
	EU 018	PER 001		1.100E-01	4.800E-01	2.000E-02	
	EU 018	PER 002		6.500E-01	1.600E-01	1.000E-01	
	EU 019	PER 002		3.000E-02	1.300E-01	1.300E-01	
	EU 020	PER 002		3.000E-02	1.300E-01	1.300E-01	
	EU 021	PER 002		2.000E-02	1.000E-01	1.000E-01	
	EU 022	PER 002		2.000E-02	1.000E-01	1.000E-01	
	EU 023	PER 002		2.000E-02	1.000E-01	1.000E-01	
	EU 024	PER 002		2.000E-02	1.000E-01	1.000E-01	
	EU 025	PER 002		1.000E-02	6.000E-02	6.000E-02	
	EU 026	PER 002		1.000E-02	6.000E-02	6.000E-02	
	EU 027	PER 002		2.300E-01	6.000E-02	3.000E-02	
	EU 028	PER 002		2.000E-02	1.000E-01	1.000E-01	
	GP 001	PER 002				2.860E+00	
	GP 003	PER 002				1.230E+00	
Totals					1.631E+01	5.580E+00	0.000E+00
Total Particulate Matter							
	EU 001	PER 001		3.290E+00	1.441E+01		
	EU 001	PER 002		6.800E-01	2.990E+00		
	EU 002	PER 001		3.290E+00	1.441E+01		
	EU 002	PER 002		6.800E-01	2.990E+00		
	EU 003	PER 001		3.290E+00	1.441E+01		

## FACILITY DESCRIPTION: Potential-to-emit (by pollutant)

Show: Active and Pending Records

AQD Facility ID: 05300061

Facility Name: Abbott Northwestern Hospital

Pollutant	Item	Added By (Action)	Retired By (Action)	Hourly Potential (lbs per hr)	Unrestricted Potential (tons per yr)	Limited Potential (tons per yr)	Actual Emissions (tons per yr)
<b>Total Particulate Matter</b>							
	EU 003	PER 002		6.800E-01	2.990E+00		
	EU 004	PER 001		8.750E+00	3.831E+01		
	EU 004	PER 002		1.820E+00	7.950E+00		
	EU 005	PER 001		1.090E+00	4.770E+00	1.600E-01	
	EU 005	PER 002		3.200E-01	8.000E-02	5.000E-02	
	EU 006	PER 001		1.090E+00	4.770E+00	1.600E-01	
	EU 006	PER 002		3.200E-01	8.000E-02	5.000E-02	
	EU 007	PER 001		1.230E+00	5.370E+00	1.800E-01	
	EU 007	PER 002		3.600E-01	9.000E-02	5.000E-02	
	EU 008	PER 001		1.230E+00	5.370E+00	1.800E-01	
	EU 008	PER 002		3.600E-01	9.000E-02	5.000E-02	
	EU 009	PER 001		1.640E+00	7.160E+00	2.500E-01	
	EU 009	PER 002		4.800E-01	1.200E-01	7.000E-02	
	EU 010	PER 001		5.700E-01	2.510E+00	9.000E-02	
	EU 010	PER 002		7.400E-01	1.900E-01	1.100E-01	
	EU 011	PER 001		1.300E-01	5.600E-01		
	EU 011	PER 002		2.100E-01	9.300E-01		
	EU 012	PER 001		1.300E-01	5.600E-01		
	EU 012	PER 002		2.100E-01	9.300E-01		
	EU 013	PER 001		1.300E-01	5.600E-01		
	EU 013	PER 002		2.100E-01	9.300E-01		
	EU 014	PER 001		1.300E-01	5.600E-01		
	EU 014	PER 002		2.100E-01	9.300E-01		
	EU 015	PER 001		7.500E-01	3.280E+00	1.100E-01	
	EU 015	PER 002		4.300E-01	1.100E-01	7.000E-02	
	EU 016	PER 001		7.500E-01	3.280E+00	1.100E-01	
	EU 016	PER 002		4.300E-01	1.100E-01	7.000E-02	
	EU 017	PER 001		7.500E-01	3.280E+00	1.100E-01	
	EU 017	PER 002		4.300E-01	1.100E-01	7.000E-02	
	EU 018	PER 001		1.100E-01	4.800E-01	2.000E-02	
	EU 018	PER 002		6.500E-01	1.600E-01	1.000E-01	
	EU 019	PER 002		3.000E-02	1.300E-01	1.300E-01	
	EU 020	PER 002		3.000E-02	1.300E-01	1.300E-01	
	EU 021	PER 002		2.000E-02	1.000E-01	1.000E-01	
	EU 022	PER 002		2.000E-02	1.000E-01	1.000E-01	

## FACILITY DESCRIPTION: Potential-to-emit (by pollutant)

Show: Active and Pending Records

AQD Facility ID: 05300061

Facility Name: Abbott Northwestern Hospital

Pollutant	Item	Added By (Action)	Retired By (Action)	Hourly Potential (lbs per hr)	Unrestricted Potential (tons per yr)	Limited Potential (tons per yr)	Actual Emissions (tons per yr)
<b>Total Particulate Matter</b>							
	EU 023	PER 002		2.000E-02	1.000E-01	1.000E-01	
	EU 024	PER 002		2.000E-02	1.000E-01	1.000E-01	
	EU 025	PER 002		1.000E-02	6.000E-02	6.000E-02	
	EU 026	PER 002		1.000E-02	6.000E-02	6.000E-02	
	EU 027	PER 002		2.300E-01	6.000E-02	3.000E-02	
	EU 028	PER 002		2.000E-02	1.000E-01	1.000E-01	
	GP 001	PER 002				3.240E+00	
	GP 003	PER 002				1.300E+00	
Totals					2.272E+01	6.140E+00	0.000E+00
<b>Selenium compounds</b>							
	EU 001	PER 002		4.350E-04	1.910E-03		
	EU 002	PER 002		4.350E-04	1.910E-03		
	EU 003	PER 002		4.350E-04	1.910E-03		
	EU 004	PER 002		1.160E-03	5.060E-03		
	EU 011	PER 002		1.340E-04	5.890E-04		
	EU 012	PER 002		1.340E-04	5.890E-04		
	EU 013	PER 002		1.340E-04	5.890E-04		
	EU 014	PER 002		1.340E-04	5.890E-04		
	EU 019	PER 002		9.600E-08	4.200E-07	4.200E-07	
	EU 020	PER 002		9.600E-08	4.200E-07	4.200E-07	
	EU 021	PER 002		7.200E-08	3.150E-07	3.150E-07	
	EU 022	PER 002		7.200E-08	3.150E-07	3.150E-07	
	EU 023	PER 002		7.200E-08	3.150E-07	3.150E-07	
	EU 024	PER 002		7.200E-08	3.150E-07	3.150E-07	
	EU 025	PER 002		4.020E-08	1.760E-07	1.760E-07	
	EU 026	PER 002		4.020E-08	1.760E-07	1.760E-07	
	EU 028	PER 002		7.200E-08	3.150E-07	3.150E-07	
	GP 001	PER 002				7.990E-04	
	GP 003	PER 002				1.470E-04	
Totals					1.315E-02	9.488E-04	0.000E+00
<b>Sulfur Dioxide</b>							
	EU 001	PER 001		4.603E+01	2.016E+02		
	EU 001	PER 002		4.000E-02	1.900E-01		
	EU 002	PER 001		4.603E+01	2.016E+02		
	EU 002	PER 002		4.000E-02	1.900E-01		

## FACILITY DESCRIPTION: Potential-to-emit (by pollutant)

Show: Active and Pending Records

AQD Facility ID: 05300061

Facility Name: Abbott Northwestern Hospital

Pollutant	Item	Added By (Action)	Retired By (Action)	Hourly Potential (lbs per hr)	Unrestricted Potential (tons per yr)	Limited Potential (tons per yr)	Actual Emissions (tons per yr)
Sulfur Dioxide	EU 003	PER 001		4.603E+01	2.016E+02		
	EU 003	PER 002		4.000E-02	1.900E-01		
	EU 004	PER 001		1.224E+02	5.359E+02		
	EU 004	PER 002		1.200E-01	5.100E-01		
	EU 005	PER 001		2.340E+00	1.026E+01	3.500E-01	
	EU 005	PER 002		1.000E-02	0.000E+00	0.000E+00	
	EU 006	PER 001		2.340E+00	1.026E+01	3.500E-01	
	EU 006	PER 002		1.000E-02	0.000E+00	0.000E+00	
	EU 007	PER 001		2.640E+00	1.155E+01	4.000E-01	
	EU 007	PER 002		1.000E-02	0.000E+00	0.000E+00	
	EU 008	PER 001		2.640E+00	1.155E+01	4.000E-01	
	EU 008	PER 002		1.000E-02	0.000E+00	0.000E+00	
	EU 009	PER 001		3.510E+00	1.539E+01	5.300E-01	
	EU 009	PER 002		1.000E-02	0.000E+00	0.000E+00	
	EU 010	PER 001		1.230E+00	5.390E+00	1.800E-01	
	EU 010	PER 002		0.000E+00	0.000E+00	0.000E+00	
	EU 011	PER 001		4.630E+00	2.027E+01		
	EU 011	PER 002		1.000E-02	6.000E-02		
	EU 012	PER 001		4.630E+00	2.027E+01		
	EU 012	PER 002		1.000E-02	6.000E-02		
	EU 013	PER 001		4.630E+00	2.027E+01		
	EU 013	PER 002		1.000E-02	6.000E-02		
	EU 014	PER 001		4.630E+00	2.027E+01		
	EU 014	PER 002		1.000E-02	6.000E-02		
	EU 015	PER 001		4.330E+00	1.896E+01	6.500E-01	
	EU 015	PER 002		1.000E-02	0.000E+00	1.400E-03	
	EU 016	PER 001		4.330E+00	1.896E+01	6.500E-01	
	EU 016	PER 002		1.000E-02	0.000E+00	1.400E-03	
	EU 017	PER 001		4.330E+00	1.896E+01	6.500E-01	
	EU 017	PER 002		1.000E-02	0.000E+00	1.400E-03	
	EU 018	PER 001		1.550E+00	6.770E+00	2.300E-01	
	EU 018	PER 002		0.000E+00	0.000E+00	4.800E-04	
	EU 019	PER 002		0.000E+00	1.000E-02	1.000E-02	
	EU 020	PER 002		0.000E+00	1.000E-02	1.000E-02	
	EU 021	PER 002		0.000E+00	1.000E-02	1.000E-02	

## FACILITY DESCRIPTION: Potential-to-emit (by pollutant)

Show: Active and Pending Records

AQD Facility ID: 05300061

Facility Name: Abbott Northwestern Hospital

Pollutant	Item	Added By (Action)	Retired By (Action)	Hourly Potential (lbs per hr)	Unrestricted Potential (tons per yr)	Limited Potential (tons per yr)	Actual Emissions (tons per yr)
<b>Sulfur Dioxide</b>	EU 022	PER 002		0.000E+00	1.000E-02	1.000E-02	
	EU 023	PER 002		0.000E+00	1.000E-02	1.000E-02	
	EU 024	PER 002		0.000E+00	1.000E-02	1.000E-02	
	EU 025	PER 002		0.000E+00	0.000E+00	0.000E+00	
	EU 026	PER 002		0.000E+00	0.000E+00	0.000E+00	
	EU 027	PER 002		3.000E-02	1.000E-02	0.000E+00	
	EU 028	PER 002		0.000E+00	1.000E-02	1.000E-02	
	GP 001	PER 002				2.400E-01	
	GP 003	PER 002				1.000E-01	
Totals					1.400E+00	4.147E-01	0.000E+00
<b>Volatile Organic Compounds</b>	EU 001	PER 001		8.000E-02	3.400E-01		
	EU 001	PER 002		1.600E-01	6.800E-01		
	EU 002	PER 001		8.000E-02	3.400E-01		
	EU 002	PER 002		1.600E-01	6.800E-01		
	EU 003	PER 001		8.000E-02	3.400E-01		
	EU 003	PER 002		1.600E-01	6.800E-01		
	EU 004	PER 001		2.100E-01	9.000E-01		
	EU 004	PER 002		4.200E-01	1.820E+00		
	EU 005	PER 001		1.040E+00	4.580E+00	1.600E-01	
	EU 005	PER 002		4.100E-01	1.000E-01	6.000E-02	
	EU 006	PER 001		1.040E+00	4.580E+00	1.600E-01	
	EU 006	PER 002		4.100E-01	0.000E+00	6.000E-02	
	EU 007	PER 001		1.180E+00	5.150E+00	1.800E-01	
	EU 007	PER 002		4.600E-01	1.200E-01	7.000E-02	
	EU 008	PER 001		1.180E+00	5.150E+00	1.800E-01	
	EU 008	PER 002		4.600E-01	1.200E-01	7.000E-02	
	EU 009	PER 001		1.570E+00	6.860E+00	2.400E-01	
	EU 009	PER 002		6.200E-01	1.500E-01	9.000E-02	
	EU 010	PER 001		5.500E-01	2.400E+00	8.000E-02	
	EU 010	PER 002		8.400E-01	2.100E-01	1.300E-01	
	EU 011	PER 001		5.000E-02	2.100E-01		
	EU 011	PER 002		5.000E-02	2.100E-01		
	EU 012	PER 001		5.000E-02	2.100E-01		
	EU 012	PER 002		5.000E-02	2.100E-01		

## FACILITY DESCRIPTION: Potential-to-emit (by pollutant)

Show: Active and Pending Records

AQD Facility ID: 05300061

Facility Name: Abbott Northwestern Hospital

Pollutant	Item	Added By (Action)	Retired By (Action)	Hourly Potential (lbs per hr)	Unrestricted Potential (tons per yr)	Limited Potential (tons per yr)	Actual Emissions (tons per yr)
<b>Volatile Organic Compounds</b>							
	EU 013	PER 001		5.000E-02	2.100E-01		
	EU 013	PER 002		5.000E-02	2.100E-01		
	EU 014	PER 001		5.000E-02	2.100E-01		
	EU 014	PER 002		5.000E-02	2.100E-01		
	EU 015	PER 001		6.900E-01	3.010E+00	1.000E-01	
	EU 015	PER 002		5.600E-01	1.400E-01	8.000E-02	
	EU 016	PER 001		6.900E-01	3.010E+00	1.000E-01	
	EU 016	PER 002		5.600E-01	1.400E-01	8.000E-02	
	EU 017	PER 001		6.900E-01	3.010E+00	1.000E-01	
	EU 017	PER 002		5.600E-01	1.400E-01	8.000E-02	
	EU 018	PER 001		1.200E-01	5.300E-01	2.000E-02	
	EU 018	PER 002		7.300E-01	1.800E-01	1.100E-01	
	EU 019	PER 002		2.000E-02	1.000E-01	1.000E-01	
	EU 020	PER 002		2.000E-02	1.000E-01	1.000E-01	
	EU 021	PER 002		2.000E-02	7.000E-02	7.000E-02	
	EU 022	PER 002		2.000E-02	7.000E-02	7.000E-02	
	EU 023	PER 002		2.000E-02	7.000E-02	7.000E-02	
	EU 024	PER 002		2.000E-02	7.000E-02	7.000E-02	
	EU 025	PER 002		1.000E-02	4.000E-02	4.000E-02	
	EU 026	PER 002		1.000E-02	4.000E-02	4.000E-02	
	EU 027	PER 002		9.300E-01	2.300E-01	1.400E-01	
	EU 028	PER 002		2.000E-02	7.000E-02	7.000E-02	
	GP 001	PER 002				1.650E+00	
	GP 003	PER 002				8.300E-01	
<b>Totals</b>					6.860E+00	4.080E+00	0.000E+00





# COMPLIANCE PLAN **CD-01**

Facility Name: Abbott Northwestern Hospital

Permit Number: 05300061 - 002

**Subject Item: Total Facility**

	NC/ CA	Type	Citation	Requirement
1.0		CD	Minn. R. 7007.0800, subp. 2	<p>Permit Appendices: This permit contains appendices as listed in the permit Table of Contents.</p> <p>The Permittee shall comply with all requirements contained in Appendix I: Insignificant Activities and Applicable Requirements.</p> <p>Modeling parameters in Appendix II: Emission Rates and Exhaust Parameters Used for Modeling are included for reference only.</p>
2.0		CD	Minn. Stat. Section 116.07, subd. 4a; Minn. R. 7007.0800, subps. 1, 2 & 4	<p>The parameters used in NO<sub>2</sub>, PM<sub>10</sub>, PM<sub>2.5</sub>, CO, Lead, and SO<sub>2</sub> modeling for permit number 05300061-002 are listed in Appendix II of this permit. The parameters describe the operation of the facility at maximum permitted capacity. The purpose of listing the parameters in the appendix is to provide a benchmark for future changes.</p>
3.0		CD	hdr	OPERATIONAL REQUIREMENTS
4.0		CD	40 CFR pt. 50; Minn. Stat. Section 116.07, subds. 4a & 9; Minn. R. 7007.0100, subp. 7(A), 7(L), & 7(M); Minn. R. 7007.0800, subps. 1, 2 & 4; Minn. R. 7009.0010-7009.0080	<p>The Permittee shall comply with National Primary and Secondary Ambient Air Quality Standards, 40 CFR pt. 50, and the Minnesota Ambient Air Quality Standards, Minn. R. 7009.0010 to 7009.0080. Compliance shall be demonstrated upon written request by the MPCA.</p>
5.0		CD	Minn. R. 7011.0020	<p>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.</p>
6.0		CD	Minn. R. 7007.0800, subp. 2; Minn. R. 7007.0800, subp. 16(J)	<p>Air Pollution Control Equipment: Operate all pollution control equipment whenever the corresponding process equipment and emission units are operated.</p>
7.0		CD	Minn. R. 7007.0800, subps. 14 and 16(J)	<p>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 &amp; M plan shall identify all air pollution control equipment and control practices and shall include a preventative maintenance program for the equipment and practices, a description of (the minimum but not necessarily the only) corrective actions to be taken to restore the equipment and practices 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 practices, and the records kept to demonstrate plan implementation.</p>
8.0		CD	Minn. R. 7019.1000, subp. 4	<p>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.</p>
9.0		CD	Minn. R. 7011.0150	<p>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.</p>
10.0		CD	Minn. R. 7030.0010 - 7030.0080	<p>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.</p>
11.0		CD	Minn. R. 7007.0800, subp. 9(A)	<p>Inspections: The Permittee shall comply with the inspection procedures and requirements as found in Minn. R. 7007.0800, subp. 9(A).</p>
12.0		CD	Minn. R. 7007.0800, subp. 16	<p>The Permittee shall comply with the General Conditions listed in Minn. R. 7007.0800, subp. 16.</p>
13.0		CD	hdr	MONITORING REQUIREMENTS
14.0		CD	Minn. R. 7007.0800, subp. 4(D)	<p>Monitoring Equipment Calibration: The Permittee shall calibrate all required monitoring equipment at least once every 12 months (any requirements applying to continuous emission monitors are listed separately in this permit).</p>



## COMPLIANCE PLAN **CD-01**

Facility Name: Abbott Northwestern Hospital

Permit Number: 05300061 - 002

15.0		CD	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.
16.0		CD	hdr	RECORDKEEPING
17.0		CD	Minn. R. 7007.0800, subp. 5(C)	Recordkeeping: Retain all records at the stationary source, unless otherwise specified within this permit, 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).
18.0		CD	Minn. R. 7007.0800, subp. 5(B)	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.
19.0		CD	Minn. R. 7007.1200, subp. 4	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 nonexpiring 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.
20.0		CD	hdr	REPORTING/SUBMITTALS
21.0		CD	Minn. R. 7019.1000, subp. 3	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.
22.0		CD	Minn. R. 7019.1000, subp. 2	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.
23.0		CD	Minn. R. 7019.1000, subp. 1	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.
24.0		CD	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: 1. the cause of the deviation; 2. the exact dates of the period of the deviation, if the deviation has been corrected; 3. whether or not the deviation has been corrected; 4. the anticipated time by which the deviation is expected to be corrected, if not yet corrected; and 5. steps taken or planned to reduce, eliminate, and prevent reoccurrence of the deviation.



## COMPLIANCE PLAN **CD-01**

Facility Name: Abbott Northwestern Hospital

Permit Number: 05300061 - 002

25.0		S/A	Minn. R. 7007.0800, subp. 6(A)(2)	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 occurred, the Permittee shall submit the report stating no deviations.
26.0		CD	Minn. R. 7007.1150 - 7007.1500	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.
27.0		CD	Minn. R. 7007.1400, subp. 1(H)	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).
28.0		S/A	Minn. R. 7007.0800, subp. 6(C)	Compliance Certification: due 31 days after end of each calendar year following Permit Issuance (for the previous calendar year). The Permittee shall submit this to the Commissioner on a form approved by the Commissioner. This report covers all deviations experienced during the calendar year.
29.0		CD	Minn. R. 7019.3000 - 7019.3100	Emission Inventory Report: due on or before April 1 of each calendar year following permit issuance, to be submitted on a form approved by the Commissioner.
30.0		CD	Minn. R. 7002.0005 - 7002.0095	Emission Fees: due 60 days after receipt of an MPCA bill.



# COMPLIANCE PLAN **CD-01**

Facility Name: Abbott Northwestern Hospital

Permit Number: 05300061 - 002

**Subject Item:** GP 001 Main Campus Natural Gas/No. 2 Fuel Oil Boilers (EU001-EU004)

**Associated Items:** EU 001 Package Watertube Boiler 1

EU 002 Package Watertube Boiler 2

EU 003 Package Watertube Boiler 3

EU 004 Package Watertube Boiler 4

	NC/ CA	Type	Citation	Requirement
1.0		CD	hdr	Emission limits apply to each emission unit individually
2.0		LIMIT	Minn. R. 7011.0510, subp. 1	Total Particulate Matter: less than or equal to 0.4 lbs/million Btu heat input
3.0		LIMIT	Minn. R. 7011.0510, subp. 2	Opacity: less than or equal to 20 percent opacity except for one six-minute period per hour of not more than 60% opacity.
4.0		CD	Title I Condition: To avoid classification as major source under 40 CFR Section 52.21 and Minn. R. 7007.3000; To avoid major source classification under 40 CFR Section 70.2 and Minn. R. 7007.0200; Minn. R. 7005.0100, subp. 35a	Permitted Fuels: Natural gas and No. 2 residual fuel oil with a sulfur content not exceeding 0.0015% by weight.
5.0		LIMIT	Title I Condition: To avoid classification as major source under 40 CFR Section 52.21 and Minn. R. 7007.3000; To avoid major source classification under 40 CFR Section 70.2 and Minn. R. 7007.0200	Fuel Usage: less than or equal to 525 million cubic feet/year natural gas using 12-month Rolling Sum.
6.0		LIMIT	Title I Condition: To avoid classification as major source under 40 CFR Section 52.21 and Minn. R. 7007.3000; To avoid major source classification under 40 CFR Section 70.2 and Minn. R. 7007.0200	Fuel Usage: less than or equal to 755,000 gallons/year using 12-month Rolling Sum of No. 2 fuel oil using 12-month Rolling Sum.
7.0		CD	Minn. R. 7007.0800, subps. 4 and 5	Monthly Natural Gas Recordkeeping:  By the third Tuesday of each month, the Permittee shall calculate and record the following: 1) The total natural gas usage for the previous calendar month. 2) The 12-month rolling sum natural gas usage for the previous 12-month period by summing the monthly natural gas usage data for the previous 12 months.
8.0		CD	Minn. R. 7007.0800, subps. 4 and 5	Monthly No. 2 Fuel Oil Recordkeeping:  By the third Tuesday of each month, the Permittee shall calculate and record for each boiler in GP001 the following: 1) The total No. 2 fuel oil usage for the previous calendar month. 2) The 12-month rolling sum No. 2 fuel oil usage for the previous 12-month period by summing the monthly No. 2 usage data for the previous 12 months.
9.0		CD	Minn. R. 7007.0800, subps. 4 and 5	Fuel Supplier Certification: The Permittee shall obtain and maintain a fuel supplier certification for each shipment of No. 2 fuel oil, certifying that the sulfur content does not exceed 0.0015% by weight.
10.0		CD	hdr	Requirements under 40 CFR pt. 63, Subpart JJJJJJ: National Emission Standards for Hazardous Air Pollutants for Industrial, Commercial and Institutional Boilers Area Sources  Enforcement not delegated to MPCA.
11.0		CD	hdr	OPERATIONAL REQUIREMENTS
12.0		CD	40 CFR Section 63.11196(a)(3)	The Permittee shall comply with the requirement to conduct an energy assessment no later than March 21, 2014.



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13.0		CD	40 CFR Section 63.11196(a)(1)	The Permittee shall comply with the requirement to conduct a tune-up according to 40 CFR Section 63.11223(b); no later than March 21, 2012, or a later date as determined by EPA rulemaking to amend Subpart JJJJJJ.
14.0		CD	40 CFR Section 63.11205(a)	At all times the Permittee must operate and maintain affected boilers, including associated air pollution control equipment and monitoring equipment, in a manner consistent with safety and good air pollution control practices for minimizing emissions. Determination of whether such operation and maintenance procedures are being used will be based on information available to the Administrator that may include, but is not limited to, monitoring results, review of operation and maintenance procedures, review of operation and maintenances records, and inspection of the source.
15.0		CD	40 CFR Section 63.11210(c)	The Permittee shall demonstrate initial compliance with each applicable work practice standard, management practice, or emission reduction measure no later than March 21, 2014 and according to the applicable provisions in 40 CFR Section 63.7(a)(2).
16.0		CD	40 CFR 63.11201(b); 40 CFR Section 63, subp. JJJJJJ, Table 2	<p>The Permittee must have a one-time energy assessment performed by a qualified energy assessor. An energy assessment completed on or after January 1, 2008, that meets or is amended to meet the energy assessment requirements in this table satisfies the energy assessment requirement. The energy assessment must include</p> <p>(1) A visual inspection of the boiler system,</p> <p>(2) An evaluation of operating characteristics of the facility, specifications of energy using systems, operating and maintenance procedures, and unusual operating constraints,</p> <p>(continued below)</p>
17.0		CD	40 CFR 63.11201(b); 40 CFR Section 63, subp. JJJJJJ, Table 2	<p>(continued)</p> <p>(3) Inventory of major systems consuming energy from affected boiler(s),</p> <p>(4) A review of available architectural and engineering plans, facility operation and maintenance procedures and logs, and fuel usage,</p> <p>(5) A list of major energy conservation measures,</p> <p>(6) A list of the energy savings potential of the energy conservation measures identified,</p> <p>(7) A comprehensive report detailing the ways to improve efficiency, the cost of specific improvements, benefits, and the time frame for recouping those investments.</p>
18.0		CD	40 CFR Section 63.11201(b); 40 CFR Section 63.11223(a); 40 CFR Section 63, subp. JJJJJJ, Table 2	The Permittee must conduct a tune-up for each boiler biennially and keep records as required in 40 CFR Section 63.11225(c) to demonstrate continuous compliance. Each biennial tune-up must be conducted no more than 25 months after the previous tune-up.
19.0		CD	40 CFR Section 63.11223(b)	<p>The Permittee must conduct a tune-up of the boiler biennially to demonstrate continuous compliance as specified in (1) through (7) as follows:</p> <p>(1) As applicable, inspect the burner, and clean or replace any components of the burner as necessary (you may delay the burner inspection until the next scheduled unit shutdown, but you must inspect each burner at least once every 36 months).</p> <p>(2) Inspect the flame pattern, as applicable, and adjust the burner as necessary to optimize the flame pattern. The adjustment should be consistent with the manufacturer's specifications, if available.</p> <p>(3) Inspect the system controlling the air-to-fuel ratio, as applicable, and ensure that it is correctly calibrated and functioning properly.</p> <p>(4) Optimize total emissions of carbon monoxide. This optimization should be consistent with the manufacturer's specifications, if available.</p> <p>(continued below)</p>



## COMPLIANCE PLAN **CD-01**

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20.0		CD	40 CFR Section 63.11223(b)	<p>(continued)</p> <p>(5) Measure the concentrations in the effluent stream of carbon monoxide in parts per million, by volume, and oxygen in volume percent, before and after the adjustments are made (measurements may be either on a dry or wet basis, as long as it is the same basis before and after the adjustments are made).</p> <p>(6) Maintain onsite and submit, if requested by the Administrator, biennial report containing the information in (6)(i) through (iii) below:</p> <p>(i) The concentrations of CO in the effluent stream in parts per million, by volume, and oxygen in volume percent, measured before and after the tune-up of the boiler.</p> <p>(ii) A description of any corrective actions taken as a part of the tune-up of the boiler.</p> <p>(iii) The type and amount of fuel used over the 12 months prior to the biennial tune-up of the boiler.</p> <p>(7) If the unit is not operating on the required date for a tune-up, the tune-up must be conducted within one week of startup.</p>
21.0		CD	40 CFR Section 63.11235; 40 CFR pt. 63 subp. JJJJJJ, Table 8	The Permittee must comply with the General Provisions as applicable in Table 8 of 40 CFR pt. 63, subp. JJJJJJ.
22.0		CD	hdr	RECORDKEEPING
23.0		CD	40 CFR Section 63.11225(c)	<p>The Permittee must maintain the following records:</p> <p>(1) A copy of each notification and report that was submitted to comply with subpart JJJJJJ, including all documentation supporting any Initial Notification or Notification of Compliance Status that was submitted, according to the requirements in 40 CFR Section 63.10(b)(2)(xiv);</p> <p>(2) Records to document conformance with the work practices, emission reduction measures, and management practices required by 40 CFR Section 63.11214 as specified as follows:</p> <p>(i) Records must identify each boiler, the date of tune-up, the procedures followed for tune-up, and the manufacturer's specifications to which the boiler was tuned.</p> <p>(ii) Records documenting the fuel type(s) used monthly by each boiler, including, but not limited to, a description of the fuel and the total fuel usage amount with units of measure.</p> <p>(continued below)</p> <p>(continued below)</p>
24.0		CD	40 CFR Section 63.11225(c)	<p>(continued)</p> <p>(3) Records of the occurrence and duration of each malfunction of each boiler or of the associated air pollution control and monitoring equipment.</p> <p>(4) Records of actions taken during periods of malfunction to minimize emissions in accordance with the general duty to minimize emissions in 40 CFR Section 63.11205(a), including corrective actions to restore the malfunctioning boiler, air pollution control, or monitoring equipment to its normal or usual manner of operation.</p> <p>(continued below)</p>
25.0		CD	40 CFR Section 63.11225(c)	<p>(continued)</p> <p>(5) The Permittee must maintain records of all inspection and monitoring data as required by 40 CFR Sections 63.11221 and 63.11222, and the information identified below for each required inspection or monitoring:</p> <p>(i) The date, place, and time of the monitoring event;</p> <p>(ii) Person conducting the monitoring.</p> <p>(iii) Technique or method used;</p> <p>(iv) Operating conditions during the activity;</p> <p>(v) Results, including the date, time, and duration of the period from the time the monitoring indicated a problem to the time that monitoring indicated proper operation; (vi) Maintenance or corrective action taken (if applicable).</p>



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26.0		CD	40 CFR Section 63.11225(d)	Records must be in a form suitable and readily available for expeditious review, according to 40 CFR Section 63.10(b)(1). The Permittee must keep each record for 5 years following the date of each recorded action. The Permittee must keep each record onsite for at least 2 years after the date of each recorded action according to 40 CFR Section 63.10(b)(1). The Permittee may keep the records off site for the remaining 3 years.
27.0		CD	hdr	REPORTING AND NOTIFICATION REQUIREMENTS
28.0		CD	40 CFR Sections 63.11225(b)	<p>The Permittee must prepare by March 1 of each year, and submit to the Administrator upon request, an annual compliance certification report. The Permittee must submit the annual compliance report if the Permittee had any instance described by item 3 below. The annual compliance certification report for the previous calendar year must contain the information the following.</p> <p>(1) Company name and address</p> <p>(2) Statement by a responsible official, with the official's name, title, phone number, e-mail address, and signature, certifying the truth, accuracy, and completeness of the notification and a statement of whether the source has complied with all the relevant standards and other requirements of Subpart JJJJJJ.</p> <p>(3) Include a description of deviations from the applicable requirements during the reporting period, the time periods during which the deviations occurred, and the corrective actions taken.</p>
29.0		CD	40 CFR Section 63.11225(a)(4)	<p>The Permittee must submit the Notification of Compliance Status in accordance with 40 CFR Section 63.9(h) no later than 120 days after the applicable compliance date specified in 40 CFR Section 63.11196. In addition to the information required in 40 CFR Section 63.9(h), the notification must include the following certifications of compliance, as applicable and signed by a responsible official:</p> <p>(1) <input type="checkbox"/> This facility complies with the requirements in 40 CFR Section 63.11214 to conduct an initial tune-up of the boiler.<input type="checkbox"/></p> <p>(2) <input type="checkbox"/> This facility has had an energy assessment performed according to 40 CFR Section 63.11214(c).<input type="checkbox"/></p>
30.0		CD	40 CFR Section 63.11214(c)	The Permittee must submit a signed certification in the Notification of Compliance Status report that an energy assessment of the boiler and its energy use systems was completed and submit, upon request, the energy assessment report.
31.0		CD	40 CFR Section 63.11214(b)	The Permittee must conduct a performance tune-up according to 40 CFR pt. 63.11223(b) and submit a signed statement in the Notification of Compliance Status report that indicates that the Permittee conducted a tune-up of the boiler.
32.0		CD	40 CFR Section 63.11225(a)(1)	The Permittee must submit all of the notifications in 40 CFR Sections 63.7(b); 63.8(e) and (f); 63.9(b) through (e); and 63.9(g) and (h) that apply by the dates specified in those sections.





## COMPLIANCE PLAN **CD-01**

Facility Name: Abbott Northwestern Hospital

Permit Number: 05300061 - 002

**Subject Item:** GP 002 Emergency Generators 1-10

**Associated Items:** EU 005 Reciprocating Engine Generator 1  
EU 006 Reciprocating Engine Generator 2  
EU 007 Reciprocating Engine Generator 3  
EU 008 Reciprocating Engine Generator 4  
EU 009 Reciprocating Engine Generator 5  
EU 010 Reciprocating Engine Generator 6  
EU 015 Reciprocating Engine Generator 7  
EU 016 Reciprocating Engine Generator 8  
EU 017 Reciprocating Engine Generator 9  
EU 018 Reciprocating Engine Generator 10

	NC/ CA	Type	Citation	Requirement
1.0		CD	hdr	These requirements apply to each GP002 emergency generator individually.
2.0		LIMIT	Minn. R. 7011.2300, subp. 1	Opacity: less than or equal to 20 percent opacity once operating temperature have been obtained.
3.0		LIMIT	Minn. R. 7011.2300, subp. 2	Sulfur Dioxide: less than or equal to 0.5 lbs/million Btu heat input .  The potential to emit from each GP002 unit is less than 0.002 lb/MMBtu due to equipment design and allowable fuels.
4.0		CD	Title I Condition: To avoid classification as major source under 40 CFR Section 52.21 and Minn. R. 7007.3000; To avoid major source classification under 40 CFR Section 70.2 and Minn. R. 7007.0200	Permitted Fuel: No. 2 fuel oil with a sulfur content not exceeding 0.0015% by weight.
5.0		LIMIT	Title I Condition: To avoid classification as major source under 40 CFR Section 52.21 and Minn. R. 7007.3000; To avoid major source classification under 40 CFR Section 70.2 and Minn. R. 7007.0200	Operating Hours: less than or equal to 300 hours/year using 12-month Rolling Sum for each generator.
6.0		CD	Minn. R. 7007.0800, subps. 4 and 5	The Permittee shall keep records of fuel type and hourly usage on a monthly basis.
7.0		CD	Minn. R. 7007.0800, subps. 4 and 5	Fuel Supplier Certification: The Permittee shall obtain and maintain a fuel supplier certification for each shipment of No. 2 fuel oil, certifying that the sulfur content does not exceed 0.0015% by weight.
8.0		CD	Minn. R. 7007.0800, subps. 4 and 5	During every monthly test of each emergency generator, record the following information: 1) the date, 2) the time the test was started, and 3) the time the test was completed.
9.0		CD	40 CFR Section 63.6590 (b)(3)(viii); 40 CFR Section 63.6675; Minn. R. 7007.0800, subp. 2	After May 13, 2012, the compliance date for 40 CFR pt. 63, subp. ZZZZ, the Permittee shall maintain records to document that each GP002 unit meets the criteria for stationary RICE subject to limited requirements in 40 CFR Section 63.6590(b)(3)(viii) and the definition of emergency stationary RICE under 40 CFR Section 63.6675.





## COMPLIANCE PLAN **CD-01**

Facility Name: Abbott Northwestern Hospital

Permit Number: 05300061 - 002

**Subject Item:** GP 003 Heart Hospital Natural Gas/No. 2 Fuel Oil Boilers (EU011-EU014)

**Associated Items:** EU 011 Flexible Watertube Boiler 5

EU 012 Flexible Watertube Boiler 6

EU 013 Flexible Watertube Boiler 7

EU 014 Flexible Watertube Boiler 8

	NC/ CA	Type	Citation	Requirement
1.0		CD	hdr	Emission limits apply to each emission unit individually
2.0		LIMIT	Minn. R. 7011.0510, subp. 1	Total Particulate Matter: less than or equal to 0.4 lbs/million Btu heat input
3.0		LIMIT	Minn. R. 7011.0510, subp. 2	Opacity: less than or equal to 20 percent opacity except for one six-minute period per hour of not more than 60% opacity.
4.0		CD	Title I Condition: To avoid classification as major source under 40 CFR Section 52.21 and Minn. R. 7007.3000; To avoid major source classification under 40 CFR Section 70.2 and Minn. R. 7007.0200; Minn. R. 7005.0100, subp. 35a	Permitted Fuels: Natural gas and No. 2 fuel oil with a sulfur content not exceeding 0.015% by weight.
5.0		LIMIT	Title I Condition: To avoid classification as major source under 40 CFR Section 52.21 and Minn. R. 7007.3000; To avoid major source classification under 40 CFR Section 70.2 and Minn. R. 7007.0200	Fuel Usage: less than or equal to 137,000 gallons/year of No. 2 distillate fuel oil, calculated monthly as a 12-month Rolling Sum.
6.0		CD	Minn. R. 7007.0800, subps. 4 and 5	Monthly No. 2 Fuel Oil Recordkeeping:  By the third Tuesday of each month, the Permittee shall calculate and record the following: 1) The total No. 2 fuel oil usage during the previous month (in gallons), and  2) The 12-month rolling sum No. 2 fuel oil usage (in gallons) for the previous 12-month period by summing the monthly No. 2 fuel oil usage data for the previous 12 months.
7.0		CD	Minn. R. 7007.0800, subps. 4 and 5	Fuel Supplier Certification: The Permittee shall obtain and maintain a fuel supplier certification for each shipment of No. 2 fuel oil, certifying that the sulfur content does not exceed 0.0015% by weight.
8.0		CD	hdr	Requirements under 40 CFR pt. 63, Subpart JJJJJJ: National Emission Standards for Hazardous Air Pollutants for Industrial, Commercial and Institutional Boilers Area Sources  Enforcement not delegated to MPCA.
9.0		CD	hdr	OPERATIONAL REQUIREMENTS
10.0		CD	40 CFR Section 63.11196(a)(1)	The Permittee shall comply with the requirement to conduct a tune-up according to 40 CFR Section 63.11223(b); no later than March 21, 2012, or a later date as determined by EPA rulemaking to amend Subpart JJJJJJ.
11.0		CD	40 CFR Section 63.11205(a)	At all times the Permittee must operate and maintain affected boilers, including associated air pollution control equipment and monitoring equipment, in a manner consistent with safety and good air pollution control practices for minimizing emissions. Determination of whether such operation and maintenance procedures are being used will be based on information available to the Administrator that may include, but is not limited to, monitoring results, review of operation and maintenance procedures, review of operation and maintenances records, and inspection of the source.
12.0		CD	40 CFR Section 63.11210(c)	The Permittee must demonstrate initial compliance with each applicable work practice standard, management practice, or emission reduction measure no later than March 21, 2014 and according to the applicable provisions in 40 CFR Section 63.7(a)(2).



## COMPLIANCE PLAN **CD-01**

Facility Name: Abbott Northwestern Hospital

Permit Number: 05300061 - 002

13.0		CD	40 CFR Section 63.11201(b); 40 CFR Section 63.11223(a); 40 CFR Section 63, subp. JJJJJJ, Table 2	The Permittee must conduct a tune-up for each boiler biennially and keep records as required in 40 CFR Section 63.11225(c) to demonstrate continuous compliance. Each biennial tune-up must be conducted no more than 25 months after the previous tune-up.
14.0		CD	40 CFR Section 63.11223(b)	<p>The Permittee must conduct a tune-up of the boiler biennially to demonstrate continuous compliance as specified in (1) through (7) as follows:</p> <p>(1) As applicable, inspect the burner, and clean or replace any components of the burner as necessary (you may delay the burner inspection until the next scheduled unit shutdown, but you must inspect each burner at least once every 36 months).</p> <p>(2) Inspect the flame pattern, as applicable, and adjust the burner as necessary to optimize the flame pattern. The adjustment should be consistent with the manufacturer's specifications, if available.</p> <p>(3) Inspect the system controlling the air-to-fuel ratio, as applicable, and ensure that it is correctly calibrated and functioning properly.</p> <p>(4) Optimize total emissions of carbon monoxide. This optimization should be consistent with the manufacturer's specifications, if available.</p> <p>(continued below)</p>
15.0		CD	40 CFR Section 63.11223(b)	<p>(continued)</p> <p>(5) Measure the concentrations in the effluent stream of carbon monoxide in parts per million, by volume, and oxygen in volume percent, before and after the adjustments are made (measurements may be either on a dry or wet basis, as long as it is the same basis before and after the adjustments are made).</p> <p>(6) Maintain onsite and submit, if requested by the Administrator, biennial report containing the information in (6)(i) through (iii) below:</p> <p>(i) The concentrations of CO in the effluent stream in parts per million, by volume, and oxygen in volume percent, measured before and after the tune-up of the boiler.</p> <p>(ii) A description of any corrective actions taken as a part of the tune-up of the boiler.</p> <p>(iii) The type and amount of fuel used over the 12 months prior to the biennial tune-up of the boiler.</p> <p>(7) If the unit is not operating on the required date for a tune-up, the tune-up must be conducted within one week of startup.</p>
16.0		CD	40 CFR Section 63.11235; 40 CFR pt. 63 subp. JJJJJJ, Table 8	The Permittee must comply with the General Provisions as applicable in Table 8 of 40 CFR pt. 63, subp. JJJJJJ.
17.0		CD	hdr	RECORDKEEPING
18.0		CD	40 CFR Section 63.11225(c)	<p>The Permittee must maintain the following records:</p> <p>(1) A copy of each notification and report that was submitted to comply with subpart JJJJJJ, including all documentation supporting any Initial Notification or Notification of Compliance Status that was submitted, according to the requirements in 40 CFR Section 63.10(b)(2)(xiv);</p> <p>(2) Records to document conformance with the work practices, emission reduction measures, and management practices required by 40 CFR Section 63.11214 as follows:</p> <p>(i) Records must identify each boiler, the date of tune-up, the procedures followed for tune-up, and the manufacturer's specifications to which the boiler was tuned.</p> <p>(ii) Records documenting the fuel type(s) used monthly by each boiler, including, but not limited to, a description of the fuel and the total fuel usage amount with units of measure.</p> <p>(continued below)</p>



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19.0		CD	40 CFR Section 63.11225(c)	<p>(continued)</p> <p>(3) Records of the occurrence and duration of each malfunction of each boiler or of the associated air pollution control and monitoring equipment.</p> <p>(4) Records of actions taken during periods of malfunction to minimize emissions in accordance with the general duty to minimize emissions in 40 CFR Section 63.11205(a), including corrective actions to restore the malfunctioning boiler, air pollution control, or monitoring equipment to its normal or usual manner of operation.</p>
20.0		CD	40 CFR Section 63.11225(c)	<p>(continued)</p> <p>(5) Records of all inspection and monitoring data as required by 40 CFR Sections 63.11221 and 63.11222, and the information identified below for each required inspection or monitoring:</p> <p>(i) The date, place, and time of the monitoring event;</p> <p>(ii) Person conducting the monitoring.</p> <p>(iii) Technique or method used;</p> <p>(iv) Operating conditions during the activity;</p> <p>(v) Results, including the date, time, and duration of the period from the time the monitoring indicated a problem to the time that monitoring indicated proper operation;</p> <p>(vi) Maintenance or corrective action taken (if applicable).</p>
21.0		CD	40 CFR Section 63.11225(d)	Records must be in a form suitable and readily available for expeditious review, according to 40 CFR Section 63.10(b)(1). The Permittee must keep each record for 5 years following the date of each recorded action. The Permittee must keep each record onsite for at least 2 years after the date of each recorded action according to 40 CFR Section 63.10(b)(1). The Permittee may keep the records off site for the remaining 3 years.
22.0		CD	hdr	REPORTING AND NOTIFICATION REQUIREMENTS
23.0		CD	40 CFR Sections 63.11225(b)	<p>The Permittee must prepare by March 1 every two years, and submit to the Administrator upon request, an biennial compliance certification report. The Permittee must submit the biennial compliance report by March 15 if the Permittee had any instance described by item 3 below. The biennial compliance certification report for the previous two calendar years must contain the information the following.</p> <p>(1) Company name and address.</p> <p>(2) Statement by a responsible official, with the official's name, title, phone number, e-mail address, and signature, certifying the truth, accuracy, and completeness of the notification and a statement of whether the source has complied with all the relevant standards and other requirements of Subpart JJJJJJ.</p> <p>(3) Include a description of deviations from the applicable requirements during the reporting period, the time periods during which the deviations occurred, and the corrective actions taken.</p>
24.0		CD	40 CFR Section 63.11225(a)(4)	The Permittee must submit the Notification of Compliance Status in accordance with 40 CFR Section 63.9(h) no later than 120 days after the applicable compliance date specified in 40 CFR Section 63.11196. In addition to the information required in 40 CFR Section 63.9(h), the notification must include the following certifications of compliance, as applicable and signed by a responsible official: "This facility complies with the requirements in 40 CFR Section 63.11214 to conduct an initial tune-up of the boiler."
25.0		CD	40 CFR Section 63.11214(b)	The Permittee must conduct a performance tune-up according to 40 CFR pt. 63.11223(b) and submit a signed statement in the Notification of Compliance Status report that indicates that the Permittee conducted a tune-up of the boiler.
26.0		CD	40 CFR Section 63.11225(a)(1)	The Permittee must submit all of the notifications in 40 CFR Sections 63.7(b); 63.8(e) and (f); 63.9(b) through (e); and 63.9(g) and (h) that apply by the dates specified in those sections.



## COMPLIANCE PLAN **CD-01**

Facility Name: Abbott Northwestern Hospital

Permit Number: 05300061 - 002

**Subject Item:** GP 004 Natural Gas Boilers (10th Ave Bldg/Garage)

**Associated Items:** EU 019 Raypak H34001 (parking garage)

EU 020 Raypak H34001 (parking garage)

EU 021 Hydrotherm KN-30 #1(10th Ave-Lab)

EU 022 Hydrotherm KN-30 #2(10th Ave-Lab)

EU 023 Hydrotherm KN-30 #3(10th Ave-Lab)

EU 024 Hydrotherm KN-30 #4(10th Ave-Lab)

EU 025 Lattner#5 (10th Ave-Lab)

EU 026 Lattner#6 (10th Ave-Lab)

EU 028 Hydrotherm KN-30 #7(10th Ave)

	NC/ CA	Type	Citation	Requirement
1.0		CD	hdr	Emission limits apply to each emission unit individually
2.0		LIMIT	Minn. R. 7011.0515, subp. 1	Total Particulate Matter: less than or equal to 0.40 lbs/million Btu heat input .  The potential to emit from each GP004 unit is 0.0078 lb/mmBtu due to equipment design and allowable fuels.
3.0		LIMIT	Minn. R. 7011.0515, subp. 2	Opacity: less than or equal to 20 percent opacity except for one six-minute period per hour of not more than 60 percent opacity
4.0		CD	Minn. R. 7005.0100, subp. 35a	Fuel Type: Natural gas by design.



## COMPLIANCE PLAN **CD-01**

Facility Name: Abbott Northwestern Hospital

Permit Number: 05300061 - 002

**Subject Item:** GP 005 Ethylene Oxide Sterilizers and Abator

**Associated Items:** CE 001 Ethylene Oxide Abator

EU 029 Ethylene Oxide Sterilizer

EU 030 Ethylene Oxide Sterilizer

	NC/ CA	Type	Citation	Requirement
1.0		CD	Minn. Stat. Section 116.07, subd. 4a, Minn. R. 7007.0800, subps. 2 and 14	The Permittee shall vent emissions from the ethylene oxide sterilizers (EU029 and EU030) to control equipment meeting the requirements described in GP005.
2.0		CD	hdr	CONTROL EQUIPMENT REQUIREMENTS
3.0		LIMIT	Minn. R. 7007.0800, subps. 2 and 14	The Permittee shall operate and maintain the control equipment such that it achieves an overall control efficiency for Ethylene oxide: greater than or equal to 99.9 percent control efficiency
4.0		CD	Minn. R. 7007.0800, subps. 2 and 14	The Permittee shall operate and maintain the ethylene oxide abator any time that any ethylene oxide sterilizer controlled by the abator is(are) in operation. The Permittee shall document periods of non-operation of the control equipment.
5.0		CD	Minn. R. 7007.0800, subps. 4, 5, and 14	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.
6.0		CD	Minn. R. 7007.0800, subps. 4, 5, and 14	Corrective Actions: If the abator (CE001) 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 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 abator. The Permittee shall keep a record of the type and date of any corrective action taken for the abator.
7.0		CD	Minn. R. 7007.0800, subp. 14	Operation and Maintenance of the Abator (CE001): The Permittee shall operate and maintain the abator 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.
8.0		CD	hdr	40 CFR pt. 63, subp. WWWWW Requirements Enforcement Not Delegated to MPCA
9.0		CD	40 CFR Section 63.10382 and 63.10448	Abbott operates two Ethylene Oxide Sterilizers, each of which is an existing affected source subject to the requirements in Subpart WWWWW. Terms used in Subpart WWWWW are defined at 40 CFR Section 63.10448.
10.0		CD	40 CFR Section 63.10390 and 63.10448	The Permittee must sterilize full loads of items having a common aeration time, except under medically necessary circumstances.  Medically necessary means circumstances that a hospital central services staff, a hospital administrator, or a physician concludes, based on generally accepted medical practices, necessitate sterilizing without a full load in order to protect human health.  The Permittee must begin compliance with this requirement no later than December 29, 2008
11.0		CD	40 CFR Section 63.10400	The Permittee must submit an Initial Notification of Compliance Status certifying that the Permittee is venting the ethylene oxide emissions from each sterilization unit to an add-on air pollution control device. The Permittee must certify that the Permittee is operating the control device during all sterilization processes and in accordance with manufacturer's procedures.



## COMPLIANCE PLAN **CD-01**

Facility Name: Abbott Northwestern Hospital

Permit Number: 05300061 - 002

12.0		CD	40 CFR Sections 63.10402, 63.10430 and 63.10432; 40 CFR Section 63.13	<p>The Initial Notification of Compliance Status must be submitted no later than June 27, 2009.</p> <p>The Initial Notification of Compliance Status must include the information required in 40 CFR Section 63.10430.</p> <p>The Permittee must submit the Initial Notification of Compliance Status to: EPA Region V, Director, Air and Radiation Division, 77 West Jackson Blvd. Chicago, IL 60604-3507.</p> <p>The Permittee must also submit a copy of the Initial Notification of Compliance Status to the EPA's Office of Air Quality Planning and Standards at the addresses listed at 40 CFR Section 63.10430.</p> <p>The Permittee must keep a copy of the Initial Notification of Compliance Status submitted to demonstrate initial compliance.</p>
13.0		CD	40 CFR Sections 63.10432, 63.10434, and 63.10(b)(1); Minn. R. 7019.0100, subp. 2(B)	<p>The records required in 40 CFR Section 63.10432 must be kept in a form suitable for expeditious review.</p> <p>The records required in 40 CFR Section 63.10432 must be kept for 5 years following the date of each record.</p> <p>The records required in 40 CFR Section 63.10432 must be kept onsite for at least 2 years after the date of each record. Each one of these records may be kept offsite for the remaining 3 years.</p>
14.0		CD	40 CFR Section 63.10440; 40 CFR Part 63 Subpart A	<p>Table 1 to Subpart W of Part 63 indicates which parts of the General provisions in 40 CFR Section 63.1 through 63.16 apply.</p>



## COMPLIANCE PLAN **CD-01**

Facility Name: Abbott Northwestern Hospital

Permit Number: 05300061 - 002

**Subject Item:** EU 027 Caterpillar 3516C (10th Ave-Lab)

**Associated Items:** SV 021 Caterpillar 3516C

	NC/ CA	Type	Citation	Requirement
1.0		CD	hdr	EMISSION LIMITS
2.0		LIMIT	40 CFR Section 60.4205(b); 40 CFR Section 89.112; Minn. R. 7011.3520	Carbon Monoxide: less than or equal to 3.50 grams/kilowatt-hour
3.0		LIMIT	40 CFR Section 60.4205(b); 60.4205(b); 40 CFR Section 89.112; Minn. R. 7011.3520	Total Particulate Matter: less than or equal to 0.20 grams/kilowatt-hour
4.0		CD	40 CFR Section 60.4205(b); 60.4205(b); 40 CFR Section 89.112; Minn. R. 7011.3520	NMHC + NOx: less or equal to than 6.40 grams/kilowatt-hour  This is an average emission rate, not a maximum emission rate at all loads. Compliance is demonstrated by maintaining applicable certification from the manufacturer on file.
5.0		LIMIT	40 CFR Section 60.4205(b); 40 CFR Section 89.113; Minn. R. 7011.3520	Opacity: less than or equal to 20 percent opacity during the acceleration mode, less than 15 percent opacity during the lugging mode, and less than 50 percent opacity during the peaks in either the acceleration or lugging modes.
6.0		LIMIT	Minn. R. 7011.2300, subp. 1	Opacity: less than or equal to 20 percent opacity once operating temperatures have been obtained.
7.0		LIMIT	Minn. R. 7011.2300, subp. 2	Sulfur Dioxide: less than or equal to 0.5 lbs/million Btu heat input .  The potential to emit from each GP002 unit is less than 0.002 lb/MMBtu due to equipment design and allowable fuels.
8.0		CD	hdr	OPERATING REQUIREMENTS
9.0		CD	Minn. R. 7007.0800, subp. 2	Permitted Fuel: No. 2 fuel oil with a sulfur content not exceeding 0.0015% by weight.
10.0		LIMIT	Minn. R. 7007.0800, subp. 2	Operating Hours: less than or equal to 300 hours/year using 12-month Rolling Sum for each generator.
11.0		CD	40 CFR Section 60.4206; Minn. R. 7011.3520	Operate and maintain EU027 according to the manufacturer's written instructions or procedures developed by the owner or operator that are approved by the engine manufacturer, over the entire life of the engine.
12.0		CD	hdr	MONITORING AND RECORDKEEPING REQUIREMENTS
13.0		CD	Minn. R. 7007.0800, subp. 2	The Permittee shall keep records of fuel type and hourly usage on a monthly basis.
14.0		CD	Minn. R. 7007.0800, subps. 4 and 5	Fuel Supplier Certification: The Permittee shall obtain and maintain a fuel supplier certification for each shipment of No. 2 fuel oil, certifying that the sulfur content does not exceed 0.0015% by weight.
15.0		CD	40 CFR Section 60.4207(b); 40 CFR Section 80.510(b); 40 CFR Section 63.6590(c); Minn. R. 7011.3520	Fuel Use: EU027 may be operated only on diesel fuel that meets the requirements of 40 CFR Section 80.510(b) for nonroad diesel fuel:  15 ppm maximum sulfur content; Minimum cetane index of 40; and Maximum aromatic content of 35 volume percent
16.0		CD	40 CFR Section 60.4209(a); 40 CFR Section 63.6590(c); Minn. R. 7011.3520	The Permittee shall install a non-resettable hour meter prior to startup of EU027.
17.0		CD	Minn. R. 7007.0800, subp. 4 & 5	Hours of Operation Records: The Permittee shall maintain records of hours of operation on site that document that the unit is an emergency diesel 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.



## COMPLIANCE PLAN **CD-01**

Facility Name: Abbott Northwestern Hospital

Permit Number: 05300061 - 002

18.0		CD	40 CFR Section 60.4211(e); 40 CFR Section 63.6590(c); Minn. R. 7011.3520	EU027 may be operated for the purpose of maintenance checks and readiness testing, provided that the tests are recommended by Federal, State, or local government, the manufacturer, the vendor, or the insurance company associated with the engine. Maintenance checks and readiness testing of such units is limited to 100 hours per year. There is no time limit on the use of EU027 in emergency situations. Anyone may petition the Administrator for approval of additional hours to be used for maintenance checks and readiness testing, but a petition is not required if the Permittee maintains records indicating that Federal, State, or local standards require maintenance and testing of emergency ICE beyond 100 hours per year. Any operation other than emergency operation, and maintenance and testing as permitted in 40 CFR Section 60.4211(e), is prohibited.
19.0		CD	40 CFR Section 60.4214(b); 40 CFR Section 63.6590(c); Minn. R. 7011.3520	Maintain records of the operation of EU027 in emergency and non-emergency service that are recorded through the non-resettable hour meter. Record the time of operation and the reason EU027 was in operation during that time.
20.0		CD	Minn. R. 7007.0800, subps. 4 and 5	During every monthly test of EU027, record the following information: 1) the date, 2) the time the test was started, and 3) the time the test was completed.
21.0		CD	40 CFR Section 63.6590(c); Minn. R. 7011.8150	EU027 is a new affected source as defined under 40 CFR pt. 63, subp. ZZZZ, and the facility is an area source as defined at 40 CFR Section 63.2. The Permittee shall meet the requirements of 40 CFR pt. 63, subp. ZZZZ by meeting the requirements of 40 CFR pt. 60, subp. IIII. No further requirements of 40 CFR pt. 63, subp. ZZZZ apply to EU027 at the time of permit issuance.



Abbott Northwestern Hospital  
Permit No. 05300061-002  
Technical Support Document

## **Attachment 4**

### **Points Calculator**

## Points Calculator

1) AQ Facility ID No.:	05300061	Total Points	50
2) Facility Name:	Abbott		
3) Small business? y/n?	--		
4) DQ Numbers (including all rolled) :	3611		
5) Date of each Application Received:			
6) Final Permit No.	05300061-002		
7) Permit Staff	Sevcik		
8) "Work completed" in which .xls file (i.e. unit 2b, unit 1a, biofuels)?	NA		

<u>Application Type</u>	<u>DQ No.</u>	<u>Qty.</u>	<u>Points</u>	<u>Total Points</u>	<u>Details</u>
Administrative Amendment			1	0	
Minor Amendment			4	0	
Applicability Request			10	0	
Moderate Amendment			15	0	
Major Amendment	3611	1	25	25	
Individual State Permit (not reissuance)			50	0	
Individual Part 70 Permit (not reissuance)			75	0	

### Additional Points

Modeling Review			15	0	
BACT Review			15	0	
LAER Review			15	0	
CAIR/Part 75 CEM analysis			10	0	
NSPS Review	3611	1	10	10	III
NESHAP Review			10	0	
Case-by-case MACT Review			20	0	
Netting			10	0	
Limits to remain below threshold			10	0	
Plantwide Applicability Limit (PAL)			20	0	
AERA review	3611	1	15	15	
Variance request under 7000.7000			35	0	
Confidentiality request under 7000.1300			2	0	

### EAW review

Part 4410.4300, subparts 18, item A; and 29			15	0	
Part 4410.4300, subparts 8, items A & B; 10, items A to C; 16, items A & D; 17, items A to C & E to G; and 18, items B & C			35	0	
Part 4410.4300, subparts 4; 5 items A & B; 13; 15; 16, items B & C; and 17 item D			70	0	
			<b>Add'l Points</b>	<b>25</b>	

Abbott Northwestern Hospital  
Permit No. 05300061-002  
Technical Support Document

## **Attachment 5**

### **Air Quality Dispersion Modeling Protocol**



# Minnesota Pollution Control Agency

520 Lafayette Road North  
St. Paul, MN 55155-4194

# AQDMP-01

## Air Quality Dispersion Modeling (AQDM) Protocol Protocol Form for Criteria Pollutant Modeling

Doc Type: Air Dispersion Modeling

### Guidance Information on Page 12

**Instructions:** Permit applicants required to conduct air dispersion modeling should submit two paper copies of the completed Air Quality Dispersion Modeling Protocol form (AQDMP-01), the Air Quality Dispersion Modeling Protocol Spreadsheet (AQDMPS-01), and all accompanying files to:

Air Quality Permit Document Coordinator  
Minnesota Pollution Control Agency  
520 Lafayette Road North  
St. Paul, MN 55155-4194

Applicants may also submit an electronic version in addition to the two paper copies.

Electronic copies of the forms and accompanying files should be sent to: [AirModeling.PCA@state.mn.us](mailto:AirModeling.PCA@state.mn.us).

## Facility Information

AQ file no.: 253 AQ facility ID no.: 05300061 Today's date (mm/dd/yyyy): 11/11/2011

Three-letter modeling facility ID (ex., ACE, XAK, MEC, NUP, etc.): ANW

Facility name: Abbott Northwestern Hospital

Facility street address: 800 28<sup>th</sup> Street South

City: Minneapolis State: MN Zip code: 55407

Phone: 612-863-4164 Fax: 612-863-2686 E-mail: tim.grote@allina.com

Facility contact: Mr. Timothy B. Grote Protocol prepared by: Mr. Ryan Birkenholz

Contact phone: 612-863-4164 Contact e-mail address: tim.grote@allina.com

County: Hennepin Elevation at facility: 262.1 m

Latitude, Longitude of facility (Dec. degrees): 44.953177 N, 93.261375 W and UTM coordinates, (NAD83, zone 15 extended): x= 479,383.00 m, y= 4977783 m

## Files to accompany protocol

Use the checkboxes to indicate that the following **required** files are included with the completed protocol form.

Please do not use spaces or special characters in the file names or pathways.

- ☒ 1. Sample AERMOD input files for **each** modeled criteria pollutant (\*.inp, \*.adi, \*.ami)  
**\*Note:** Input file should include receptor grid and building downwash (if applicable)
- ☒ 2. BPIPPRM input file (\*.bpi)
- ☒ 3. Elevation files for input into AERMAP (\*.tif (NED files), \*.dem(s))
- ☒ 4. Background data files with concentrations for each applicable pollutant (annual, seasonal, monthly, daily, etc.)
- ☒ 5. AQDMPS-01 spreadsheet
- ☐ 6. **Optional**, but recommended, files and supporting documents (ex., SAM and/or SMS Spreadsheets, images, figures, SIL analysis modeling output files, etc.) – Please list:

## Section A. Purpose for Air Dispersion Modeling and Related Information

1. What is the purpose for conducting the ambient air dispersion modeling (check all that apply)?  
☐ Permit requirement ☐ EAW ☐ EIS ☐ SIP ☐ PSD  
☒ Other – please explain: Cumulative Levels and Effects Analysis
2. What type of air emission permit does this facility currently hold?  
☐ No current permit ☐ Federal (Title V/Part 70) ☒ State ☐ State Registration ☐ Capped ☐ General  
☐ Other: \_\_\_\_\_
3. Will you be applying for a permit or a permit amendment for the project? ☒ Yes ☐ No
4. In 50 words or less, please provide a description of the proposed project:  
Switch backup fuel for GP001 boilers from #6 fuel oil to #2 fuel oil and add insignificant emission units.
5. Is the proposed project subject to PSD? ☐ Yes ☒ No
  - a. If yes, list pollutants: \_\_\_\_\_
  - b. Is this facility considered a major source for PSD: ☐ Yes ☒ No
6. Has the PSD minor source baseline been set for: Hennepin County? ☒ Yes ☐ No
  - a. If yes, for which pollutant(s) and the year(s) it was set (check all that apply)?  
☐ NO<sub>2</sub> \_\_\_\_\_ ☐ PM<sub>10</sub> \_\_\_\_\_ ☐ PM<sub>2.5</sub> \_\_\_\_\_ ☐ SO<sub>2</sub> \_\_\_\_\_  
PSD major source baseline (*PM<sub>2.5</sub> trigger date will be on Oct. 20, 2011, 1 year after F.R. publication date.*)  
☒ NO<sub>2</sub> 1988 ☒ PM<sub>10</sub> 1975 ☒ PM<sub>2.5</sub> 2010 ☒ SO<sub>2</sub> 1975
7. What type of analysis will be conducted (check all that apply)?  
☒ NAAQS/MAAQS ☐ PSD Class II Increments ☐ PSD Class I Increments ☒ SIL Analysis ☐ Screening  
☒ Other: Air Toxics Analysis using Q/CHI method
8. Was MPCA air dispersion modeling staff consulted while completing this form? ☒ Yes ☒ No
  - a. If yes, please list consultation information:  

MPCA staff name: <u>Greg Pratt &amp; Dennis Becker</u>	DQ or tracking no: <u>N/A</u>	Date of consultation (mm/dd/yyyy): _____
Topic of consultation: Several conversations took place between Ryan Birkenholz with Golder Associates and Greg Pratt and Dennis Becker with the MPCA to discuss various issues related to how to model the generators and how to implement the FAR and background approach.		
9. Additional information for this section (if not applicable, place N/A in field):  
N/A

## Section B. EPA Pre-Processors and EPA Post-Processors

1. Will AERMAP be used? ☒ Yes ☐ No  
If no, please explain: \_\_\_\_\_
2. What version of AERMAP is proposed to be used: AERMAP version 11103
  - a. If other, please explain: \_\_\_\_\_
  - b. What type of elevation data will be used:  
☐ NED 1/3 arc second ☒ NED 1 arc second ☐ DEM 7.5 min ☐ DEM 1.0 degree  
☐ Other - Please describe: \_\_\_\_\_  
*All UTM coordinates must be in NAD83, Zone 15 Extended (not NAD27).*

3. Will BPIP-PRIME version 04274 be used? ☒ Yes ☐ No

If no, please explain: \_\_\_\_\_

*Tiering of buildings must follow MPCA's modeling guidance from section 6 of the Oct. 2004 "MPCA Air Dispersion Modeling Guidance For Minnesota Title V Modeling Requirements And Federal Prevention of Significant Deterioration (PSD) Requirements (Version 2.2)."*

4. Will MPCA pre-processed AERMET data be used? ☒ Yes ☐ No If no, proceed to question 5.

**Note** – MPCA's pre-processed meteorological data with AERMET incorporates the following details:

- AERSURFACE version 08009 is used to determine surface characteristics using 1992 LULC data.
- Yearly-averaged moisture conditions (wet, dry, or average) based on historical ranks are accounted for in AERSURFACE to aid in the determination of Bowen ratio values.
- Default 1.0 km radius for surface roughness and 10 km by 10 km domain for albedo and Bowen ratio used in AERSURFACE

- a. If **no**, will on-site meteorological data be processed and used? ☐ Yes ☐ No

*\*If no to question 4a, skip to question 5 and provide additional information in question 6.*

- b. If **yes** to question 4a, please answer the following questions. Otherwise, please move on to question 5.

- i. Will AERSURFACE be used to determine surface characteristics around the meteorological tower? (Default is "Yes") ☐ Yes ☐ No

- ii. What version of AERSURFACE is proposed to be used: (Select from list)

- iii. What LULC data will be used? (Select from list)

If other, please explain: \_\_\_\_\_

- iv. Will yearly-averaged moisture conditions (wet, dry, or average) based on historical ranks be accounted for in AERSURFACE (for the Bowen Ratio)? (Default is "Yes") ☐ Yes ☐ No

- v. Will the default 1.0 km radius for surface roughness, and 10 km by 10 km domain for albedo and Bowen ratio be used? (Default is "Yes") ☐ Yes ☐ No

If no, please explain: \_\_\_\_\_

5. Are any **EPA** post-processors (such as LEADPOST) proposed to be used in the analysis? ☐ Yes ☒ No

- a. If yes, what post-processor(s) and version(s): \_\_\_\_\_

6. Additional information for this section (if not applicable, place N/A in field):

N/A

## Section C. Model Selection and Options (Key CO Pathway Inputs)

1. Identify the air dispersion model and version proposed to be used in the analysis: AERMOD version 11103

- a. If other, please list: \_\_\_\_\_

2. Will alternative air dispersion models and/or methods, as specified by Appendix W, be applied (e.g., parallel version(s) of model, PVMRM/OLM, secondary formation, etc.)? ☒ Yes ☐ No

If yes, please explain: OLM is proposed for use with this project

- a. If yes, will approval be required by MPCA and/or EPA Region V air modeling staff? ☒ Yes ☐ No

If yes, please select: ☒ MPCA (State-only action) ☐ EPA Region V (PSD/SIP action)

If no, please explain: \_\_\_\_\_

3. What criteria pollutants are required to and will be modeled (check all that apply)?

☒ CO ☒ NO<sub>2</sub> ☒ PM<sub>2.5</sub> ☒ PM<sub>10</sub> ☒ SO<sub>2</sub> ☐ Pb ☐ H<sub>2</sub>S ☐ Other: \_\_\_\_\_

*Please refer to **table A.1 and A.2 in the appendix** for averaging times and form of standard for each criteria pollutant(s). Refer to the most recent version of the EPA's AERMOD User's Guide for correct pollutant IDs to use. Use EPA's most recent modeling guidance' methods for PM<sub>2.5</sub>.*

4. What model options are proposed to be used in the analysis for the source under review (check all that apply)?

☒ Regulatory Default - list pollutants: CO, PM2.5, PM10, SO2    ☒ Non-Regulatory Default - List pollutants: NO2  
☐ Concentration   ☐ Rural   ☒ Urban   ☐ Other: \_\_\_\_\_

a. If Urban, please specify population area, population, and surface roughness radius:  
 Population area: Minneapolis    Population: 1,000,000    Surface roughness radius: 1.0 km

b. If Non-Regulatory Default, please specify non-default options: OLM

5. If NO<sub>2</sub> is required to be analyzed for the 1-hour and annual NAAQS, what tier methodology(s) is proposed?  
☐ N/A, NO<sub>2</sub> not required (skip to question 6)  
☐ Tier 1 (100% NO<sub>x</sub> to NO<sub>2</sub> conversion, most conservative)  
☐ Tier 2 (Default ambient ratio of 0.80, or an appropriate ratio value)  
☒ Tier 3 (OLM, requires justification and approval by MPCA and/or EPA Region 5)  
☐ Tier 3 (PVMRM, requires justification and approval by MPCA and/or EPA Region 5)

a. If Tier 2, please provide the ambient ratio proposed (default = 0.80): \_\_\_\_\_

b. If Tier 3 is anticipated to demonstrate compliance in the modeling analysis (OLM or PVMRM), please provide the following details now to expedite MPCA's review:  
 In-stack ratio of NO<sub>2</sub>/NO<sub>x</sub> (NO2STACK) (default=0.50): 0.50  
 Equilibrium ratio (NO2EQUIL) (default=0.90): 0.90

Ozone (Please select option(s)):  
☐ Monitored Value (OZONEVAL): \_\_\_\_\_ Units (OZONUNIT): ug/m^3

☐ MPCA-generated Inverse-Distance Weighted Hourly O<sub>3</sub> File (µg/m<sup>3</sup>) (OZONEFIL)  
☐ File name: \_\_\_\_\_ DMAX: km

☒ MPCA-generated Maximum Hourly Monitored O<sub>3</sub> File (µg/m<sup>3</sup>) (OZONEFIL)  
☒ File name: ANW\$44.9548N\_93.2623W\_20062010\_HOURLY\_OZNE\_ALLSITESviaALLMAX.bkg DMAX: unknown km

☐ Other - please explain: \_\_\_\_\_

c. Is EPA approval needed for the modeling protocol (e.g., Tier 3 NO<sub>2</sub>)? *Tier 3 NO<sub>2</sub> methodologies that require approval by Region 5 modeling staff need to have said approval before submission of this form.*  
☐ Yes – PSD/SIP permit action    ☒ No – State-only action

d. Are the following criteria from Appendix W, section 3.2.2, paragraph (e) met in this protocol?

e. *"Finally, for condition (3) in paragraph (b) of this subsection...an alternative refined model may be used provided that:*

- The model has received a scientific peer review;*
- The model can be demonstrated to be applicable to the problem on a theoretical basis;*
- The data bases which are necessary to perform the analysis are available and adequate;*
- Appropriate performance evaluations of the model have shown that the model is not biased toward underestimates; and*
- A protocol on methods and procedures to be followed has been established."*    ☒ Yes    ☐ No

 If no, please explain: \_\_\_\_\_

6. Additional information for this section (including justification for non-default or additional values listed in 5a or 5b):  
 OLM Source group ALL will be used with the OLM option.

## Section D. Emission Source Characterizations and Parameters (Key SO Pathway Inputs)

Include and list the facility's modeling parameters for all source types in the MPCA's *Modeling Parameters Spreadsheet* (Form AQDMPS-01). For background sources listed within SO Pathway, please see Section I.

- Please indicate which of the following source characterizations are present at your facility and will be included for modeling

analysis (check all that apply ):

“Yes” = Source-type present and will model; “N/A” = Source-type not present; “No” = Source-type present but will not model.

**Subsection I. Point sources:**

☒ Yes ☐ N/A ☐ No please explain: \_\_\_\_\_

- a. Are any of the point sources capped and/or horizontal stacks (see guidance in section 6.1, AERMOD Implementation Guide (03/19/2009)) and accounted for in the following?

☐ No ☒ Yes – exit velocity(s) = 0.001 m/s ☐ Non-Default POINTCAP/POINTHOR\*

\*Please provide justification for use of non-default option in question b, below.

- b. Additional information for this subsection (if not applicable, place N/A in field):

SV06 is at a 45 degree angle, velocity will equal maximum velocity \* Sin(45°).

The emergency and peaking generators are limited to 300 hours per year. Because operation is typically only for maintenance and readiness testing, two operating scenarios are proposed. Scenario A will assume that each engine is tested for one hour each month. This will be implemented in the model by using an hourly emission rate file. Scenario A will be used to determine the significant impact radius and any impacts over the SIL will be compared to the NAAQS. To address the 300 hour per year limit on the generators, Scenario B will be modeled using an emission rate scalar of (300/8760) to represent 300 hours of run time per year. Scenario B will not be used for the significant impact radius models, but will be compared to the NAAQS for any significant impacts.

**Subsection II. Volume sources:**

☐ Yes ☒ N/A ☐ No please explain: \_\_\_\_\_

Please refer to figure A.1 in the appendix on calculating the lateral and vertical dimensions.

- a. Will there be any volume source(s) overlapping or within 1.0 meters of any receptors?

☐ No ☐ Yes\*

\*Volume source should be converted to an area source of commensurate size (per section 6.2 of the latest AERMOD Implementation Guide (03/19/2009)) or be further refined.

- b. Additional information for this subsection (if not applicable, place N/A in field):

**Subsection III. Area sources (includes AREACIRC and AREAPOLY):**

☐ Yes ☒ N/A ☐ No please explain: \_\_\_\_\_

- a. Additional information for this subsection (if not applicable, place N/A in field):

**Subsection IV. Open pit sources:**

☐ Yes ☒ N/A ☐ No please explain: \_\_\_\_\_

- a. Additional information for this subsection (if not applicable, place N/A in field):

2. Are fugitive emissions emitted from the source and will they be accounted for in the modeling analysis?

(Examples of fugitive emissions include but are not limited to: traffic on paved and/or unpaved roads, stockpiles of various materials, wind erosion, loadout, unloading, etc.)

☐ Yes ☒ N/A ☐ No please explain: \_\_\_\_\_

- a. If yes, please list the facilities' fugitive sources: \_\_\_\_\_

Note: If modeling for paved road fugitive dust, please read and complete Section E.

- b. Will the Standardized Mobile Source (SMS) Spreadsheet be used to determine emissions due to paved and/or unpaved roads (unpaved spreadsheets under development)? ☐ Yes ☐ No

3. Will all insignificant activities emitted from the source for PM<sub>10</sub>, with emissions over 0.1 lb/hr and for PM<sub>2.5</sub>, with emissions over 0.02 lb/hr, be accounted for in the modeling?

☒ Yes ☐ N/A ☐ No please explain: \_\_\_\_\_

\* Please provide justification for excluding any fugitive and/or insignificant activities within the modeling.



Please scale for other pollutants. For example,  $(0.1 \text{ lb/hr}) / (150 \mu\text{g}/\text{m}^3) = (X \text{ lb/hr}) / (35 \mu\text{g}/\text{m}^3)$ , where  $X = 0.02 \text{ lb/hr}$ .

Refer to guidance in section 10 of the Oct. 2004 "MPCA Air Dispersion Modeling Guidance For Minnesota Title V Modeling Requirements And Federal Prevention of Significant Deterioration (PSD) Requirements (Version 2.2)"

4. Will all applicable PSD increment consuming and/or expanding sources be modeled for your source?  
☐ Yes ☒ N/A ☐ No please explain: \_\_\_\_\_
5. Will emission factors/scalars be used to demonstrate compliance in the air dispersion modeling analysis? ☒ Yes ☐ No  
If yes to a., describe which sources and the types of emission factors/scalars that will be applied:  
Emission factor scalars will be used for the generators in Scenario B. No emission factor scalars are used in Scenario A, however an hourly emission rate file is used in Scenario A.
6. Will NO<sub>2</sub>/NO<sub>x</sub> ratios be provided, source-by-source, for OLM/PVMRM options? ☐ N/A ☐ Yes ☒ No
7. Will "OLMGROUP ALL" be used for OLM option? ☐ N/A ☒ Yes ☐ No
8. Additional information for this section (if not applicable, place N/A in field):

## Section E. Paved Roads Fugitive Dust (Optional)

Current MPCA policy regarding modeling of paved road fugitive dust emissions, in support of air quality permitting or environmental review, recommends that:

New facilities or facilities undergoing physical expansions will not be required to model paved road fugitive dust emissions if a facilities' predicted ambient impacts for PM<sub>10</sub> and PM<sub>2.5</sub> are less than a specified % of the NAAQS and/or PSD Class II Increment. This policy does not apply to modeling that supports permitting in maintenance areas or the development of State Implementation Plans. Exceptions to the policy can and will occur.

If paved road fugitive dust emissions are proposed to be included in your modeling analysis and you did **not** answer "No" to question 1b, MPCA guidance recommends that the source in question first model its' facility **without** including paved road fugitive dust emissions. Results then can be recorded using Table E-01 below for PM<sub>10</sub> and PM<sub>2.5</sub> (NAAQS modeling must include background concentrations).

1. Does your facility have paved road fugitive dust emissions for PM<sub>10</sub> and PM<sub>2.5</sub>?  
☐ Yes ☒ No – Please continue to the next section (F)  
a. Will your facility include paved road fugitive dust emissions for modeling? ☐ Yes ☐ No  
b. Is your facility either a new source or an existing facility undergoing a physical expansion?  
☐ New source ☐ Existing w/ phys. expan. ☐ No\*  
\*If no, please answer questions 2 – 4 only as necessary and then proceed to the next section.  
c. If yes to question 1 and no to question 1a, please provide justification for not including paved road fugitives: \_\_\_\_\_
2. How many vehicles per day drive on and off your facility's property?  
Employee traffic and parking: \_\_\_\_\_ Third-party truck traffic: \_\_\_\_\_
3. Will you be using the most recent version of the MPCA's Standardized Mobile Source (SMS) spreadsheet to determine paved road fugitive dust emissions and source parameters?  
☐ Yes\* ☐ No \*If yes, please submit SMS with this modeling protocol form and indicate on the cover page of this form.
4. Additional information for this section (if not applicable, place N/A in field):

**Note:** Modeling and completing the tables below are optional for this form. However, results must be provided with the modeling analysis results in the permit application, to support or not support the inclusion paved road fugitive dust sources in the analysis.

Table E-01

Averaging Period	NAAQS ( $\mu\text{g}/\text{m}^3$ )	Modeled NAAQS Impact Concentrations ( $\mu\text{g}/\text{m}^3$ )	% of NAAQS	PSD Class II Increments ( $\mu\text{g}/\text{m}^3$ )	Modeled Class II Increment Impact Concentrations ( $\mu\text{g}/\text{m}^3$ )	% of Class II Increments
------------------	------------------------------------	--	------------	--	---	--------------------------

PM <sub>10</sub>	24-hour	150		0.00%	30		0.00%
	Annual	50		0.00%	17		0.00%
PM <sub>2.5</sub>	24-hour	35		0.00%	9		0.00%
	Annual	15		0.00%	4		0.00%

Table E-02 indicates the resultant category(s) for your facility, based on the % of the standard(s) for PM<sub>10</sub> and PM<sub>2.5</sub> (see results in columns “% of NAAQS” and “% of Class II Increments” in Table 1F-01 above). This uses the highest % from all averaging periods for each pollutant and standard. The category descriptions are provided in Table E-03. Answers to question 2 above will help determine permit conditions if modeled concentrations result in a category 2 designation.

**Table E-02**

	NAAQS				PSD Class II Increments			
	NAAQS Result(s) w/ Background	Cat. 1	Cat. 2	Cat. 3	PSD Class II Result(s)	Cat. 1	Cat. 2	Cat. 3
PM <sub>10</sub>	0.00	# < 60%	60% < # < 95%	95% < #	0.00	# < 35%	35% < # < 75%	75% < #
PM <sub>2.5</sub>	0.00	# < 80%	80% < # < 95%	95% < #	0.00	# < 40%	40% < # < 80%	80% < #

**Table E-03**

Cat 1:	Paved road fugitive emissions not required to be modeled, and no paved road fugitive dust permit conditions.
Cat 2:	Paved road fugitive emissions not required to be modeled, with paved road fugitive dust permit conditions determined by levels of traffic at the facility.
Cat 3:	Paved road fugitive emissions <b>are</b> required to be modeled, with site-specific paved road fugitive dust permit conditions. Re-modeling and/or addition of paved road fugitive emissions source group required.

## Section F. Receptors (RE Pathway)

Please refer to guidance from Table 4 and 5 of the October 2004 “MPCA Air Dispersion Modeling Guidance For Minnesota Title V Modeling Requirements And Federal Prevention of Significant Deterioration (PSD) Requirements (Version 2.2)”, as well as federal guidance.

- What type of receptor grid will be used? Discrete Cartesian
  - If other or a combination, please describe: \_\_\_\_\_
- How many # receptors in total will be in the receptor grid? unknown - as many as it takes to capture the SIL
- What will be the grid dimensions? (Ex., radius of 10 km, 5 km by 5 km, etc.) \_\_\_\_\_
- What is the proposed spacing of receptors for...?
  - Inside the property boundary(s): 50 meters
  - On the fenceline(s): N/A meters
  - On the property line(s): 25 meters
  - Beyond the property line(s): 100 to 2km 500 to 5km meters
- Will FLAGPOLE receptors be included in the receptor grid?
 

☐ Yes ☐ N/A ☒ No – Please continue to the next section (F)
- Additional information for this section (if not applicable, place N/A in field):
 

Flagpole receptors were discussed with MPCA staff. Initially, the MPCA requested flagpole receptors at air intakes. This model does not have an ambient air boundary, therefore any air intakes at ground level are already accounted for in the receptor grid. Because the NAAQS were not ever intended to apply to indoor air, it is not appropriate to place flagpole receptors at elevated air intakes at the Hospital in the NAAQS models. The inclusion of flagpole receptors in the air toxics model will be discussed with the MPCA when the air toxics modeling is being conducted.

## Section G. Meteorological Data (ME Pathway)

- What meteorological surface station is proposed for use? Please indicate the three letter call sign, station name and the

state the surface station is located in. (Ex.: MSP: Minneapolis/St. Paul, MN)

Pre-processed AERMET version 06341 or earlier files: (Select from list, \*DLH-\*SXF)

Pre-processed AERMET version 11059, with or (Select from list, ABR-GPZ)

without AERMINUTE version 11059 processing, files: MSP, Minneapolis/St. Paul Int'l Arpt, MN

Other:

2. What meteorological upper air station was used? MPX: Twin Cities/Chanhassen, MN

3. What consecutive 5- year period will be used? 2006 - 2010

a. If other, please specify:

### Subsection I: On-Site Meteorological Data

**Note:** If site-specific meteorological data will be collected and used, please follow the federal guidance (EPA's), as specified in section 8.3 and section 8.3.3.2 (QA/QC) of 40 CFR Part 51 dated 11/09/2005 (Appendix W).

a. If site-specific meteorological data will be collected and used, where will the **location** of the meteorological tower be set (city and state, coordinates, etc.)?

N/A

b. If site-specific meteorological data will be collected and used, what **year** of data is proposed to be used?

N/A

4. What justification(s) applies for the proposed surface and upper air stations identified above? (Check all that apply)

☒ Similar surface characteristics as meteorological tower ☐ Similar land use characteristics

☒ Similar wind patterns/characteristics ☒ Proximity to surface and/or upper air station(s)

☐ Other – Please describe:

a. Please provide additional detail for your justifications:

5. Will wind speed categories be used?

☐ Yes ☒ No – Skip to question 6.

a. If yes, please list the user-specified wind speed categories for the ME WINDCATS pathway:

b. If yes, please list the user-specified wind speed emission factors for the SO EMISFACT WSPEED pathway:

6. Additional information for this section (if not applicable, place N/A in field):

## Section H. SIL Analysis and Results

1. Will a SIL analysis be conducted in conjunction with this project, in order to determine if a cumulative analysis is required?

☐ N/A – Proceed to the next section (I)

☐ No – Will not model against SILs and instead proceed directly to conducting a cumulative analysis

☒ Yes – List for which pollutants: CO, SO<sub>2</sub>, PM<sub>10</sub>, PM, NO<sub>2</sub>

2. Extent of SIL receptor grid: 20 km

3. If a preliminary SIL analysis has been conducted for this project, it is optional but recommended that results be provided (in the table below) including corresponding model output files.

### Class II Significant Impact Levels Modeling Results for:

Pollutant	Averaging Time	Modeled Impacts (H1H) (µg/m <sup>3</sup> )	SILs (µg/m <sup>3</sup> ) *As of 10/26/2010	% of SIL	Exceed SIL?	Radius of Impact (If exceeds SIL)
SO <sub>2</sub>	1-hr	1.50	7.83	19.16%	No - Complete	km
	3-hr	0.70	25	3.00%		
	24-hr	0.30	5	6.00%		

	<i>Annual</i>	0.10	1	10.00%		
<b>PM<sub>10</sub></b>	<i>24-hr</i>	4.30	5	86.00%	No - Complete	km
	<i>Annual</i>	0.80	1	80.00%		
<b>PM<sub>2.5</sub></b>	<i>24-hr</i>	3.20	1.2	266.70%	Yes - Refined Modeling	0 km
	<i>Annual</i>	0.70	0.3	233.30%		
<b>NO<sub>x</sub></b>	<i>1-hr</i>	373.10	7.52	4961.44%	Yes - Refined Modeling	6 km
	<i>Annual</i>	9.50	1	950.00%		
<b>CO</b>	<i>1-hr</i>	241.40	2000	12.00%	No - Complete	km
	<i>8-hr</i>	76.20	500	15.00%		

4. Additional information for this section (if not applicable, place N/A in field):  
This project is likely to exceed the SIL for each pollutant based on H1H impacts.

## Section I. Background Values

Please refer to pages 35-39 and Table B-4 of the "AERMOD User's Guide, Addendum for Version 11103" for guidance as well as the latest version of the MPCA's Air Dispersion Modeling Guidance for Title V and PSD.

**\*Contact MPCA air dispersion modeling staff for MPCA-generated products.**

1. Are background concentrations required for your analysis?  
☒ Yes – List pollutants required for: CO, SO2, PM10, PM, NO2  
☐ No – Please explain and proceed to question 3 (e.g., SIL analysis-only, etc.):

**a. Will MPCA-generated background concentrations be used?**

- ☐ No ☒ Yes – List pollutants required for: NO2, PM2.5

If yes, check MPCA-generated background concentrations option(s) to be used:

- ☒ SO BACKGRND BGflag (BGflag can be defined as ANNUAL, SEASON, MONTH, etc. See Table B-4, Appendix B, of the AERMOD User's Guide Addendum)

BGflag(s): SEASON

- ☒ SO BACKGRND HOURLY

File name(s): [Pollutant]\_ALLSITESvia1overR.bkg

File creation date(s) & time(s): 9/29/2011 11:37AM

Radius Maximum (RMAX): km

- ☐ Uniform background concentration(s)

**b. Will user-generated background concentrations be used?**

- ☒ No ☐ Yes – List pollutants required for:

If yes, check user-generated background concentrations option(s) to be used:

- ☐ SO BACKGRND BGflag (BGflag can be defined as ANNUAL, SEASON, MONTH, etc. See Table B-4, Appendix B, of the AERMOD User's Guide Addendum)

BGflag(s):

- ☐ SO BACKGRND HOURLY

File name(s):

File creation date(s) & time(s):

Radius Maximum (RMAX): km

- ☒ Uniform background concentration(s)

**c. If yes to question 1b above, please provide additional information regarding the development of user-generated background concentrations.**

Background value(s) developed from: ☐ MPCA website ☐ EPA website

☐ Other – explain:

Examined monitors out to a distance of: km

Facility setting: ☐ Urban ☐ Suburban ☐ Rural

Facility land use (industrial, residential, agricultural, cropland, mixed, etc.):

Monitor setting: ☐ Urban ☐ Suburban ☐ Rural

Monitor land use (industrial, residential, agricultural, cropland, mixed, etc.):

Form of background value(s) (maximum, 98<sup>th</sup> percentile, etc.): \_\_\_\_\_ km

2. If "SO BACKGROUND BGflag ANNUAL" or user-developed uniform background concentrations will be used, please input the background concentrations in the table below. (ANNUAL in this context means uniform value; it does not mean annual average.)

Pollutant	Uniform Background Concentrations						
	Averaging Time Periods						
	½-Hour	1-Hour	3-Hour	8-Hour	24-Hour	Rolling 3-month	Annual
SO <sub>2</sub>	-			-		-	
PM <sub>10</sub>	-	-	-	-		-	
PM <sub>2.5</sub>	-	-	-	-		-	
NO <sub>x</sub>	-		-	-	-	-	
CO	-		-		-	-	-
Pb	-	-	-	-	-		-
H <sub>2</sub> S		-	-	-	-	-	-
Other -							

3. Additional information for this section (if not applicable, place N/A in field):

## Section J. Nearby Sources

### \*Contact MPCA air dispersion modeling staff for MPCA-generated products.

1. Will any nearby sources be modeled explicitly for the analysis?

☐ N/A ☒ No ☐ Yes – List pollutants required for: \_\_\_\_\_

**a. Will MPCA-generated nearby sources be used?**

☐ N/A ☐ No ☒ Yes – List pollutants required for: NO<sub>2</sub>, PM<sub>2.5</sub>

*If yes, check MPCA-generated near sources option(s) to be used:*

☐ Refined nearby source modeling Within \_\_\_\_\_ km of subject facility

List nearby sources: \_\_\_\_\_

☒ First-approximation representative (FAR) data

File name(s): ANW\$44.9548N\_93.2623W\_2005NElandFAR2G\_[POLLUTANT]\_.far

Creation date: 9/29/2011 Creation time: 11:37

Distance (DMAX): unk Scalar (SMAX): unk

Significance level: unk Coef. \* D test: unk

**b. Will user-generated nearby sources be used?**

☐ N/A ☒ No ☐ Yes – List pollutants required for: \_\_\_\_\_

*If yes, check user-generated near sources option(s) to be used:*

☐ Refined nearby source modeling Within \_\_\_\_\_ km of subject facility

List nearby sources: \_\_\_\_\_

☐ First-approximation representative (FAR) data

File name(s): \_\_\_\_\_

Creation date: \_\_\_\_\_ Creation time: \_\_\_\_\_

Distance (DMAX): \_\_\_\_\_ Scalar (SMAX): \_\_\_\_\_

Significance level: \_\_\_\_\_ Coef. \* D test: \_\_\_\_\_

2. Additional information for this section (if not applicable, place N/A in field):

## Appendix

Figure A.1

TABLE 3-1.		
SUMMARY OF SUGGESTED PROCEDURES FOR ESTIMATING INITIAL LATERAL DIMENSIONS $\sigma_{y0}$ AND INITIAL VERTICAL DIMENSIONS $\sigma_{z0}$ FOR VOLUME AND LINE SOURCES		
Type of Source	Procedure for Obtaining Initial Dimension	
(a) Initial Lateral Dimensions ( $\sigma_{y0}$ )		
Single Volume Source	$\sigma_{y0} =$	length of side divided by 4.3
Line Source Represented by Adjacent Volume Sources (see Figure 1-8(a) in EPA, 1995)	$\sigma_{y0} =$	length of side divided by 2.15
Line Source Represented by Separated Volume Sources (see Figure 1-8(b) in EPA, 1995)	$\sigma_{y0} =$	center to center distance divided by 2.15
(b) Initial Vertical Dimensions ( $\sigma_{z0}$ )		
Surface-Based Source ( $h_s = 0$ )	$\sigma_{z0} =$	vertical dimension of source divided by 2.15
Elevated Source ( $h_s > 0$ ) on or Adjacent to a Building	$\sigma_{z0} =$	building height divided by 2.15
Elevated Source ( $h_s > 0$ ) not on or Adjacent to a Building	$\sigma_{z0} =$	vertical dimension of source divided by 4.3

Table A.1 – Modeled Form of the NAAQS/MAAQs for Averaging Periods

Pollutant	1-hour	3-hour	8-hour	24-hour	Monthly	Annual
CO	H2H	-	H2H	-	-	-
NO <sub>2</sub>	98 <sup>th</sup> percentile of the daily max. 1-hour values	-	-	-	-	H1H
Pb	-	-	-	-	H1H	-
PM <sub>10</sub>	-	-	-	H6H of the multiyear values	-	H1H
PM <sub>2.5</sub>	-	-	-	98 <sup>th</sup> percentile of daily max. 24-hour values	-	H1H
SO <sub>2</sub>	99 <sup>th</sup> percentile of the daily max. 1-hour values	H2H	-	H2H	-	H1H

Table A.2 – Modeled Form of PSD Increment for Averaging Periods

Pollutant	1-hour	3-hour	24-hour	Annual
NO <sub>2</sub>	-	-	-	H1H
PM <sub>10</sub>	-	-	H2H	H1H
PM <sub>2.5</sub>	-	-	H2H*	H1H
SO <sub>2</sub>	-	H2H	H2H	H1H

*Criteria pollutants modeled for SIL analyses should be modeled as H1H's.*

## Helpful Webpages and Documents/Guidance

Please consult the following webpages and documents for the most current modeling guidance and recommendations when filling out this form:

- U.S. EPA's Support Center for Regulatory Atmospheric Modeling: <http://www.epa.gov/scram001/>  
**Please check the SCRAM webpage regularly for the most recent updates to guidance, models, and standards; especially, for modeling guidance related to: 24-hour PM<sub>2.5</sub>, 1-hour NO<sub>2</sub>, and 1-hour SO<sub>2</sub> NAAQS.**
- U.S. EPA's 40 CFR Part 51 Appendix W: [http://www.epa.gov/ttn/scram/guidance/guide/appw\\_05.pdf](http://www.epa.gov/ttn/scram/guidance/guide/appw_05.pdf)
- U.S. EPA's AERMOD Implementation Guide: [http://www.epa.gov/ttn/scram/7thconf/aermod/aermod\\_implmnt\\_guide\\_19March2009.pdf](http://www.epa.gov/ttn/scram/7thconf/aermod/aermod_implmnt_guide_19March2009.pdf)
- U.S. EPA's AirData: <http://www.epa.gov/air/data/index.html>
- MPCA's Air Dispersion Modeling: <http://www.pca.state.mn.us/nwqh421>
- MPCA's Ambient Air Monitoring Network Plan: <http://www.pca.state.mn.us/mvri439>
- USGS' National Map Seamless Viewer (NED data): <http://seamless.usgs.gov/website/seamless/viewer.htm>

For questions on this form, or data requests from MPCA air dispersion modeling staff, please send an e-mail to: [AirModeling.PCA@state.mn.us](mailto:AirModeling.PCA@state.mn.us). Please be sure to include with your questions or requests: the form ID (ADQM-01), facility name and permit #, and contact information.

Questions can also be asked by calling one of the MPCA's air dispersion modeler's (phone numbers are listed on the MPCA's Air Dispersion Modeling webpage, link above).

**Note:** Please be sure to use UTM Coordinates, NAD83, Zone 15 Extended for all locational data.

Under-Development by MPCA Staff:

Procedures and data involving the following subject areas are under-development and therefore, MPCA air dispersion modeling staff should be contacted (via the email address above) to discuss data files, methods, and/or procedures for:

- Standardized Air Modeling (SAM) Spreadsheet and/or Standardized Mobile Source (SMS) Spreadsheet
- Background concentration data
- Nearby sources
- Pre-processed AERMET meteorological data files
- Ozone data generated for Tier 3 NO<sub>2</sub> modeling

### Acronyms

AERMAP

AERMET

AERMOD

AERSURFACE

Air Quality (AQ)

Air Quality Dispersion Modeling Protocol form (AQDMP-01)

Air Quality Dispersion Modeling Protocol Spreadsheet (AQDMPS-01)

BPIP-PRIME

Carbon Dioxide (CO)

Digital Elevation Model (DEM)

Environmental Assessment Worksheet (EAW)

Environmental Impact Statement (EIS)

U.S. Environmental Protection Agency (EPA)

Hydrogen Sulfide (H<sub>2</sub>S)

Kilometer (km)

Minnesota State Ambient Air Quality Standard (MAAQS)

Minnesota Pollution Control Agency (MPCA)

National Ambient Air Quality Standard (NAAQS)

National Elevation Dataset (NED)

Nitrogen Dioxide (NO<sub>2</sub>)

Particulate Matter less than 10 um in size (PM<sub>10</sub>)

Particulate Matter less than 2.5 um in size (PM<sub>2.5</sub>)

Lead (Pb)

POINTCAP

POINTHOR

Prevention of Significant Deterioration Program (PSD)

Plume Volume Molar Ratio Method/Ozone Limiting Method

(PVMRM/OLM)

Standardized Air Modeling (SAM)

Significant Impact Level (SIL)

Sulfur Dioxide (SO<sub>2</sub>)

State Implementation Plan (SIP)

Standardized Mobile Source (SMS)

Universal Transverse Mercator (UTM)

Abbott Northwestern Hospital  
Permit No. 05300061-002  
Technical Support Document

## **Attachment 6**

### **Air Quality Dispersion Modeling Protocol Review Form**





**Minnesota Pollution  
Control Agency**

520 Lafayette Road North  
St. Paul, MN 55155-4194

# AQDMPRF-01

AQDM Protocol Review Form  
for Criteria Pollutant Modeling  
Air Quality Dispersion Modeling (AQDM)

*Doc Type: Air Dispersion Modeling*

**Publication document # \_\_\_\_\_**

**Instructions:** This form is used for Minnesota Pollution Control Agency (MPCA) internal use by Air Dispersion Modeler and Air Permit Engineers to review for Criteria Pollutant Modeling.

## Protocol Information

Today's date (mm/dd/yyyy): 12/19/2011 Today's date (mm/dd/yyyy): 12/19/2011  
MPCA Air Dispersion Modeler: Greg Pratt MPCA Air Permit Engineer: Sarah Sevcik  
Air quality file number: 253 Air quality ID number: 05300061  
Three-letter modeling facility ID (ex., ACE, XAK, MEC, NUP, etc.): ANW  
Facility name: Abbott Northwestern Hospital  
Date protocol was received at the MPCA (mm/dd/yyyy): 11/21/2011  
Project name: Permit Amendment

## Approval of Modeling Protocol by Sections - Completed by Air Dispersion Modeler

Section and section name	Acceptable/ Unacceptable	Deficiencies and/or comments
Files to accompany Protocol	Acceptable	
<b>Section A:</b> Purpose for air dispersion modeling and related information	Acceptable	
<b>Section B:</b> EPA Pre-processors and EPA Post-processors	Acceptable	
<b>Section C:</b> Model selection and options (Key CO pathway inputs)	Acceptable	
<b>Section D:</b> Emission source characterizations and parameters (Key SO pathway inputs)	Acceptable	The emission rates identified in the protocol were found to be in error. The corrected emission rates will be used in the modeling analysis, and the deviation from the protocol noted in the modeling report.
<b>Section E:</b> Paved roads fugitive dust	Acceptable	
<b>Section F:</b> Receptors (RE pathway)	Acceptable	Flagpole receptors were not included. Locations for potential flagpole receptors were suggested. The consultant to the proposer submitted a file of flagpole receptors to be included in the analysis. The flagpole receptors will not be used in the development of contours of ground level concentrations.
<b>Section G:</b> Meteorological data (ME pathway)	Acceptable	
<b>Section H:</b> SIL analysis and results	Acceptable	The protocol lists the radius of impact for PM2.5 as 0 km. I'm assuming this is an oversight and will be taken care of in the refined modeling.
<b>Section I:</b> Background values	Acceptable	
<b>Section J:</b> Nearby sources	Acceptable	
<b>Section K:</b> Anticipated outputs (OU pathway)	Acceptable	

<b>AQDMPS-01 Form</b>	Acceptable	The protocol does not reflect the latest modeling scenarios for emissions and for flagpole receptors. The consultant to the proposer indicated that they would like to proceed with the existing protocol and note the deviations in the modeling report.
<b>Modeling Protocol is:</b>	<b>Approved</b>	

### Approval of Modeling Protocol by Sections - Completed by Air Permit Engineer

Section and section name	Acceptable/ Unacceptable	Deficiencies and/or comments
<b>Section D:</b> Emission source characterizations and parameters (Key SO pathway inputs)	Acceptable	Section D.3. This has been checked 'Yes'. Does this mean there are IAs that will be included in the modeling? It appears there are no insignificant activities information in the emission calculations or in other modeling parameter descriptions. If no IAs are to be included in modeling, this section is considered 'acceptable'. If there are insignificant activities that are to be modeled, the modeling parameters need to be provided in the protocol.
<b>Section E:</b> Paved roads fugitive dust	Acceptable	Not applicable
<b>AQDMPS-01 Form</b>	Acceptable	Emission rates and other source parameters are conditionally acceptable. Corrections will need to be included and described in the final modeling report and permit application materials, as follows:  PM/PM10/PM2.5 emission rates for fuel oil combustion in boilers will be corrected to include condensables.  PM2.5 emission rates for emergency generators will be corrected to include condensable fraction.  The modeled carbon monoxide emission rate for SV 001 and SV008 will be based on natural gas emission rates rather than the fuel oil, as this represents the worst case CO emission rate for these stacks.
Comments on other sections:		
<b>Modeling Protocol is:</b>	<b>Approved</b>	

Abbott Northwestern Hospital  
Permit No. 05300061-002  
Technical Support Document

## **Attachment 7**

### **Air Quality Dispersion Modeling Report**



# AIR DISPERSION MODELING CONCENTRATION ANALYSIS

FOR

Allina Health System

Abbott Northwestern Hospital

**Submitted To:** Abbott Northwestern Hospital

**Submitted By:** Golder Associates Inc.  
1751 W. County Road B, Suite 105  
Roseville, MN 55113 USA

**Distribution:** Abbott Northwestern Hospital  
Golder Associates Inc.

March 2012

Project No. 103-81295

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## Executive Summary

This air dispersion modeling report is being submitted to the Minnesota Pollution Control Agency to comply with Minnesota Statute 116.07 Subdivision 4a in connection with a permit modification for Abbott Northwestern Hospital. Dispersion modeling is not required by any federal or state regulation other than this statute. The results show that the hospital is in compliance with the National Ambient Air Quality Standards after the proposed modification.

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## Definitions

Abbott	Abbott Northwestern Hospital
Allina	Allina Health System (parent company that owns Abbott)
BPIP	Building Profile Input Program
CO	Carbon Monoxide
EPA	Environmental Protection Agency
Facility	Abbott Northwestern Hospital and the 10 <sup>th</sup> Avenue Lab Facility
MPCA	Minnesota Pollution Control Agency
NAAQS	National Ambient Air Quality Standards
NO <sub>2</sub>	Nitrogen Dioxide
NO <sub>x</sub>	Oxides of Nitrogen
PM <sub>2.5</sub>	Particulate Matter Less than 2.5 microns
PM <sub>10</sub>	Particulate Matter Less than 10 microns
SIL	Significant Impact Level
SIR	Significant Impact Radius
SO <sub>2</sub>	Sulfur Dioxide
USGS	United States Geologic Survey

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## 1.0 INTRODUCTION

Golder Associates Inc. (Golder) performed an air dispersion modeling concentration analysis to determine the maximum ground level concentrations of carbon monoxide, nitrogen dioxide, particulate matter less than 10 microns, particulate matter less than 2.5 microns and sulfur dioxide from emission units at the Abbott Northwestern Hospital (Hospital) and the Allina Hospitals and Clinics Labs (Lab) collectively described herein as the Facility. The Facility is owned and operated by Allina Hospitals and Clinics (Allina). This air modeling concentration assessment is required to comply with Minnesota Statute 116.07 Subdivision 4a. This air modeling concentration assessment is not required by any other federal or state regulation.

The Facility consists of the following groups and emission units:

- Group 001 – Four boilers (EU01-EU04) provide steam heating for all Hospital buildings except the Allina Heart Hospital (Heart Hospital). Typically fueled by natural gas, these boilers are equipped to use Number 2 (distillate) fuel oil, primarily as a backup fuel.
- Group 002 – Six internal combustion engine-generators (EU05-EU10) provide backup electrical generation and are fueled by distillate fuel oil. Five of the engines (EU05-EU09) currently participate in the Xcel peak shaving program; however the Hospital will discontinue participation in the Xcel peaking program and will relegate these engine-generators for emergency use only as part of this permit modification. EU10 is classified as an emergency engine-generator and is periodically operated only for maintenance and readiness testing or in the event of an electrical interruption.
- Group 003 – Four boilers (EU11-EU14) provide steam heating for Heart Hospital. Typically fueled by natural gas, boilers are equipped to use distillate fuel oil, primarily as a backup fuel.
- Group 004 – Four internal combustion engine-generators (EU15-EU18) provide backup electrical generation and are fueled by distillate fuel oil. These engines are classified as emergency engine-generators and are periodically operated for maintenance and readiness testing or in the event of an electrical interruption.
- Group 005 – Ten natural gas fired boilers provide building heat and hot water for the 10<sup>th</sup> Avenue parking garage and the Lab. These boilers are being permitted for the first time in this permit amendment. The two boilers (EU19 and EU20) heat the parking garage. These boilers were included in the purchase of the parking garage and are considered an insignificant modification. The other eight boilers/ water heaters provide steam and hot water to the Lab. One boiler is classified an insignificant activity under Minnesota Rule 7007.1300 Subpart 3(I) due to emission levels below the listed limits. This insignificant boiler is not assigned an emission unit number is not included in the model. The remaining seven boilers at the Lab (EU21-EU26, and EU28) are classified as insignificant under Minnesota Rule 7007.1300 Subpart 3(G) because they only support the Lab. EU21-EU26, and EU28 are included in the model due to their size even though they are classified as insignificant.
- EU27 – EU27 is classified as an emergency engine-generator and is periodically operated only for maintenance and readiness testing or in the event of an electrical interruption. EU27 supports the Lab and is included in the model due to its size even though it is classified as insignificant.

This Facility is taking voluntary limits to remain a minor source under Part 70 and is therefore eligible for an Individual State Operating Permit. See the permit application for more details on the requested modifications.

The air modeling concentration analysis considers the following pollutants and averaging times:

- National Ambient Air Quality Standards/Minnesota Ambient Air Quality Standards
  - Carbon Monoxide, CO (1-hr and 8-hr)
  - Nitrogen Dioxide, NO<sub>2</sub> (1-hr, and annual)
  - Particulate Matter less than 10 microns, PM10 (24-hr)
  - Particulate Matter less than 2.5 microns, PM2.5 (24-hr and annual)
  - Sulfur Dioxide (1-hr, 3-hr, 24-hr, and annual)
  - Lead (monthly)

The following sections describe the methods and assumptions used for the air modeling analyses and provide a summary of the air modeling results. A modeling protocol was developed and submitted to the Minnesota Pollution Control Agency (MPCA) on August 29, 2011. The model protocol was reviewed by the MPCA and a review form provided on October 6, 2011 requesting that a new protocol be submitted. A new protocol was submitted on November 11, 2011 and was conditionally approved by the MPCA on December 19, 2011.

## 2.0 MODELING METHOD

### 2.1 Facility Information

The Facility is located at 800 28<sup>th</sup> Street East in Minneapolis, Hennepin County, Minnesota (See Figure 1 for a site location map).

A summary of the emission rates and source parameters used for the modeling analysis is presented in Table A0.

Stack and building locations and building heights are based on information provided by Allina and from site reconnaissance. The Facility layout and building heights are presented in Figures 2A, 2B, and 2C. Detailed information about the building coordinates, base elevation, and roof heights are defined in the BPIP input file and included in the electronic submittal.

### 2.2 Air Model Selection

The latest available version of the AMS/EPA Regulatory Model (AERMOD, version 11103)<sup>1</sup> is used for the air modeling. The EPA regulatory default options were used to predict maximum ground level concentrations for CO, NO<sub>2</sub>, PM10 and PM2.5. The 1-hour NO<sub>2</sub> model uses the urban option because more than 50% of the land use within 3 km of the Facility is urban.

### 2.3 Building Downwash

The latest version of the EPA Building Profile Input Program with Plume Rise Enhancement (BPIP-PRIME, Version 04274) is used for the modeling. Buildings that influence stack downwash are included in the model. The BPIP model input and output files are included in the electronic submittal.

### 2.4 Meteorological Data

The air model uses 5 years (2006-2010) of pre-processed Stage III meteorological data. This data was processed and provided by the MPCA for use in this modeling analysis. The surface data is from the Minneapolis St. Paul International Airport and is processed with land use parameters appropriate for this Facility. The base elevation of surface data station is 834 feet. Upper air data is from the Twin Cities-Chanhassen station for this same period.

### 2.5 Receptors

Receptor elevations and hill scale heights are determined for receptors using AERMOD's terrain preprocessor program, AERMAP, Version 11103. The elevations are extracted from the USGS seamless database with 1 arc second resolution.

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<sup>1</sup> The EPA released a new version of AERMOD (11353) on December 19, 2011. The new version is not expected to change the results; therefore, version 11103 is used to avoid the time-consuming process of re-running all of the models.

The following receptor grid was used for the significant impact analysis:

- Inside Property Line: 50 meter spacing
- Property Line: 25 meter spacing
- Cartesian grid with 100 meter spacing from the Facility to a distance of 2 km
- Cartesian grid with 500 meter spacing from 2 km to 10 km.

Because the Facility is a group of buildings in a campus arrangement there are no barriers to the public; therefore there is no ambient air boundary.

Refined models use the same receptor grid as above; however only include receptors out to the significant impact radius.

## 2.6 Operating Scenario

Only one operating scenario is proposed for this Facility. The engine-generators in GP002 and GP004 are permitted at 300 hours per year each. EU27 was installed as an insignificant activity and does not have a permitted limit. These generators operate during maintenance and readiness testing as well as in the event of an interruption in electricity. They are required by the Hospital and Lab's certificate of occupancy and provide critical backup power to protect the health and welfare of the patients in the event of a power outage.

Because the engine-generators must demonstrate availability, they are operated periodically for readiness testing and maintenance purposes. The air modeling assumes an operating scenario as follows:

On the first day of each month, EU05 is operated for 1 hour at full load starting at 8 AM. At 9AM, EU05 shuts down and EU06 runs for 1 hour at full load. The testing subsequently occurs for EU07-EU10 and then for EU15-EU18, and finally EU27 operates from 6PM to 7PM. The generators are not operated for the remainder of the month. This is a realistic schedule for maintenance and readiness testing. Typically, the engines are not operated at full load during such a test, so the model is still over predicting by assuming 100% load. While such an operating schedule would not be valid if the generators must be used in an emergency situation, Allina proposes that this scenario be considered for the following reasons:

- It represents a typical scenario for maintenance and readiness testing
- It represents the worst case short term emission rate by modeling at 100% load. Typical readiness testing is conducted at less than 100% load.
- This demonstration is for a state statute and based on guidance. It is not required by a rule. Emergency generators are excluded from the Air Emissions Risk Analysis (AERA) process.

## 2.7 Modeled Background Sources

Emission sources in addition to the Hospital and Lab emission units are included in the air modeling. The MPCA provided background sources for use in this air modeling concentration analysis based on the MPCA's First Approximation Representative (FAR) method. Background sources are modeled as volume sources through the use of an "INCLUDE" keyword in the AERMOD input file. The FAR input files provided by the MPCA were unmodified, except for the Abbott Northwestern Hospital (source ID 1079) volume source which was removed because it is being explicitly modeled.

## 2.8 Monitored Background

The air modeling uses monitored background data recommended by the MPCA. The MPCA provided hourly monitored values for use in the air model. In addition, a seasonal background value is added whenever a particular hourly value is invalid or missing. These background values are added to modeled air concentrations of the source groups to determine the total concentration at a receptor. The MPCA offers several methods for calculating the monitored background values. The method used in the air model is the MPCA recommended choice denoted as "ALLSITESvia1overR". This method includes all background monitoring locations and weights the value using inverse-distance weighting.

## 2.9 Significant Impact Analysis

A significant impact analysis is presented for the following pollutants:

- Carbon Monoxide, CO (1-hr and 8-hr)
- Nitrogen Dioxide, NO<sub>2</sub> (1-hr, and annual)
- Particulate Matter less than 10 microns, PM10 (24-hr)
- Particulate Matter less than 2.5 microns, PM2.5 (24-hr and Annual)
- Sulfur Dioxide, SO<sub>2</sub> (1-hr, 3-hr, 24-hr, and annual)
- Lead (monthly)

The results of the significant impact analysis are presented in Section 3 and are used to determine the significant impact radius used for the NAAQS analysis.

## 2.10 NAAQS Analysis

A NAAQS analysis is presented for the following pollutants:

- Nitrogen Dioxide, NO<sub>2</sub> (1-hr, and Annual)
- Particulate Matter less than 2.5 microns, PM2.5 (24-hr and Annual)

See Section 3 for a discussion of the NAAQS models.

## **2.11 Flagpole Receptor Analysis**

The MPCA requested a flagpole receptor analysis be included with the air modeling, because the Facility is located in close proximity to tall buildings. The modeling runs were refined to use a receptor grid consisting of flagpole receptors on tall buildings at 10 ft intervals from the ground floor to the top floor.

### 3.0 DISCUSSION

This section discusses the significant factors from the significant impact and NAAQS air modeling impact analyses. A summary of the numerical results is presented in Table 4.0. The following is a list of source group ID's used in the models and the corresponding sources in each source groups:

- FAR – Includes only the modeled concentrations due to the FAR volume sources (modeled background). This does not include monitored background.
- GP001 – Concentration from Hospital main boilers (EU01-04). Does not include any background.
- GP002 – Concentration from generators in group 2 (EU05-10). Does not include any background.
- GP003 – Concentration from Heart Hospital boilers (EU11-14). Does not include any background.
- GP004 – Concentration from generators in group 4 (EU15-18). Does not include any background.
- GP005 – Concentration from Lab and parking garage boilers (EU19-26, EU28). Does not include any background.
- EU27 – Concentration from Lab generator (EU27). Does not include any background.
- ABBOTT – Includes all sources at the Facility. Does not include any background.
- BKG – Includes only the monitored background
- ALL – Includes all modeled sources and monitored background.

The “ABBOTT” source group is used to determine the significant impact radius. The “ALL” source group is used to determine total modeled concentrations for comparison to the NAAQS.

### 3.1 Significant Impact Analysis

Table 3.1 shows the Significant Impact Radius for each pollutant and averaging time:

TABLE 3.1 - SIGNIFICANT IMPACT RADIUS					
Pollutant	Averaging Time	Maximum Concentration ( $\mu\text{g}/\text{m}^3$ )	Significant Impact Radius (meters)	Significant Impact Level ( $\mu\text{g}/\text{m}^3$ )	NAAQS ( $\mu\text{g}/\text{m}^3$ )
NO <sub>2</sub>	Annual	9.5	700	1.0	100
NO <sub>2</sub>	1-hr	373.1	6000	7.55	188
PM10	Annual	0.9	N/A	1.0	none
PM10	24-hr	4.3	N/A	5.0	150
PM2.5	Annual	0.9	400	0.3	15
PM2.5	24-hr	3.3	400	1.2	35
CO	8-hr	76.3	N/A	500	10,000
CO	1-hr	241.5	N/A	2000	40,000
Lead	Monthly	0.0007	N/A	none	0.15
SO <sub>2</sub>	Annual	0.1	N/A	1.0	196
SO <sub>2</sub>	24-hr	0.3	N/A	5.0	1300
SO <sub>2</sub>	3-hr	0.7	N/A	25	365
SO <sub>2</sub>	1-hr	1.5	N/A	7.80	80

The appropriate receptor grid was chosen for each pollutant based on the results in the table above. Because the maximum concentration of PM10, CO, and SO<sub>2</sub> from the Facility are less than the corresponding Significant Impact Levels (SIL), the Facility does not significantly impact for these pollutants and they are not modeled for comparison to the NAAQS. Lead does not have a SIL established; however the maximum monthly modeled concentration is approximately 0.5% of the NAAQS, therefore further analysis is not presented. Using the monthly averaging period is more conservative than using the 3 month rolling average which is the form of the standard.

See Figures 3 through 6 for contour plots of the significant impact analysis results showing the significant impact radius.

### 3.2 NAAQS Analysis

The Facility can emit NO<sub>2</sub> and PM2.5 at rates where the concentrations exceed the SIL, therefore, a refined analysis is conducted for these pollutants and the results compared to the NAAQS.



### 3.2.1 NAAQS NO<sub>2</sub> Models

#### 3.2.1.1 NAAQS NO<sub>2</sub> (1-HR) Model

The significant impact radius for NO<sub>2</sub> is larger than the other pollutants due to the relatively low 1-hr NO<sub>2</sub> SIL. The receptor grid has been limited to only those receptors which show a concentration at or greater than the SIL<sup>2</sup> rather than the historic method of including all receptors within the significant impact radius.

The modeled 1-hr concentrations exceed the 1-hr NO<sub>2</sub> NAAQS at numerous receptors (See Figure 7); however, these concentrations are due primarily to the modeled background sources and not the Facility.

The new source review workshop manual<sup>3</sup> states that:

***“When a violation of any NAAQS or increment is predicted at one or more receptors in the impact area, the applicant can determine whether the net emissions increase from the proposed source will results in a significant ambient impact at the point (receptor) of each predicted violation, and at the time the violation is predicted to occur. The source will not be considered to cause or contribute to the violation if its own impact is not significant at any violating receptor at the time of the predicted violation. In such case, the permitting agency, upon verification of the demonstration, may approve the permit.”***

Figure 7 shows the total modeled concentrations. The primary contributor to the modeled concentration is the University of Minnesota (University).

The volume source representing the University (source ID #1126) is located approximately 3.4 km to the northeast of the Facility. In contrast, the only time the Facility could contribute to the ground level concentration near the University is when the wind is blowing from the southwest. If the wind is blowing from the southwest, the only receptors that can exceed the NAAQS are to the north and east of the University. Based on the concentrations shown in Figure 8, the Facility will cause a concentration over the SIL to the north or east of the University at any time; therefore the Facility does not cause or contribute to a modeled exceedance.

Two areas in Figure 7 exceed 160 µg/m<sup>3</sup> (but do not exceed 188 µg/m<sup>3</sup>). The area directly to the west of the Facility is influenced by Nico Products Inc. (source #1076). The larger area to the south and east of the Facility is influenced by the Minneapolis/St. Paul International Airport (source ID #1005).

The concentrations from the Facility are rather minimal compared to the background. As shown on Figure 7, most of the area experiences a concentration of between 140-160 µg/m<sup>3</sup>. The concentration due to background (even if the Facility did not exist) would still be 140-160 µg/m<sup>3</sup>. The maximum

<sup>2</sup> This method is encouraged by an EPA memorandum dated March 1, 2011.

<sup>3</sup> New Source Review Workshop Manual, Prevention of Significant Deterioration and Nonattainment Area Permitting, October 1990.

concentration near the Facility rises to approximately  $178 \mu\text{g}/\text{m}^3$ , which indicates that the Facility causes an increase of approximately  $18\text{-}38 \mu\text{g}/\text{m}^3$ . This is only 10-20% of the NAAQS.

These results demonstrate compliance with the 1-hr  $\text{NO}_2$  NAAQS.

#### 3.2.1.2 NAAQS $\text{NO}_2$ (annual) Model

The annual  $\text{NO}_2$  model demonstrates compliance with the NAAQS (see Section 4.0, and Figure 9).

### **3.2.2 NAAQS $\text{PM}_{2.5}$ Models**

#### 3.2.2.1 NAAQS $\text{PM}_{2.5}$ (24-hr) Model

The 24-hr  $\text{PM}_{2.5}$  model demonstrates compliance with the NAAQS (see Section 4.0). A contour plot is not provided because the concentration only varies by approximately  $1.5 \mu\text{g}/\text{m}^3$  across the entire SIR. Based on the difference between the maximum concentration from the Facility and the concentration including background, it is evident that most of the concentration is due to background and not from the Facility.

#### 3.2.2.2 NAAQS $\text{PM}_{2.5}$ (annual) Model

The annual  $\text{PM}_{2.5}$  model demonstrates compliance with the NAAQS (see Section 4.0). A contour plot is not provided because the concentration only varies by approximately  $0.8 \mu\text{g}/\text{m}^3$  across the entire SIR. Based on the difference between the maximum concentration from the Facility and the concentration including background, it is evident that most of the concentration is due to background and not from the Facility.

## 4.0 RESULTS

A summary of the results of the NAAQS dispersion modeling is below.

TABLE 4.0 - MODELED GROUND LEVEL RECEPTOR CONCENTRATIONS			
Pollutant	Averaging Time	Modeled Concentration Facility and Background ( $\mu\text{g}/\text{m}^3$ )	NAAQS ( $\mu\text{g}/\text{m}^3$ )
NO <sub>2</sub>	Annual	48.8	100
NO <sub>2</sub>	1-hr	178.7 (A)	188
PM2.5	Annual	13.0	15
PM2.5	24-hr	34.0	35
(A) Figure 2 shows a maximum impact of 442 $\mu\text{g}/\text{m}^3$ ; however the maximum impact near the Facility is 178.7 $\mu\text{g}/\text{m}^3$ along the east side of the Lab building. See discussion in Section 3.2.1.1.			
Annual impacts represent 5 year average impacts.			
1-hr NO <sub>2</sub> represents 5-yr average of the 98th percentile of the daily maximum 1-hr impacts			
24-hr PM2.5 represents the 5-yr average of the 98th percentile of daily impacts			

The distribution of ambient concentrations presented in the figures indicates that the concentrations from the Facility are minimal when compared to the concentrations from other sources and monitored background. The Facility shows a minimal increase in concentration over the background in areas beyond 700 meters from the Facility. Concentrations considered in this report due to this Facility meet the NAAQS and do not pose a risk to human health or welfare.

#### 4.1 Flagpole Receptor Analysis

A separate air modeling concentration analysis was completed for NO<sub>2</sub> and PM<sub>2.5</sub> using the flagpole receptors discussed in Section 2.11. Flagpole receptors represent elevated locations above ground level. This analysis is presented to determine concentrations at elevated receptors such as residential and public areas located on tall buildings. The highest concentrations from all modeled sources and background are presented in Table 4.1. Because no receptors exceed the NAAQS, the Facility complies with the NAAQS's.

TABLE 4.1 - MODELED FLAGPOLE RECEPTOR CONCENTRATIONS			
Pollutant	Averaging Time	Modeled Concentration + Background (µg/m <sup>3</sup> )	NAAQS (µg/m <sup>3</sup> )
NO <sub>2</sub>	Annual	39.1	100
NO <sub>2</sub>	1-hr	170.3	188
PM <sub>2.5</sub>	Annual	12.9	15
PM <sub>2.5</sub>	24-hr	34.2	35
Annual impacts represent 5 year average impacts.			
1-hr NO <sub>2</sub> represents 5-yr average of the 98th percentile of the daily maximum 1-hr impacts			
24-hr PM <sub>2.5</sub> represents the 5-yr average of the 98th percentile of daily impacts			

## 5.0 SUMMARY

The proposed project does not cause or contribute to an exceedance of the national ambient air quality standards. The required model files are included in digital format with this report. Please contact the undersigned at 651-697-9737 if you have questions regarding the analysis.

This report was prepared for the exclusive use of Abbott Northwestern Hospital. Any use which a third party makes of this report, or any reliance on or decisions to be made based on it, are the responsibility of such third parties. Golder accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report.

### GOLDER ASSOCIATES INC.



Ryan Birkenholz, P.E.  
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## TABLES

TABLE A1 : EMISSION SUMMARY (LIMITED POTENTIAL TO EMIT)								
Criteria Pollutants								
Pollutant	CAS	GP001 Main Campus Boilers (tpy)	GP002 Main Campus Generators (tpy)	GP003 Heart Hospital Boilers (tpy)	GP004 Heart Hospital Generators (tpy)	GP005 10th Ave Boilers (tpy)	EU27 Generator (tpy)	FACILITY LIMITED PTE (tpy)
PM		3.241	0.39	1.30	0.29	0.88	0.03	6
PM10		2.863	0.34	1.23	0.26	0.88	0.03	6
PM2.5		2.580	0.33	1.18	0.25	0.88	0.03	5
SO <sub>2</sub>		0.238	0.01	0.10	0.00	0.07	0.00	0
NO <sub>x</sub>		33.800	14.16	15.47	10.36	11.54	6.32	92
VOC		1.654	0.48	0.83	0.36	0.63	0.14	4
CO		23.938	3.68	12.61	2.68	9.69	0.52	53
Greenhouse Gas (CO <sub>2</sub> e)		40,096	702	18,505	510	13,882	474	74,168
CO <sub>2</sub>		40,036	699	18,483	508	13,868	473	74,067
CH <sub>4</sub>		9.39E-01	2.84E-02	3.82E-01	2.06E-02	2.62E-01	1.92E-02	2
N <sub>2</sub> O		1.28E-01	5.67E-03	4.45E-02	4.12E-03	2.62E-02	3.83E-03	0
Organics								
Acetaldehyde	75-07-0	0.00E+00	7.72E-07	0.00E+00	5.61E-07	0.00E+00	5.22E-07	1.85E-06
Acrolein	107-02-8	0.00E+00	2.41E-07	0.00E+00	1.75E-07	0.00E+00	1.63E-07	5.80E-07
Benzene	71-43-2	6.32E-04	3.33E-03	3.15E-04	2.42E-03	2.42E-04	2.25E-03	9.19E-03
Butane	106-97-8	5.51E-01	0.00E+00	3.15E-01	0.00E+00	2.42E-01	0.00E+00	1.11E+00
Dichlorobenzene	25321-22-6	3.15E-04	0.00E+00	1.80E-04	0.00E+00	1.38E-04	0.00E+00	6.34E-04
Ethylbenzene	100-41-4	2.40E-05	0.00E+00	4.36E-06	0.00E+00	0.00E+00	0.00E+00	2.84E-05
Ethane	74-84-0	8.14E-01	0.00E+00	4.66E-01	0.00E+00	3.58E-01	0.00E+00	1.64E+00
Formaldehyde	50-00-0	3.21E-02	3.38E-04	1.28E-02	2.46E-04	8.66E-03	2.29E-04	5.44E-02
Hexane	110-54-3	4.73E-01	0.00E+00	2.70E-01	0.00E+00	2.08E-01	0.00E+00	9.51E-01
Naphthalene	91-20-3	5.87E-04	5.57E-04	1.63E-04	4.05E-04	7.04E-05	3.77E-04	2.16E-03
Pentane	109-66-0	6.83E-01	0.00E+00	3.90E-01	0.00E+00	3.00E-01	0.00E+00	1.37E+00
Propane	74-98-6	4.20E-01	0.00E+00	2.40E-01	0.00E+00	1.85E-01	0.00E+00	8.45E-01
Propylene	115-07-1	0.00E+00	1.20E-02	0.00E+00	8.70E-03	0.00E+00	8.09E-03	2.87E-02
1,1,1-Trichloroethane	71-55-6	8.91E-05	0.00E+00	1.62E-05	0.00E+00	0.00E+00	0.00E+00	1.05E-04
Toluene	108-88-3	3.23E-03	1.20E-03	9.04E-04	8.76E-04	3.92E-04	8.14E-04	7.42E-03
Xylene (o,m,p)	1332-20-7	4.11E-05	8.28E-04	7.47E-06	6.02E-04	0.00E+00	5.59E-04	2.04E-03
Acenaphthene	83-32-9	8.44E-06	2.01E-05	1.70E-06	1.46E-05	2.08E-07	1.36E-05	5.86E-05
Acenaphthylene	203-96-8	5.68E-07	3.96E-05	2.71E-07	2.88E-05	2.08E-07	2.67E-05	9.62E-05
Anthracene	120-12-7	1.09E-06	5.27E-06	4.22E-07	3.84E-06	2.77E-07	3.56E-06	1.45E-05
Benz(a)anthracene	56-55-3	1.99E-06	2.67E-06	5.28E-07	1.94E-06	2.08E-07	1.80E-06	9.13E-06
Benzo(a)pyrene	50-32-8	3.15E-07	1.10E-06	1.80E-07	8.01E-07	1.38E-07	7.45E-07	3.28E-06
Benzo(b)fluoranthene	205-99-2	4.73E-07	4.76E-06	2.70E-07	3.46E-06	2.08E-07	3.22E-06	1.24E-05
Benzo(b,k)fluoranthene	205-99-2	5.59E-07	0.00E+00	1.01E-07	0.00E+00	0.00E+00	0.00E+00	6.60E-07
Benzo(g,h,i)perylene	191-24-2	1.17E-06	2.38E-06	3.24E-07	1.73E-06	1.38E-07	1.61E-06	7.36E-06
Benzo(k)fluoranthene	205-82-3	4.73E-07	9.35E-07	2.70E-07	6.80E-07	2.08E-07	6.32E-07	3.20E-06
Chrysene	218-01-9	1.37E-06	6.56E-06	4.17E-07	4.77E-06	2.08E-07	4.43E-06	1.78E-05
Dibenzo(a,h)anthracene	53-70-3	9.45E-07	1.48E-06	2.84E-07	1.08E-06	1.38E-07	1.00E-06	4.93E-06
7,12-Dimethylbenz(a)anthracene	57-97-6	4.20E-06	0.00E+00	2.40E-06	0.00E+00	1.85E-06	0.00E+00	8.45E-06
Fluoranthene	206-44-0	2.61E-06	1.73E-05	7.55E-07	1.26E-05	3.46E-07	1.17E-05	4.52E-05
Fluorene	86-73-7	2.42E-06	5.49E-05	7.01E-07	3.99E-05	3.23E-07	3.71E-05	1.35E-04
Indeno(1,2,3-cd)pyrene	193-39-5	1.28E-06	1.78E-06	4.00E-07	1.29E-06	2.08E-07	1.20E-06	6.15E-06
2-Methylnaphthalene	91-57-6	6.30E-06	0.00E+00	3.60E-06	0.00E+00	2.77E-06	0.00E+00	1.27E-05
3-Methylchloranthrene	56-49-5	4.73E-07	0.00E+00	2.70E-07	0.00E+00	2.08E-07	0.00E+00	9.51E-07
Phenanthrene	85-01-8	8.43E-06	1.75E-04	3.12E-06	1.27E-04	1.96E-06	1.18E-04	4.34E-04
Pyrene	129-00-0	1.47E-05	1.59E-05	7.51E-06	1.16E-05	5.77E-06	1.08E-05	6.62E-05
OCDD	3268-87-9	1.17E-09	0.00E+00	2.12E-10	0.00E+00	0.00E+00	0.00E+00	1.38E-09
Polycyclic Organic Matter (POM)		5.78E-05	3.50E-04	2.29E-05	2.54E-04	1.54E-05	2.36E-04	9.36E-04
Metals								
Antimony	7440-36-0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Arsenic	7440-38-2	2.64E-04	0.00E+00	6.66E-05	0.00E+00	2.31E-05	0.00E+00	3.54E-04
Barium	7440-39-3	1.16E-03	0.00E+00	6.61E-04	0.00E+00	5.08E-04	0.00E+00	2.32E-03
Beryllium	7440-41-7	1.62E-04	0.00E+00	3.05E-05	0.00E+00	1.38E-06	0.00E+00	1.94E-04
Cadmium	7440-43-9	4.47E-04	0.00E+00	1.84E-04	0.00E+00	1.27E-04	0.00E+00	7.58E-04
Chloride		0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Chromium	7440-47-3	5.26E-04	0.00E+00	2.26E-04	0.00E+00	1.62E-04	0.00E+00	9.14E-04
Chromium (VI)	18540-29-9	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Cobalt	7440-48-4	2.21E-05	0.00E+00	1.26E-05	0.00E+00	9.69E-06	0.00E+00	4.44E-05
Copper	7440-50-8	5.40E-04	0.00E+00	1.77E-04	0.00E+00	9.81E-05	0.00E+00	8.16E-04
Fluoride	16984-48-8	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Lead	7139-92-1	6.07E-04	0.00E+00	1.57E-04	0.00E+00	5.77E-05	0.00E+00	8.21E-04
Manganese	7439-96-5	4.17E-04	0.00E+00	1.11E-04	0.00E+00	4.39E-05	0.00E+00	5.72E-04
Mercury	7439-97-6	2.27E-04	0.00E+00	6.54E-05	0.00E+00	3.00E-05	0.00E+00	3.22E-04
Molybdenum	7439-98-7	2.89E-04	0.00E+00	1.65E-04	0.00E+00	1.27E-04	0.00E+00	5.81E-04
Nickel	7440-02-0	7.10E-04	0.00E+00	3.25E-04	0.00E+00	2.42E-04	0.00E+00	1.28E-03
Phosphorus	7723-14-0	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Selenium	7782-49-2	7.99E-04	0.00E+00	1.47E-04	0.00E+00	2.77E-06	0.00E+00	9.49E-04
Vanadium	7440-62-2	6.04E-04	0.00E+00	3.45E-04	0.00E+00	2.65E-04	0.00E+00	1.21E-03
Zinc	7440-66-6	7.82E-03	0.00E+00	4.35E-03	0.00E+00	3.35E-03	0.00E+00	1.55E-02
Max HAP		4.73E-01	5.97E-04	2.70E-01	7.25E-04	2.08E-01	2.25E-03	9.54E-01
Total HAP		5.14E-01	1.18E-03	2.84E-01	1.44E-03	2.18E-01	4.46E-03	1.02E+00

See Tables 2 through 31 for detailed calculations for each emission unit or group.

TABLE A2 : EU01 EMISSION CALCULATIONS (NATURAL GAS)							
Parameter	Value	Units	Source				
Emission Unit	EU001		MPCA Emission Unit ID				
Make	Bros		State operating permit application, November 1995				
Model	W2-37		State operating permit application, November 1995				
Maximum Heat Input	29	MMBtu/hr	State operating permit application, November 1995				
Fuel	Natural Gas						
Maximum Fuel Input	0.0284	MMSCF/hr	(Maximum Heat Input)/(Fuel Heat Value)				
Unlimited Annual Operation	8760	hr/yr	Number of hours in a year				
Unlimited Annual Fuel Input	249	MMSCF/yr	(Maximum Fuel Input) * (Unlimited Annual Operation)				
Annual Limit	525	MMSCF/yr	Permit limit for EU01-04				
Fuel Heat Value	1020	btu/scf	AP-42 Section 1.4				
Criteria Pollutants							
Pollutant	CAS	Emission Factor		Unlimited Emission Rate (lb/hr)	Unlimited Emission Rate (tpy)	Limited Emission Rate (tpy)	NOTES
PM		7.60	lb/MMSCF	0.216	0.95	0.95	A
PM10		7.60	lb/MMSCF	0.216	0.95	0.95	A
PM2.5		7.60	lb/MMSCF	0.216	0.95	0.95	A
SO <sub>2</sub>		0.60	lb/MMSCF	0.017	0.07	0.07	A
NOx		100.00	lb/MMSCF	2.843	12.45	12.45	B
VOC		5.50	lb/MMSCF	0.156	0.68	0.68	A
CO		84.00	lb/MMSCF	2.388	10.46	10.46	B
Greenhouse Gas (CO <sub>2</sub> e)				3,420	14,978	14,978	G
CO <sub>2</sub>		120161	lb/MMSCF	3,416	14,964	14,964	E
CH <sub>4</sub>		2.27E+00	lb/MMSCF	6.44E-02	2.82E-01	2.82E-01	F
N <sub>2</sub> O		2.27E-01	lb/MMSCF	6.44E-03	2.82E-02	2.82E-02	F
Organics							
Benzene	71-43-2	2.10E-03	lb/MMSCF	5.97E-05	2.62E-04	2.62E-04	C
Butane	106-97-8	2.10E+00	lb/MMSCF	5.97E-02	2.62E-01	2.62E-01	C
Dichlorobenzene	25321-22-6	1.20E-03	lb/MMSCF	3.41E-05	1.49E-04	1.49E-04	C
Ethane	74-84-0	3.10E+00	lb/MMSCF	8.81E-02	3.86E-01	3.86E-01	C
Formaldehyde	50-00-0	7.50E-02	lb/MMSCF	2.13E-03	9.34E-03	9.34E-03	C
Hexane	110-54-3	1.80E+00	lb/MMSCF	5.12E-02	2.24E-01	2.24E-01	C
Naphthalene	91-20-3	6.10E-04	lb/MMSCF	1.73E-05	7.60E-05	7.60E-05	C
Pentane	109-66-0	2.60E+00	lb/MMSCF	7.39E-02	3.24E-01	3.24E-01	C
Propane	74-98-6	1.60E+00	lb/MMSCF	4.55E-02	1.99E-01	1.99E-01	C
Toluene	108-88-3	3.40E-03	lb/MMSCF	9.67E-05	4.23E-04	4.23E-04	C
Acenaphthene	83-32-9	1.80E-06	lb/MMSCF	5.12E-08	2.24E-07	2.24E-07	C
Acenaphthylene	203-96-8	1.80E-06	lb/MMSCF	5.12E-08	2.24E-07	2.24E-07	C
Anthracene	120-12-7	2.40E-06	lb/MMSCF	6.82E-08	2.99E-07	2.99E-07	C
Benzo(a)anthracene	56-55-3	1.80E-06	lb/MMSCF	5.12E-08	2.24E-07	2.24E-07	C
Benzo(a)pyrene	50-32-8	1.20E-06	lb/MMSCF	3.41E-08	1.49E-07	1.49E-07	C
Benzo(b)fluoranthene	205-99-2	1.80E-06	lb/MMSCF	5.12E-08	2.24E-07	2.24E-07	C
Benzo(g,h,i)perylene	191-24-2	1.20E-06	lb/MMSCF	3.41E-08	1.49E-07	1.49E-07	C
Benzo(k)fluoranthene	205-82-3	1.80E-06	lb/MMSCF	5.12E-08	2.24E-07	2.24E-07	C
Chrysene	218-01-9	1.80E-06	lb/MMSCF	5.12E-08	2.24E-07	2.24E-07	C
Dibenzo(a,h)anthracene	53-70-3	1.20E-06	lb/MMSCF	3.41E-08	1.49E-07	1.49E-07	C
7,12-Dimethylbenz(a)anthracene	57-97-6	1.60E-05	lb/MMSCF	4.55E-07	1.99E-06	1.99E-06	C
Fluoranthene	206-44-0	3.00E-06	lb/MMSCF	8.53E-08	3.74E-07	3.74E-07	C
Fluorene	86-73-7	2.80E-06	lb/MMSCF	7.96E-08	3.49E-07	3.49E-07	C
Indeno(1,2,3-cd)pyrene	193-39-5	1.80E-06	lb/MMSCF	5.12E-08	2.24E-07	2.24E-07	C
2-Methylnaphthalene	91-57-6	2.40E-05	lb/MMSCF	6.82E-07	2.99E-06	2.99E-06	C
3-Methylchloranthrene	56-49-5	1.80E-06	lb/MMSCF	5.12E-08	2.24E-07	2.24E-07	C
Phenanthrene	85-01-8	1.70E-05	lb/MMSCF	4.83E-07	2.12E-06	2.12E-06	C
Pyrene	129-00-0	5.00E-05	lb/MMSCF	1.42E-06	6.23E-06	6.23E-06	C
Polycyclic Organic Matter (POM)		1.33E-04	lb/MMSCF	3.79E-06	1.66E-05	1.66E-05	
Metals							
Arsenic	7440-38-2	2.00E-04	lb/MMSCF	5.69E-06	2.49E-05	2.49E-05	D
Barium	7440-39-3	4.40E-03	lb/MMSCF	1.25E-04	5.48E-04	5.48E-04	D
Beryllium	7440-41-7	1.20E-05	lb/MMSCF	3.41E-07	1.49E-06	1.49E-06	D
Cadmium	7440-43-9	1.10E-03	lb/MMSCF	3.13E-05	1.37E-04	1.37E-04	D
Chromium	7440-47-3	1.40E-03	lb/MMSCF	3.98E-05	1.74E-04	1.74E-04	D
Cobalt	7440-48-4	8.40E-05	lb/MMSCF	2.39E-06	1.05E-05	1.05E-05	D
Copper	7440-50-8	8.50E-04	lb/MMSCF	2.42E-05	1.06E-04	1.06E-04	D
Lead	7139-92-1	5.00E-04	lb/MMSCF	1.42E-05	6.23E-05	6.23E-05	D
Manganese	7439-96-5	3.80E-04	lb/MMSCF	1.08E-05	4.73E-05	4.73E-05	D
Mercury	7439-97-6	2.60E-04	lb/MMSCF	7.39E-06	3.24E-05	3.24E-05	D
Molybdenum	7439-98-7	1.10E-03	lb/MMSCF	3.13E-05	1.37E-04	1.37E-04	D
Nickel	7440-02-0	2.10E-03	lb/MMSCF	5.97E-05	2.62E-04	2.62E-04	D
Selenium	7782-49-2	2.40E-05	lb/MMSCF	6.82E-07	2.99E-06	2.99E-06	D
Vanadium	7440-62-2	2.30E-03	lb/MMSCF	6.54E-05	2.86E-04	2.86E-04	D
Zinc	7440-66-6	2.90E-02	lb/MMSCF	8.25E-04	3.61E-03	3.61E-03	D
Max HAP					2.24E-01	2.24E-01	
Total HAP					2.35E-01	2.35E-01	

## NOTES

- A AP-42 Table 1.4-2  
 B AP-42 Table 1.4-1  
 C AP-42 Table 1.4-3  
 D AP-42 Table 1.4-4  
 E 40 CFR Part 98 Table C-1: Pipeline natural gas = 1028 btu/scf, CO<sub>2</sub> emission = 53.02 kg CO<sub>2</sub>/mmBtu = 120162 lb/MMscf  
 F 40 CFR Part 98 Table C-2: Pipeline natural gas = 1028 btu/scf, CH<sub>4</sub> = 0.001 kg CH<sub>4</sub>/mmBtu, N<sub>2</sub>O = 0.0001 kg N<sub>2</sub>O / mmBtu  
 G CO<sub>2</sub>e = (Global Warming Potential, GWP) \* (Emission). GWP from 40 CFR Part 98 Table A-1. CO<sub>2</sub> = 1, CH<sub>4</sub> = 21, N<sub>2</sub>O = 310



TABLE A3 : EU01 EMISSION CALCULATIONS (FUEL OIL)							
Parameter	Value	Units		Source			
Emission Unit	EU001			MPCA Emission Unit ID			
Make	Bros			State operating permit application, November 1995			
Model	W2-37			State operating permit application, November 1995			
Maximum Heat Input	29	MMBtu/hr		State operating permit application, November 1995			
Fuel	No 2 Fuel Oil						
Maximum Fuel Input	207.1	gal/hr		(Maximum Heat Input)/(Fuel Heat Value)			
Unlimited Annual Operation	8760	hr/yr		Number of hours in a year			
Unlimited Annual Fuel Input	1,814,571	gal/yr		(Maximum Fuel Input) * (Unlimited Annual Operation)			
Annual Limit	755,000	gal/yr		Permit limit for EU01-04			
Fuel Heat Value	0.14	MMBtu/gal		AP-42 Section 1.4			
Criteria Pollutants							
Pollutant	CAS	Emission Factor		Unlimited Emission Rate (lb/hr)	Unlimited Emission Rate (tpy)	Limited Emission Rate (tpy)	NOTES
PM		3.30	lb/1000 gal	0.684	2.99	1.25	A
PM10		2.30	lb/1000 gal	0.476	2.09	0.87	B
PM2.5		1.55	lb/1000 gal	0.321	1.41	0.59	B
SO2		0.21	lb/1000 gal	0.044	0.19	0.08	A, C
NOx		20.00	lb/1000 gal	4.143	18.15	7.55	A
VOC		0.56	lb/1000 gal	0.115	0.50	0.21	A
CO		5.00	lb/1000 gal	1.036	4.54	1.89	A
Greenhouse Gas (CO <sub>2</sub> e)				4,677	20,484	8,523	J
CO <sub>2</sub>		22501	lb/1000 gal	4,661	20,415	8,494	H
CH <sub>4</sub>		9.13E-01	lb/1000 gal	0.19	8.28E-01	3.45E-01	I
N <sub>2</sub> O		1.83E-01	lb/1000 gal	0.04	1.66E-01	6.89E-02	I
Organics							
Benzene	71-43-2	2.14E-04	lb/1000 gal	4.43E-05	1.94E-04	8.08E-05	D
Ethylbenzene	100-41-4	6.36E-05	lb/1000 gal	1.32E-05	5.77E-05	2.40E-05	D
Formaldehyde	50-00-0	3.30E-02	lb/1000 gal	6.84E-03	2.99E-02	1.25E-02	D
Naphthalene	91-20-3	1.13E-03	lb/1000 gal	2.34E-04	1.03E-03	4.27E-04	D
1,1,1-Trichloroethane	71-55-6	2.36E-04	lb/1000 gal	4.89E-05	2.14E-04	8.91E-05	D
Toluene	108-88-3	6.20E-03	lb/1000 gal	1.28E-03	5.63E-03	2.34E-03	D
Xylene (o,m,p)	1332-20-7	1.09E-04	lb/1000 gal	2.26E-05	9.89E-05	4.11E-05	D
Acenaphthene	83-32-9	2.11E-05	lb/1000 gal	4.37E-06	1.91E-05	7.97E-06	D, F
Acenaphthylene	203-96-8	2.53E-07	lb/1000 gal	5.24E-08	2.30E-07	9.55E-08	D, F
Anthracene	120-12-7	1.22E-06	lb/1000 gal	2.53E-07	1.11E-06	4.61E-07	D, F
Benz(a)anthracene	56-55-3	4.01E-06	lb/1000 gal	8.31E-07	3.64E-06	1.51E-06	D, F
Benzo(b,k)fluoranthene	205-99-2	1.48E-06	lb/1000 gal	3.07E-07	1.34E-06	5.59E-07	D, F
Benzo(g,h,i)perylene	191-24-2	2.26E-06	lb/1000 gal	4.68E-07	2.05E-06	8.53E-07	D, F
Chrysene	218-01-9	2.38E-06	lb/1000 gal	4.93E-07	2.16E-06	8.98E-07	D, F
Dibenzo(a,h)anthracene	53-70-3	1.67E-06	lb/1000 gal	3.46E-07	1.52E-06	6.30E-07	D, F
Fluoranthene	206-44-0	4.84E-06	lb/1000 gal	1.00E-06	4.39E-06	1.83E-06	D, F
Fluorene	86-73-7	4.47E-06	lb/1000 gal	9.26E-07	4.06E-06	1.69E-06	D, F
Indeno(1,2,3-cd)pyrene	193-39-5	2.14E-06	lb/1000 gal	4.43E-07	1.94E-06	8.08E-07	D, F
Phenanthrene	85-01-8	1.05E-05	lb/1000 gal	2.18E-06	9.53E-06	3.96E-06	D, F
Pyrene	129-00-0	4.25E-06	lb/1000 gal	8.80E-07	3.86E-06	1.60E-06	D, F
OCDD	3268-87-9	3.10E-09	lb/1000 gal	6.42E-10	2.81E-09	1.17E-09	D, F
Polycyclic Organic Matter (POM)		6.06E-05	lb/1000 gal	1.25E-05	5.50E-05	2.29E-05	
Metals							
Arsenic	7440-38-2	5.60E-04	lb/1000 gal	1.16E-04	5.08E-04	2.11E-04	E
Beryllium	7440-41-7	4.20E-04	lb/1000 gal	8.70E-05	3.81E-04	1.59E-04	E
Cadmium	7440-43-9	4.20E-04	lb/1000 gal	8.70E-05	3.81E-04	1.59E-04	E
Chromium	7440-47-3	4.20E-04	lb/1000 gal	8.70E-05	3.81E-04	1.59E-04	E
Copper	7440-50-8	8.40E-04	lb/1000 gal	1.74E-04	7.62E-04	3.17E-04	E
Lead	7139-92-1	1.26E-03	lb/1000 gal	2.61E-04	1.14E-03	4.76E-04	E
Manganese	7439-96-5	8.40E-04	lb/1000 gal	1.74E-04	7.62E-04	3.17E-04	E
Mercury	7439-97-6	4.20E-04	lb/1000 gal	8.70E-05	3.81E-04	1.59E-04	E
Nickel	7440-02-0	4.20E-04	lb/1000 gal	8.70E-05	3.81E-04	1.59E-04	E
Selenium	7782-49-2	2.10E-03	lb/1000 gal	4.35E-04	1.91E-03	7.93E-04	E
Zinc	7440-66-6	5.60E-04	lb/1000 gal	1.16E-04	5.08E-04	2.11E-04	E
Max HAP					2.99E-02	1.25E-02	
Total HAP					4.34E-02	1.81E-02	

## NOTES

A

AP-42 Table 1.3-1, 9/98

B

AP-42 Table 1.3-6, 9/98

C

Sulfur Content= 0.0015 % wt

D

AP-42 Table 1.3-9, 9/98

E

AP-42 Table 1.3-10, 9/98

F

This compound is considered polycyclic organic matter (POM)

G

AP-42 Table 1.3-12, 9/98

H

40 CFR Part 98 Table C-1: Pipeline natural gas = 0.138 btu/gal, CO<sub>2</sub> emission = 73.96 kg CO<sub>2</sub>/mmBtu = 22,501 lb/1000 gal

I

40 CFR Part 98 Table C-2: Pipeline natural gas = 0.138 btu/gal, CH<sub>4</sub> = 0.003 kg CH<sub>4</sub>/mmBtu, N<sub>2</sub>O = 0.0006 kg N<sub>2</sub>O / mmBtu

J

CO<sub>2</sub>e = (Global Warming Potential, GWP) \* (Emission). GWP from 40 CFR Part 98 Table A-1. CO<sub>2</sub> = 1, CH<sub>4</sub> = 21, N<sub>2</sub>O = 310

TABLE A4 : EU02 EMISSION CALCULATIONS (NATURAL GAS)							
Parameter	Value	Units	Source				
Emission Unit	EU002		MPCA Emission Unit ID				
Make	Bros		State operating permit application, November 1995				
Model	W2-37		State operating permit application, November 1995				
Maximum Heat Input	29	MMBtu/hr	State operating permit application, November 1995				
Fuel	Natural Gas						
Maximum Fuel Input	0.0284	MMSCF/hr	(Maximum Heat Input)/(Fuel Heat Value)				
Unlimited Annual Operation	8760	hr/yr	Number of hours in a year				
Unlimited Annual Fuel Input	249	MMSCF/yr	(Maximum Fuel Input) * (Unlimited Annual Operation)				
Annual Limit	525	MMSCF/yr	Permit limit for EU01-04				
Fuel Heat Value	1020	btu/scf	AP-42 Section 1.4				
Criteria Pollutants							
Pollutant	CAS	Emission Factor		Unlimited Emission Rate (lb/hr)	Unlimited Emission Rate (tpy)	Limited Emission Rate (tpy)	NOTES
PM		7.60	lb/MMSCF	0.216	0.95	0.95	A
PM10		7.60	lb/MMSCF	0.216	0.95	0.95	A
PM2.5		7.60	lb/MMSCF	0.216	0.95	0.95	A
SO <sub>2</sub>		0.60	lb/MMSCF	0.017	0.07	0.07	A
NOx		100.00	lb/MMSCF	2.843	12.45	12.45	B
VOC		5.50	lb/MMSCF	0.156	0.68	0.68	A
CO		84.00	lb/MMSCF	2.388	10.46	10.46	B
Greenhouse Gas (CO <sub>2</sub> e)				3,420	14,978	14,978	G
CO <sub>2</sub>		120161	lb/MMSCF	3,416	14,964	14,964	E
CH <sub>4</sub>		2.27E+00	lb/MMSCF	6.44E-02	2.82E-01	2.82E-01	F
N <sub>2</sub> O		2.27E-01	lb/MMSCF	6.44E-03	2.82E-02	2.82E-02	F
Organics							
Benzene	71-43-2	2.10E-03	lb/MMSCF	5.97E-05	2.62E-04	2.62E-04	C
Butane	106-97-8	2.10E+00	lb/MMSCF	5.97E-02	2.62E-01	2.62E-01	C
Dichlorobenzene	25321-22-6	1.20E-03	lb/MMSCF	3.41E-05	1.49E-04	1.49E-04	C
Ethane	74-84-0	3.10E+00	lb/MMSCF	8.81E-02	3.86E-01	3.86E-01	C
Formaldehyde	50-00-0	7.50E-02	lb/MMSCF	2.13E-03	9.34E-03	9.34E-03	C
Hexane	110-54-3	1.80E+00	lb/MMSCF	5.12E-02	2.24E-01	2.24E-01	C
Naphthalene	91-20-3	6.10E-04	lb/MMSCF	1.73E-05	7.60E-05	7.60E-05	C
Pentane	109-66-0	2.60E+00	lb/MMSCF	7.39E-02	3.24E-01	3.24E-01	C
Propane	74-98-6	1.60E+00	lb/MMSCF	4.55E-02	1.99E-01	1.99E-01	C
Toluene	108-88-3	3.40E-03	lb/MMSCF	9.67E-05	4.23E-04	4.23E-04	C
Acenaphthene	83-32-9	1.80E-06	lb/MMSCF	5.12E-08	2.24E-07	2.24E-07	C
Acenaphthylene	203-96-8	1.80E-06	lb/MMSCF	5.12E-08	2.24E-07	2.24E-07	C
Anthracene	120-12-7	2.40E-06	lb/MMSCF	6.82E-08	2.99E-07	2.99E-07	C
Benzo(a)anthracene	56-55-3	1.80E-06	lb/MMSCF	5.12E-08	2.24E-07	2.24E-07	C
Benzo(a)pyrene	50-32-8	1.20E-06	lb/MMSCF	3.41E-08	1.49E-07	1.49E-07	C
Benzo(b)fluoranthene	205-99-2	1.80E-06	lb/MMSCF	5.12E-08	2.24E-07	2.24E-07	C
Benzo(g,h,i)perylene	191-24-2	1.20E-06	lb/MMSCF	3.41E-08	1.49E-07	1.49E-07	C
Benzo(k)fluoranthene	205-82-3	1.80E-06	lb/MMSCF	5.12E-08	2.24E-07	2.24E-07	C
Chrysene	218-01-9	1.80E-06	lb/MMSCF	5.12E-08	2.24E-07	2.24E-07	C
Dibenzo(a,h)anthracene	53-70-3	1.20E-06	lb/MMSCF	3.41E-08	1.49E-07	1.49E-07	C
7,12-Dimethylbenz(a)anthracene	57-97-6	1.60E-05	lb/MMSCF	4.55E-07	1.99E-06	1.99E-06	C
Fluoranthene	206-44-0	3.00E-06	lb/MMSCF	8.53E-08	3.74E-07	3.74E-07	C
Fluorene	86-73-7	2.80E-06	lb/MMSCF	7.96E-08	3.49E-07	3.49E-07	C
Indeno(1,2,3-cd)pyrene	193-39-5	1.80E-06	lb/MMSCF	5.12E-08	2.24E-07	2.24E-07	C
2-Methylnaphthalene	91-57-6	2.40E-05	lb/MMSCF	6.82E-07	2.99E-06	2.99E-06	C
3-Methylchloranthrene	56-49-5	1.80E-06	lb/MMSCF	5.12E-08	2.24E-07	2.24E-07	C
Phenanthrene	85-01-8	1.70E-05	lb/MMSCF	4.83E-07	2.12E-06	2.12E-06	C
Pyrene	129-00-0	5.00E-05	lb/MMSCF	1.42E-06	6.23E-06	6.23E-06	C
Polycyclic Organic Matter (POM)		1.33E-04	lb/MMSCF	3.79E-06	1.66E-05	1.66E-05	
Metals							
Arsenic	7440-38-2	2.00E-04	lb/MMSCF	5.69E-06	2.49E-05	2.49E-05	D
Barium	7440-39-3	4.40E-03	lb/MMSCF	1.25E-04	5.48E-04	5.48E-04	D
Beryllium	7440-41-7	1.20E-05	lb/MMSCF	3.41E-07	1.49E-06	1.49E-06	D
Cadmium	7440-43-9	1.10E-03	lb/MMSCF	3.13E-05	1.37E-04	1.37E-04	D
Chromium	7440-47-3	1.40E-03	lb/MMSCF	3.98E-05	1.74E-04	1.74E-04	D
Cobalt	7440-48-4	8.40E-05	lb/MMSCF	2.39E-06	1.05E-05	1.05E-05	D
Copper	7440-50-8	8.50E-04	lb/MMSCF	2.42E-05	1.06E-04	1.06E-04	D
Lead	7139-92-1	5.00E-04	lb/MMSCF	1.42E-05	6.23E-05	6.23E-05	D
Manganese	7439-96-5	3.80E-04	lb/MMSCF	1.08E-05	4.73E-05	4.73E-05	D
Mercury	7439-97-6	2.60E-04	lb/MMSCF	7.39E-06	3.24E-05	3.24E-05	D
Molybdenum	7439-98-7	1.10E-03	lb/MMSCF	3.13E-05	1.37E-04	1.37E-04	D
Nickel	7440-02-0	2.10E-03	lb/MMSCF	5.97E-05	2.62E-04	2.62E-04	D
Selenium	7782-49-2	2.40E-05	lb/MMSCF	6.82E-07	2.99E-06	2.99E-06	D
Vanadium	7440-62-2	2.30E-03	lb/MMSCF	6.54E-05	2.86E-04	2.86E-04	D
Zinc	7440-66-6	2.90E-02	lb/MMSCF	8.25E-04	3.61E-03	3.61E-03	D
Max HAP					2.24E-01	2.24E-01	
Total HAP					2.35E-01	2.35E-01	

## NOTES

- A AP-42 Table 1.4-2  
 B AP-42 Table 1.4-1  
 C AP-42 Table 1.4-3  
 D AP-42 Table 1.4-4  
 E 40 CFR Part 98 Table C-1: Pipeline natural gas = 1028 btu/scf, CO<sub>2</sub> emission = 53.02 kg CO<sub>2</sub>/mmBtu = 120162 lb/MMscf  
 F 40 CFR Part 98 Table C-2: Pipeline natural gas = 1028 btu/scf, CH<sub>4</sub> = 0.001 kg CH<sub>4</sub>/mmBtu, N<sub>2</sub>O = 0.0001 kg N<sub>2</sub>O / mmBtu  
 G CO<sub>2</sub>e = (Global Warming Potential, GWP) \* (Emission). GWP from 40 CFR Part 98 Table A-1. CO<sub>2</sub> = 1, CH<sub>4</sub> = 21, N<sub>2</sub>O = 310

TABLE A5: EU02 EMISSION CALCULATIONS (FUEL OIL)							
Parameter	Value	Units		Source			
Emission Unit	EU002			MPCA Emission Unit ID			
Make	Bros			State operating permit application, November 1995			
Model	W2-37			State operating permit application, November 1995			
Maximum Heat Input	29	MMBtu/hr		State operating permit application, November 1995			
Fuel	No 2 Fuel Oil						
Maximum Fuel Input	207.1	gal/hr		(Maximum Heat Input)/(Fuel Heat Value)			
Unlimited Annual Operation	8760	hr/yr		Number of hours in a year			
Unlimited Annual Fuel Input	1,814,571	gal/yr		(Maximum Fuel Input) * (Unlimited Annual Operation)			
Annual Limit	755,000	gal/yr		Permit limit for EU01-04			
Fuel Heat Value	0.14	MMBtu/gal		AP-42 Section 1.4			
Criteria Pollutants							
Pollutant	CAS	Emission Factor		Unlimited Emission Rate (lb/hr)	Unlimited Emission Rate (tpy)	Limited Emission Rate (tpy)	NOTES
PM		3.30	lb/1000 gal	0.684	2.99	1.25	A
PM10		2.30	lb/1000 gal	0.476	2.09	0.87	B
PM2.5		1.55	lb/1000 gal	0.321	1.41	0.59	B
SO2		0.21	lb/1000 gal	0.044	0.19	0.08	A, C
NOx		20.00	lb/1000 gal	4.143	18.15	7.55	A
VOC		0.56	lb/1000 gal	0.115	0.50	0.21	A
CO		5.00	lb/1000 gal	1.036	4.54	1.89	A
Greenhouse Gas (CO <sub>2</sub> e)				4,677	20,484	8,523	J
CO <sub>2</sub>		22501	lb/1000 gal	4,661	20,415	8,494	H
CH <sub>4</sub>		9.13E-01	lb/1000 gal	0.19	8.28E-01	3.45E-01	I
N <sub>2</sub> O		1.83E-01	lb/1000 gal	0.04	1.66E-01	6.89E-02	I
Organics							
Benzene	71-43-2	2.14E-04	lb/1000 gal	4.43E-05	1.94E-04	8.08E-05	D
Ethylbenzene	100-41-4	6.36E-05	lb/1000 gal	1.32E-05	5.77E-05	2.40E-05	D
Formaldehyde	50-00-0	3.30E-02	lb/1000 gal	6.84E-03	2.99E-02	1.25E-02	D
Naphthalene	91-20-3	1.13E-03	lb/1000 gal	2.34E-04	1.03E-03	4.27E-04	D
1,1,1-Trichloroethane	71-55-6	2.36E-04	lb/1000 gal	4.89E-05	2.14E-04	8.91E-05	D
Toluene	108-88-3	6.20E-03	lb/1000 gal	1.28E-03	5.63E-03	2.34E-03	D
Xylene (o,m,p)	1332-20-7	1.09E-04	lb/1000 gal	2.26E-05	9.89E-05	4.11E-05	D
Acenaphthene	83-32-9	2.11E-05	lb/1000 gal	4.37E-06	1.91E-05	7.97E-06	D, F
Acenaphthylene	203-96-8	2.53E-07	lb/1000 gal	5.24E-08	2.30E-07	9.55E-08	D, F
Anthracene	120-12-7	1.22E-06	lb/1000 gal	2.53E-07	1.11E-06	4.61E-07	D, F
Benz(a)anthracene	56-55-3	4.01E-06	lb/1000 gal	8.31E-07	3.64E-06	1.51E-06	D, F
Benzo(b,k)fluoranthene	205-99-2	1.48E-06	lb/1000 gal	3.07E-07	1.34E-06	5.59E-07	D, F
Benzo(g,h,i)perylene	191-24-2	2.26E-06	lb/1000 gal	4.68E-07	2.05E-06	8.53E-07	D, F
Chrysene	218-01-9	2.38E-06	lb/1000 gal	4.93E-07	2.16E-06	8.98E-07	D, F
Dibenzo(a,h)anthracene	53-70-3	1.67E-06	lb/1000 gal	3.46E-07	1.52E-06	6.30E-07	D, F
Fluoranthene	206-44-0	4.84E-06	lb/1000 gal	1.00E-06	4.39E-06	1.83E-06	D, F
Fluorene	86-73-7	4.47E-06	lb/1000 gal	9.26E-07	4.06E-06	1.69E-06	D, F
Indeno(1,2,3-cd)pyrene	193-39-5	2.14E-06	lb/1000 gal	4.43E-07	1.94E-06	8.08E-07	D, F
Phenanthrene	85-01-8	1.05E-05	lb/1000 gal	2.18E-06	9.53E-06	3.96E-06	D, F
Pyrene	129-00-0	4.25E-06	lb/1000 gal	8.80E-07	3.86E-06	1.60E-06	D, F
OCDD	3268-87-9	3.10E-09	lb/1000 gal	6.42E-10	2.81E-09	1.17E-09	D, F
Polycyclic Organic Matter (POM)		6.06E-05	lb/1000 gal	1.25E-05	5.50E-05	2.29E-05	
Metals							
Arsenic	7440-38-2	5.60E-04	lb/1000 gal	1.16E-04	5.08E-04	2.11E-04	E
Beryllium	7440-41-7	4.20E-04	lb/1000 gal	8.70E-05	3.81E-04	1.59E-04	E
Cadmium	7440-43-9	4.20E-04	lb/1000 gal	8.70E-05	3.81E-04	1.59E-04	E
Chromium	7440-47-3	4.20E-04	lb/1000 gal	8.70E-05	3.81E-04	1.59E-04	E
Copper	7440-50-8	8.40E-04	lb/1000 gal	1.74E-04	7.62E-04	3.17E-04	E
Lead	7139-92-1	1.26E-03	lb/1000 gal	2.61E-04	1.14E-03	4.76E-04	E
Manganese	7439-96-5	8.40E-04	lb/1000 gal	1.74E-04	7.62E-04	3.17E-04	E
Mercury	7439-97-6	4.20E-04	lb/1000 gal	8.70E-05	3.81E-04	1.59E-04	E
Nickel	7440-02-0	4.20E-04	lb/1000 gal	8.70E-05	3.81E-04	1.59E-04	E
Selenium	7782-49-2	2.10E-03	lb/1000 gal	4.35E-04	1.91E-03	7.93E-04	E
Zinc	7440-66-6	5.60E-04	lb/1000 gal	1.16E-04	5.08E-04	2.11E-04	E
Max HAP					2.99E-02	1.25E-02	
Total HAP					4.34E-02	1.81E-02	

## NOTES

A

AP-42 Table 1.3-1, 9/98

B

AP-42 Table 1.3-6, 9/98

C

Sulfur Content= 0.0015 % wt

D

AP-42 Table 1.3-9, 9/98

E

AP-42 Table 1.3-10, 9/98

F

This compound is considered polycyclic organic matter (POM)

G

AP-42 Table 1.3-12, 9/98

H

40 CFR Part 98 Table C-1: Pipeline natural gas = 0.138 btu/gal, CO<sub>2</sub> emission = 73.96 kg CO<sub>2</sub>/mmBtu = 22,501 lb/1000 gal

I

40 CFR Part 98 Table C-2: Pipeline natural gas = 0.138 btu/gal, CH<sub>4</sub> = 0.003 kg CH<sub>4</sub>/mmBtu, N<sub>2</sub>O = 0.0006 kg N<sub>2</sub>O / mmBtu

J

CO<sub>2</sub>e = (Global Warming Potential, GWP) \* (Emission). GWP from 40 CFR Part 98 Table A-1. CO<sub>2</sub> = 1, CH<sub>4</sub> = 21, N<sub>2</sub>O = 310

TABLE A6 : EU03 EMISSION CALCULATIONS (NATURAL GAS)							
Parameter	Value	Units	Source				
Emission Unit	EU003		MPCA Emission Unit ID				
Make	Bros		State operating permit application, November 1995				
Model	W2-37		State operating permit application, November 1995				
Maximum Heat Input	29	MMBtu/hr	State operating permit application, November 1995				
Fuel	Natural Gas						
Maximum Fuel Input	0.0284	MMSCF/hr	(Maximum Heat Input)/(Fuel Heat Value)				
Unlimited Annual Operation	8760	hr/yr	Number of hours in a year				
Unlimited Annual Fuel Input	249	MMSCF/yr	(Maximum Fuel Input) * (Unlimited Annual Operation)				
Annual Limit	525	MMSCF/yr	Permit limit for EU01-04				
Fuel Heat Value	1020	btu/scf	AP-42 Section 1.4				
Criteria Pollutants							
Pollutant	CAS	Emission Factor		Unlimited Emission Rate (lb/hr)	Unlimited Emission Rate (tpy)	Limited Emission Rate (tpy)	NOTES
PM		7.60	lb/MMSCF	0.216	0.95	0.95	A
PM10		7.60	lb/MMSCF	0.216	0.95	0.95	A
PM2.5		7.60	lb/MMSCF	0.216	0.95	0.95	A
SO <sub>2</sub>		0.60	lb/MMSCF	0.017	0.07	0.07	A
NOx		100.00	lb/MMSCF	2.843	12.45	12.45	B
VOC		5.50	lb/MMSCF	0.156	0.68	0.68	A
CO		84.00	lb/MMSCF	2.388	10.46	10.46	B
Greenhouse Gas (CO <sub>2</sub> e)				3,420	14,978	14,978	G
CO <sub>2</sub>		120161	lb/MMSCF	3,416	14,964	14,964	E
CH <sub>4</sub>		2.27E+00	lb/MMSCF	6.44E-02	2.82E-01	2.82E-01	F
N <sub>2</sub> O		2.27E-01	lb/MMSCF	6.44E-03	2.82E-02	2.82E-02	F
Organics							
Benzene	71-43-2	2.10E-03	lb/MMSCF	5.97E-05	2.62E-04	2.62E-04	C
Butane	106-97-8	2.10E+00	lb/MMSCF	5.97E-02	2.62E-01	2.62E-01	C
Dichlorobenzene	25321-22-6	1.20E-03	lb/MMSCF	3.41E-05	1.49E-04	1.49E-04	C
Ethane	74-84-0	3.10E+00	lb/MMSCF	8.81E-02	3.86E-01	3.86E-01	C
Formaldehyde	50-00-0	7.50E-02	lb/MMSCF	2.13E-03	9.34E-03	9.34E-03	C
Hexane	110-54-3	1.80E+00	lb/MMSCF	5.12E-02	2.24E-01	2.24E-01	C
Naphthalene	91-20-3	6.10E-04	lb/MMSCF	1.73E-05	7.60E-05	7.60E-05	C
Pentane	109-66-0	2.60E+00	lb/MMSCF	7.39E-02	3.24E-01	3.24E-01	C
Propane	74-98-6	1.60E+00	lb/MMSCF	4.55E-02	1.99E-01	1.99E-01	C
Toluene	108-88-3	3.40E-03	lb/MMSCF	9.67E-05	4.23E-04	4.23E-04	C
Acenaphthene	83-32-9	1.80E-06	lb/MMSCF	5.12E-08	2.24E-07	2.24E-07	C
Acenaphthylene	203-96-8	1.80E-06	lb/MMSCF	5.12E-08	2.24E-07	2.24E-07	C
Anthracene	120-12-7	2.40E-06	lb/MMSCF	6.82E-08	2.99E-07	2.99E-07	C
Benzo(a)anthracene	56-55-3	1.80E-06	lb/MMSCF	5.12E-08	2.24E-07	2.24E-07	C
Benzo(a)pyrene	50-32-8	1.20E-06	lb/MMSCF	3.41E-08	1.49E-07	1.49E-07	C
Benzo(b)fluoranthene	205-99-2	1.80E-06	lb/MMSCF	5.12E-08	2.24E-07	2.24E-07	C
Benzo(g,h,i)perylene	191-24-2	1.20E-06	lb/MMSCF	3.41E-08	1.49E-07	1.49E-07	C
Benzo(k)fluoranthene	205-82-3	1.80E-06	lb/MMSCF	5.12E-08	2.24E-07	2.24E-07	C
Chrysene	218-01-9	1.80E-06	lb/MMSCF	5.12E-08	2.24E-07	2.24E-07	C
Dibenzo(a,h)anthracene	53-70-3	1.20E-06	lb/MMSCF	3.41E-08	1.49E-07	1.49E-07	C
7,12-Dimethylbenz(a)anthracene	57-97-6	1.60E-05	lb/MMSCF	4.55E-07	1.99E-06	1.99E-06	C
Fluoranthene	206-44-0	3.00E-06	lb/MMSCF	8.53E-08	3.74E-07	3.74E-07	C
Fluorene	86-73-7	2.80E-06	lb/MMSCF	7.96E-08	3.49E-07	3.49E-07	C
Indeno(1,2,3-cd)pyrene	193-39-5	1.80E-06	lb/MMSCF	5.12E-08	2.24E-07	2.24E-07	C
2-Methylnaphthalene	91-57-6	2.40E-05	lb/MMSCF	6.82E-07	2.99E-06	2.99E-06	C
3-Methylchloranthrene	56-49-5	1.80E-06	lb/MMSCF	5.12E-08	2.24E-07	2.24E-07	C
Phenanthrene	85-01-8	1.70E-05	lb/MMSCF	4.83E-07	2.12E-06	2.12E-06	C
Pyrene	129-00-0	5.00E-05	lb/MMSCF	1.42E-06	6.23E-06	6.23E-06	C
Polycyclic Organic Matter (POM)		1.33E-04	lb/MMSCF	3.79E-06	1.66E-05	1.66E-05	
Metals							
Arsenic	7440-38-2	2.00E-04	lb/MMSCF	5.69E-06	2.49E-05	2.49E-05	D
Barium	7440-39-3	4.40E-03	lb/MMSCF	1.25E-04	5.48E-04	5.48E-04	D
Beryllium	7440-41-7	1.20E-05	lb/MMSCF	3.41E-07	1.49E-06	1.49E-06	D
Cadmium	7440-43-9	1.10E-03	lb/MMSCF	3.13E-05	1.37E-04	1.37E-04	D
Chromium	7440-47-3	1.40E-03	lb/MMSCF	3.98E-05	1.74E-04	1.74E-04	D
Cobalt	7440-48-4	8.40E-05	lb/MMSCF	2.39E-06	1.05E-05	1.05E-05	D
Copper	7440-50-8	8.50E-04	lb/MMSCF	2.42E-05	1.06E-04	1.06E-04	D
Lead	7139-92-1	5.00E-04	lb/MMSCF	1.42E-05	6.23E-05	6.23E-05	D
Manganese	7439-96-5	3.80E-04	lb/MMSCF	1.08E-05	4.73E-05	4.73E-05	D
Mercury	7439-97-6	2.60E-04	lb/MMSCF	7.39E-06	3.24E-05	3.24E-05	D
Molybdenum	7439-98-7	1.10E-03	lb/MMSCF	3.13E-05	1.37E-04	1.37E-04	D
Nickel	7440-02-0	2.10E-03	lb/MMSCF	5.97E-05	2.62E-04	2.62E-04	D
Selenium	7782-49-2	2.40E-05	lb/MMSCF	6.82E-07	2.99E-06	2.99E-06	D
Vanadium	7440-62-2	2.30E-03	lb/MMSCF	6.54E-05	2.86E-04	2.86E-04	D
Zinc	7440-66-6	2.90E-02	lb/MMSCF	8.25E-04	3.61E-03	3.61E-03	D
Max HAP					2.24E-01	2.24E-01	
Total HAP					2.35E-01	2.35E-01	

## NOTES

A

AP-42 Table 1.4-2

B

AP-42 Table 1.4-1

C

AP-42 Table 1.4-3

D

AP-42 Table 1.4-4

E

40 CFR Part 98 Table C-1: Pipeline natural gas = 1028 btu/scf, CO<sub>2</sub> emission = 53.02 kg CO<sub>2</sub>/mmBtu = 120162 lb/MMscf

F

40 CFR Part 98 Table C-2: Pipeline natural gas = 1028 btu/scf, CH<sub>4</sub> = 0.001 kg CH<sub>4</sub>/mmBtu, N<sub>2</sub>O = 0.0001 kg N<sub>2</sub>O / mmBtu

G

CO<sub>2</sub>e = (Global Warming Potential, GWP) \* (Emission). GWP from 40 CFR Part 98 Table A-1. CO<sub>2</sub> = 1, CH<sub>4</sub> = 21, N<sub>2</sub>O = 310

TABLE A7 : EU03 EMISSION CALCULATIONS (FUEL OIL)							
Parameter	Value	Units		Source			
Emission Unit	EU003			MPCA Emission Unit ID			
Make	Bros			State operating permit application, November 1995			
Model	W2-37			State operating permit application, November 1995			
Maximum Heat Input	29	MMBtu/hr		State operating permit application, November 1995			
Fuel	No 2 Fuel Oil						
Maximum Fuel Input	207.1	gal/hr		(Maximum Heat Input)/(Fuel Heat Value)			
Unlimited Annual Operation	8760	hr/yr		Number of hours in a year			
Unlimited Annual Fuel Input	1,814,571	gal/yr		(Maximum Fuel Input) * (Unlimited Annual Operation)			
Annual Limit	755,000	gal/yr		Permit limit for EU01-04			
Fuel Heat Value	0.14	MMBtu/gal		AP-42 Section 1.4			
Criteria Pollutants							
Pollutant	CAS	Emission Factor		Unlimited Emission Rate (lb/hr)	Unlimited Emission Rate (tpy)	Limited Emission Rate (tpy)	NOTES
PM		3.30	lb/1000 gal	0.684	2.99	1.25	A
PM10		2.30	lb/1000 gal	0.476	2.09	0.87	B
PM2.5		1.55	lb/1000 gal	0.321	1.41	0.59	B
SO2		0.21	lb/1000 gal	0.044	0.19	0.08	A, C
NOx		20.00	lb/1000 gal	4.143	18.15	7.55	A
VOC		0.56	lb/1000 gal	0.115	0.50	0.21	A
CO		5.00	lb/1000 gal	1.036	4.54	1.89	A
Greenhouse Gas (CO <sub>2</sub> e)				4,677	20,484	8,523	J
CO <sub>2</sub>		22501	lb/1000 gal	4,661	20,415	8,494	H
CH <sub>4</sub>		9.13E-01	lb/1000 gal	0.19	8.28E-01	3.45E-01	I
N <sub>2</sub> O		1.83E-01	lb/1000 gal	0.04	1.66E-01	6.89E-02	I
Organics							
Benzene	71-43-2	2.14E-04	lb/1000 gal	4.43E-05	1.94E-04	8.08E-05	D
Ethylbenzene	100-41-4	6.36E-05	lb/1000 gal	1.32E-05	5.77E-05	2.40E-05	D
Formaldehyde	50-00-0	3.30E-02	lb/1000 gal	6.84E-03	2.99E-02	1.25E-02	D
Naphthalene	91-20-3	1.13E-03	lb/1000 gal	2.34E-04	1.03E-03	4.27E-04	D
1,1,1-Trichloroethane	71-55-6	2.36E-04	lb/1000 gal	4.89E-05	2.14E-04	8.91E-05	D
Toluene	108-88-3	6.20E-03	lb/1000 gal	1.28E-03	5.63E-03	2.34E-03	D
Xylene (o,m,p)	1332-20-7	1.09E-04	lb/1000 gal	2.26E-05	9.89E-05	4.11E-05	D
Acenaphthene	83-32-9	2.11E-05	lb/1000 gal	4.37E-06	1.91E-05	7.97E-06	D, F
Acenaphthylene	203-96-8	2.53E-07	lb/1000 gal	5.24E-08	2.30E-07	9.55E-08	D, F
Anthracene	120-12-7	1.22E-06	lb/1000 gal	2.53E-07	1.11E-06	4.61E-07	D, F
Benz(a)anthracene	56-55-3	4.01E-06	lb/1000 gal	8.31E-07	3.64E-06	1.51E-06	D, F
Benzo(b,k)fluoranthene	205-99-2	1.48E-06	lb/1000 gal	3.07E-07	1.34E-06	5.59E-07	D, F
Benzo(g,h,i)perylene	191-24-2	2.26E-06	lb/1000 gal	4.68E-07	2.05E-06	8.53E-07	D, F
Chrysene	218-01-9	2.38E-06	lb/1000 gal	4.93E-07	2.16E-06	8.98E-07	D, F
Dibenzo(a,h)anthracene	53-70-3	1.67E-06	lb/1000 gal	3.46E-07	1.52E-06	6.30E-07	D, F
Fluoranthene	206-44-0	4.84E-06	lb/1000 gal	1.00E-06	4.39E-06	1.83E-06	D, F
Fluorene	86-73-7	4.47E-06	lb/1000 gal	9.26E-07	4.06E-06	1.69E-06	D, F
Indeno(1,2,3-cd)pyrene	193-39-5	2.14E-06	lb/1000 gal	4.43E-07	1.94E-06	8.08E-07	D, F
Phenanthrene	85-01-8	1.05E-05	lb/1000 gal	2.18E-06	9.53E-06	3.96E-06	D, F
Pyrene	129-00-0	4.25E-06	lb/1000 gal	8.80E-07	3.86E-06	1.60E-06	D, F
OCDD	3268-87-9	3.10E-09	lb/1000 gal	6.42E-10	2.81E-09	1.17E-09	D, F
Polycyclic Organic Matter (POM)		6.06E-05	lb/1000 gal	1.25E-05	5.50E-05	2.29E-05	
Metals							
Arsenic	7440-38-2	5.60E-04	lb/1000 gal	1.16E-04	5.08E-04	2.11E-04	E
Beryllium	7440-41-7	4.20E-04	lb/1000 gal	8.70E-05	3.81E-04	1.59E-04	E
Cadmium	7440-43-9	4.20E-04	lb/1000 gal	8.70E-05	3.81E-04	1.59E-04	E
Chromium	7440-47-3	4.20E-04	lb/1000 gal	8.70E-05	3.81E-04	1.59E-04	E
Copper	7440-50-8	8.40E-04	lb/1000 gal	1.74E-04	7.62E-04	3.17E-04	E
Lead	7139-92-1	1.26E-03	lb/1000 gal	2.61E-04	1.14E-03	4.76E-04	E
Manganese	7439-96-5	8.40E-04	lb/1000 gal	1.74E-04	7.62E-04	3.17E-04	E
Mercury	7439-97-6	4.20E-04	lb/1000 gal	8.70E-05	3.81E-04	1.59E-04	E
Nickel	7440-02-0	4.20E-04	lb/1000 gal	8.70E-05	3.81E-04	1.59E-04	E
Selenium	7782-49-2	2.10E-03	lb/1000 gal	4.35E-04	1.91E-03	7.93E-04	E
Zinc	7440-66-6	5.60E-04	lb/1000 gal	1.16E-04	5.08E-04	2.11E-04	E
Max HAP					2.99E-02	1.25E-02	
Total HAP					4.34E-02	1.81E-02	

## NOTES

A

AP-42 Table 1.3-1, 9/98

B

AP-42 Table 1.3-6, 9/98

C

Sulfur Content= 0.0015 % wt

D

AP-42 Table 1.3-9, 9/98

E

AP-42 Table 1.3-10, 9/98

F

This compound is considered polycyclic organic matter (POM)

G

AP-42 Table 1.3-12, 9/98

H

40 CFR Part 98 Table C-1: Pipeline natural gas = 0.138 btu/gal, CO<sub>2</sub> emission = 73.96 kg CO<sub>2</sub>/mmBtu = 22,501 lb/1000 gal

I

40 CFR Part 98 Table C-2: Pipeline natural gas = 0.138 btu/gal, CH<sub>4</sub> = 0.003 kg CH<sub>4</sub>/mmBtu, N<sub>2</sub>O = 0.0006 kg N<sub>2</sub>O / mmBtu

J

CO<sub>2</sub>e = (Global Warming Potential, GWP) \* (Emission). GWP from 40 CFR Part 98 Table A-1. CO<sub>2</sub> = 1, CH<sub>4</sub> = 21, N<sub>2</sub>O = 310

TABLE A8 : EU04 EMISSION CALCULATIONS (NATURAL GAS)							
Parameter	Value	Units	Source				
Emission Unit	EU004		MPCA Emission Unit ID				
Make	Cleaver Brooks		State operating permit application, November 1995				
Model	WT 439X-CN6		State operating permit application, November 1995				
Maximum Heat Input	77	MMBtu/hr	State operating permit application, November 1995				
Fuel	Natural Gas						
Maximum Fuel Input	0.0755	MMSCF/hr	(Maximum Heat Input)/(Fuel Heat Value)				
Unlimited Annual Operation	8760	hr/yr	Number of hours in a year				
Unlimited Annual Fuel Input	661	MMSCF/yr	(Maximum Fuel Input) * (Unlimited Annual Operation)				
Annual Limit	525	MMSCF/yr	Permit limit for EU01-04				
Fuel Heat Value	1020	btu/scf	AP-42 Section 1.4				
Criteria Pollutants							
Pollutant	CAS	Emission Factor		Unlimited Emission Rate (lb/hr)	Unlimited Emission Rate (tpy)	Limited Emission Rate (tpy)	NOTES
PM		7.60	lb/MMSCF	0.574	2.51	2.00	A
PM10		7.60	lb/MMSCF	0.574	2.51	2.00	A
PM2.5		7.60	lb/MMSCF	0.574	2.51	2.00	A
SO <sub>2</sub>		0.60	lb/MMSCF	0.045	0.20	0.16	A
NO <sub>x</sub>		100.00	lb/MMSCF	7.549	33.06	26.25	B
VOC		5.50	lb/MMSCF	0.415	1.82	1.44	A
CO		84.00	lb/MMSCF	6.341	27.77	22.05	B
Greenhouse Gas (CO <sub>2</sub> e)				9,080	39,770	31,573	G
CO <sub>2</sub>		120161	lb/MMSCF	9,071	39,731	31,542	E
CH <sub>4</sub>		2.27E+00	lb/MMSCF	1.71E-01	7.49E-01	5.95E-01	F
N <sub>2</sub> O		2.27E-01	lb/MMSCF	1.71E-02	7.49E-02	5.95E-02	F
Organics							
Benzene	71-43-2	2.10E-03	lb/MMSCF	1.59E-04	6.94E-04	5.51E-04	C
Butane	106-97-8	2.10E+00	lb/MMSCF	1.59E-01	6.94E-01	5.51E-01	C
Dichlorobenzene	25321-22-6	1.20E-03	lb/MMSCF	9.06E-05	3.97E-04	3.15E-04	C
Ethane	74-84-0	3.10E+00	lb/MMSCF	2.34E-01	1.03E+00	8.14E-01	C
Formaldehyde	50-00-0	7.50E-02	lb/MMSCF	5.66E-03	2.48E-02	1.97E-02	C
Hexane	110-54-3	1.80E+00	lb/MMSCF	1.36E-01	5.95E-01	4.73E-01	C
Naphthalene	91-20-3	6.10E-04	lb/MMSCF	4.60E-05	2.02E-04	1.60E-04	C
Pentane	109-66-0	2.60E+00	lb/MMSCF	1.96E-01	8.60E-01	6.83E-01	C
Propane	74-98-6	1.60E+00	lb/MMSCF	1.21E-01	5.29E-01	4.20E-01	C
Toluene	108-88-3	3.40E-03	lb/MMSCF	2.57E-04	1.12E-03	8.93E-04	C
Acenaphthene	83-32-9	1.80E-06	lb/MMSCF	1.36E-07	5.95E-07	4.73E-07	C
Acenaphthylene	203-96-8	1.80E-06	lb/MMSCF	1.36E-07	5.95E-07	4.73E-07	C
Anthracene	120-12-7	2.40E-06	lb/MMSCF	1.81E-07	7.94E-07	6.30E-07	C
Benzo(a)anthracene	56-55-3	1.80E-06	lb/MMSCF	1.36E-07	5.95E-07	4.73E-07	C
Benzo(a)pyrene	50-32-8	1.20E-06	lb/MMSCF	9.06E-08	3.97E-07	3.15E-07	C
Benzo(b)fluoranthene	205-99-2	1.80E-06	lb/MMSCF	1.36E-07	5.95E-07	4.73E-07	C
Benzo(g,h,i)perylene	191-24-2	1.20E-06	lb/MMSCF	9.06E-08	3.97E-07	3.15E-07	C
Benzo(k)fluoranthene	205-82-3	1.80E-06	lb/MMSCF	1.36E-07	5.95E-07	4.73E-07	C
Chrysene	218-01-9	1.80E-06	lb/MMSCF	1.36E-07	5.95E-07	4.73E-07	C
Dibenzo(a,h)anthracene	53-70-3	1.20E-06	lb/MMSCF	9.06E-08	3.97E-07	3.15E-07	C
7,12-Dimethylbenz(a)anthracene	57-97-6	1.60E-05	lb/MMSCF	1.21E-06	5.29E-06	4.20E-06	C
Fluoranthene	206-44-0	3.00E-06	lb/MMSCF	2.26E-07	9.92E-07	7.88E-07	C
Fluorene	86-73-7	2.80E-06	lb/MMSCF	2.11E-07	9.26E-07	7.35E-07	C
Indeno(1,2,3-cd)pyrene	193-39-5	1.80E-06	lb/MMSCF	1.36E-07	5.95E-07	4.73E-07	C
2-Methylnaphthalene	91-57-6	2.40E-05	lb/MMSCF	1.81E-06	7.94E-06	6.30E-06	C
3-Methylchloranthrene	56-49-5	1.80E-06	lb/MMSCF	1.36E-07	5.95E-07	4.73E-07	C
Phenanthrene	85-01-8	1.70E-05	lb/MMSCF	1.28E-06	5.62E-06	4.46E-06	C
Pyrene	129-00-0	5.00E-05	lb/MMSCF	3.77E-06	1.65E-05	1.31E-05	C
Polycyclic Organic Matter (POM)		1.33E-04	lb/MMSCF	1.01E-05	4.40E-05	3.50E-05	
Metals							
Arsenic	7440-38-2	2.00E-04	lb/MMSCF	1.51E-05	6.61E-05	5.25E-05	D
Barium	7440-39-3	4.40E-03	lb/MMSCF	3.32E-04	1.45E-03	1.16E-03	D
Beryllium	7440-41-7	1.20E-05	lb/MMSCF	9.06E-07	3.97E-06	3.15E-06	D
Cadmium	7440-43-9	1.10E-03	lb/MMSCF	8.30E-05	3.64E-04	2.89E-04	D
Chromium	7440-47-3	1.40E-03	lb/MMSCF	1.06E-04	4.63E-04	3.68E-04	D
Cobalt	7440-48-4	8.40E-05	lb/MMSCF	6.34E-06	2.78E-05	2.21E-05	D
Copper	7440-50-8	8.50E-04	lb/MMSCF	6.42E-05	2.81E-04	2.23E-04	D
Lead	7139-92-1	5.00E-04	lb/MMSCF	3.77E-05	1.65E-04	1.31E-04	D
Manganese	7439-96-5	3.80E-04	lb/MMSCF	2.87E-05	1.26E-04	9.98E-05	D
Mercury	7439-97-6	2.60E-04	lb/MMSCF	1.96E-05	8.60E-05	6.83E-05	D
Molybdenum	7439-98-7	1.10E-03	lb/MMSCF	8.30E-05	3.64E-04	2.89E-04	D
Nickel	7440-02-0	2.10E-03	lb/MMSCF	1.59E-04	6.94E-04	5.51E-04	D
Selenium	7782-49-2	2.40E-05	lb/MMSCF	1.81E-06	7.94E-06	6.30E-06	D
Vanadium	7440-62-2	2.30E-03	lb/MMSCF	1.74E-04	7.60E-04	6.04E-04	D
Zinc	7440-66-6	2.90E-02	lb/MMSCF	2.19E-03	9.59E-03	7.61E-03	D
Max HAP					5.95E-01	4.73E-01	
Total HAP					6.24E-01	4.96E-01	

## NOTES

- A AP-42 Table 1.4-2
- B AP-42 Table 1.4-1
- C AP-42 Table 1.4-3
- D AP-42 Table 1.4-4
- E 40 CFR Part 98 Table C-1: Pipeline natural gas = 1028 btu/scf, CO<sub>2</sub> emission = 53.02 kg CO<sub>2</sub>/mmBtu = 120162 lb/MMscf
- F 40 CFR Part 98 Table C-2: Pipeline natural gas = 1028 btu/scf, CH<sub>4</sub> = 0.001 kg CH<sub>4</sub>/mmBtu, N<sub>2</sub>O = 0.0001 kg N<sub>2</sub>O / mmBtu
- G CO<sub>2</sub>e = (Global Warming Potential, GWP) \* (Emission). GWP from 40 CFR Part 98 Table A-1. CO<sub>2</sub> = 1, CH<sub>4</sub> = 21, N<sub>2</sub>O = 310

TABLE A9 : EU04 EMISSION CALCULATIONS (FUEL OIL)						
Parameter	Value	Units	Source			
Emission Unit	EU004		MPCA Emission Unit ID			
Make	Cleaver Brooks		State operating permit application, November 1995			
Model	WT 439X-CN6		State operating permit application, November 1995			
Maximum Heat Input	77	MMBtu/hr	State operating permit application, November 1995			
Fuel	No 2 Fuel Oil					
Maximum Fuel Input	550.0	gal/hr	(Maximum Heat Input)/(Fuel Heat Value)			
Unlimited Annual Operation	8760	hr/yr	Number of hours in a year			
Unlimited Annual Fuel Input	4,818,000	gal/yr	(Maximum Fuel Input) * (Unlimited Annual Operation)			
Annual Limit	755,000	gal/yr	Permit limit for EU01-04			
Fuel Heat Value	0.14	MMBtu/gal	AP-42 Section 1.4			
Criteria Pollutants						
Pollutant	CAS	Emission Factor	Unlimited Emission Rate (lb/hr)	Unlimited Emission Rate (tpy)	Limited Emission Rate (tpy)	NOTES
PM		3.30 lb/1000 gal	1.815	7.95	1.25	A
PM10		2.30 lb/1000 gal	1.265	5.54	0.87	B
PM2.5		1.55 lb/1000 gal	0.853	3.73	0.59	B
SO2		0.21 lb/1000 gal	0.117	0.51	0.08	A, C
NOx		20.00 lb/1000 gal	11.000	48.18	7.55	A
VOC		0.56 lb/1000 gal	0.306	1.34	0.21	A
CO		5.00 lb/1000 gal	2.750	12.05	1.89	A
Greenhouse Gas (CO <sub>2</sub> e)			12,417	54,388	8,523	J
CO <sub>2</sub>		22501 lb/1000 gal	12,376	54,205	8,494	H
CH <sub>4</sub>		9.13E-01 lb/1000 gal	0.50	2.20E+00	3.45E-01	I
N <sub>2</sub> O		1.83E-01 lb/1000 gal	0.10	4.40E-01	6.89E-02	I
Organics						
Benzene	71-43-2	2.14E-04 lb/1000 gal	1.18E-04	5.16E-04	8.08E-05	D
Ethylbenzene	100-41-4	6.36E-05 lb/1000 gal	3.50E-05	1.53E-04	2.40E-05	D
Formaldehyde	50-00-0	3.30E-02 lb/1000 gal	1.82E-02	7.95E-02	1.25E-02	D
Naphthalene	91-20-3	1.13E-03 lb/1000 gal	6.22E-04	2.72E-03	4.27E-04	D
1,1,1-Trichloroethane	71-55-6	2.36E-04 lb/1000 gal	1.30E-04	5.69E-04	8.91E-05	D
Toluene	108-88-3	6.20E-03 lb/1000 gal	3.41E-03	1.49E-02	2.34E-03	D
Xylene (o,m,p)	1332-20-7	1.09E-04 lb/1000 gal	6.00E-05	2.63E-04	4.11E-05	D
Acenaphthene	83-32-9	2.11E-05 lb/1000 gal	1.16E-05	5.08E-05	7.97E-06	D, F
Acenaphthylene	203-96-8	2.53E-07 lb/1000 gal	1.39E-07	6.09E-07	9.55E-08	D, F
Anthracene	120-12-7	1.22E-06 lb/1000 gal	6.71E-07	2.94E-06	4.61E-07	D, F
Benzo(a)anthracene	56-55-3	4.01E-06 lb/1000 gal	2.21E-06	9.66E-06	1.51E-06	D, F
Benzo(b,k)fluoranthene	205-99-2	1.48E-06 lb/1000 gal	8.14E-07	3.57E-06	5.59E-07	D, F
Benzo(g,h,i)perylene	191-24-2	2.26E-06 lb/1000 gal	1.24E-06	5.44E-06	8.53E-07	D, F
Chrysene	218-01-9	2.38E-06 lb/1000 gal	1.31E-06	5.73E-06	8.98E-07	D, F
Dibenzo(a,h)anthracene	53-70-3	1.67E-06 lb/1000 gal	9.19E-07	4.02E-06	6.30E-07	D, F
Fluoranthene	206-44-0	4.84E-06 lb/1000 gal	2.66E-06	1.17E-05	1.83E-06	D, F
Fluorene	86-73-7	4.47E-06 lb/1000 gal	2.46E-06	1.08E-05	1.69E-06	D, F
Indeno(1,2,3-cd)pyrene	193-39-5	2.14E-06 lb/1000 gal	1.18E-06	5.16E-06	8.08E-07	D, F
Phenanthrene	85-01-8	1.05E-05 lb/1000 gal	5.78E-06	2.53E-05	3.96E-06	D, F
Pyrene	129-00-0	4.25E-06 lb/1000 gal	2.34E-06	1.02E-05	1.60E-06	D, F
OCDD	3268-87-9	3.10E-09 lb/1000 gal	1.71E-09	7.47E-09	1.17E-09	D, F
Polycyclic Organic Matter (POM)		6.06E-05 lb/1000 gal	3.33E-05	1.46E-04	2.29E-05	
Metals						
Arsenic	7440-38-2	5.60E-04 lb/1000 gal	3.08E-04	1.35E-03	2.11E-04	E
Beryllium	7440-41-7	4.20E-04 lb/1000 gal	2.31E-04	1.01E-03	1.59E-04	E
Cadmium	7440-43-9	4.20E-04 lb/1000 gal	2.31E-04	1.01E-03	1.59E-04	E
Chromium	7440-47-3	4.20E-04 lb/1000 gal	2.31E-04	1.01E-03	1.59E-04	E
Copper	7440-50-8	8.40E-04 lb/1000 gal	4.62E-04	2.02E-03	3.17E-04	E
Lead	7139-92-1	1.26E-03 lb/1000 gal	6.93E-04	3.04E-03	4.76E-04	E
Manganese	7439-96-5	8.40E-04 lb/1000 gal	4.62E-04	2.02E-03	3.17E-04	E
Mercury	7439-97-6	4.20E-04 lb/1000 gal	2.31E-04	1.01E-03	1.59E-04	E
Nickel	7440-02-0	4.20E-04 lb/1000 gal	2.31E-04	1.01E-03	1.59E-04	E
Selenium	7782-49-2	2.10E-03 lb/1000 gal	1.16E-03	5.06E-03	7.93E-04	E
Zinc	7440-66-6	5.60E-04 lb/1000 gal	3.08E-04	1.35E-03	2.11E-04	E
Max HAP				7.95E-02	1.25E-02	
Total HAP				1.15E-01	1.81E-02	

## NOTES

- A AP-42 Table 1.3-1, 9/98
- B AP-42 Table 1.3-6, 9/98
- C Sulfur Content= 0.0015 % wt
- D AP-42 Table 1.3-9, 9/98
- E AP-42 Table 1.3-10, 9/98
- F This compound is considered polycyclic organic matter (POM)
- G AP-42 Table 1.3-12, 9/98
- H 40 CFR Part 98 Table C-1: Pipeline natural gas = 0.138 btu/gal, CO<sub>2</sub> emission = 73.96 kg CO<sub>2</sub>/mmBtu = 22,501 lb/1000 gal
- I 40 CFR Part 98 Table C-2: Pipeline natural gas = 0.138 btu/gal, CH<sub>4</sub> = 0.003 kg CH<sub>4</sub>/mmBtu, N<sub>2</sub>O = 0.0006 kg N<sub>2</sub>O / mmBtu
- J CO<sub>2</sub>e = (Global Warming Potential, GWP) \* (Emission). GWP from 40 CFR Part 98 Table A-1. CO<sub>2</sub> = 1, CH<sub>4</sub> = 21, N<sub>2</sub>O = 310



TABLE A10 : GP01 EMISSION CALCULATION SUMMARY							
Parameter	Value	Units	Source				
Emission Unit	GP001		MPCA Emission Unit ID				
Annual Fuel Oil Limit	755,000	gal/yr	State operating permit application, November 1995				
Natural Gas Limit	525	MMSCF/yr	State operating permit application, November 1995				
Criteria Pollutants							
Pollutant	CAS	Emission Rate (Natural Gas) (lb/hr)	Emission Rate (Fuel Oil) (lb/hr)	Unlimited Emission Rate (tpy)	Limited Fuel Oil Emissions (tpy)	Limited NG Emissions (tpy)	Limited Maximum Emissions (tpy)
PM		1.22	3.87	16.9	1.25	2.00	3.24
PM10		1.22	2.69	11.8	0.87	2.00	2.86
PM2.5		1.22	1.82	8.0	0.59	2.00	2.58
SO2		0.10	0.25	1.1	0.08	0.16	0.24
NOx		16.08	23.43	102.6	7.55	26.25	33.80
VOC		0.88	0.65	3.9	0.21	1.44	1.65
CO		13.51	5.86	59.2	1.89	22.05	23.94
Greenhouse Gas (CO <sub>2</sub> e)		19,339	26,447	115,839	8,523	31,573	40,096
CO <sub>2</sub>		19,320	26,359	115,450	8,494	31,542	40,036
CH <sub>4</sub>		0.36	1.07	4.7	3.45E-01	5.95E-01	9.39E-01
N <sub>2</sub> O		0.04	0.21	0.9	6.89E-02	5.95E-02	1.28E-01
Organics							
Benzene	71-43-2	3.38E-04	2.51E-04	1.48E-03	8.08E-05	5.51E-04	6.32E-04
Butane	106-97-8	3.38E-01	0.00E+00	1.48E+00	0.00E+00	5.51E-01	5.51E-01
Dichlorobenzene	25321-22-6	1.93E-04	0.00E+00	8.45E-04	0.00E+00	3.15E-04	3.15E-04
Ethylbenzene	100-41-4	0.00E+00	7.45E-05	3.26E-04	2.40E-05	0.00E+00	2.40E-05
Ethane	74-84-0	4.98E-01	0.00E+00	2.18E+00	0.00E+00	8.14E-01	8.14E-01
Formaldehyde	50-00-0	1.21E-02	3.87E-02	1.69E-01	1.25E-02	1.97E-02	3.21E-02
Hexane	110-54-3	2.89E-01	0.00E+00	1.27E+00	0.00E+00	4.73E-01	4.73E-01
Naphthalene	91-20-3	9.81E-05	1.32E-03	5.80E-03	4.27E-04	1.60E-04	5.87E-04
Pentane	109-66-0	4.18E-01	0.00E+00	1.83E+00	0.00E+00	6.83E-01	6.83E-01
Propane	74-98-6	2.57E-01	0.00E+00	1.13E+00	0.00E+00	4.20E-01	4.20E-01
1,1,1-Trichloroethane	71-55-6	0.00E+00	2.76E-04	1.21E-03	8.91E-05	0.00E+00	8.91E-05
Toluene	108-88-3	5.47E-04	7.26E-03	3.18E-02	2.34E-03	8.93E-04	3.23E-03
Xylene (o,m,p)	1332-20-7	0.00E+00	1.28E-04	5.59E-04	4.11E-05	0.00E+00	4.11E-05
Acenaphthene	83-32-9	2.89E-07	2.47E-05	1.08E-04	7.97E-06	4.73E-07	8.44E-06
Acenaphthylene	203-96-8	2.89E-07	2.96E-07	1.30E-06	9.55E-08	4.73E-07	5.68E-07
Anthracene	120-12-7	3.86E-07	1.43E-06	6.26E-06	4.61E-07	6.30E-07	1.09E-06
Benz(a)anthracene	56-55-3	2.89E-07	4.70E-06	2.06E-05	1.51E-06	4.73E-07	1.99E-06
Benzo(a)pyrene	50-32-8	1.93E-07	0.00E+00	8.45E-07	0.00E+00	3.15E-07	3.15E-07
Benzo(b)fluoranthene	205-99-2	2.89E-07	0.00E+00	1.27E-06	0.00E+00	4.73E-07	4.73E-07
Benzo(b,k)fluoranthene	205-99-2	0.00E+00	1.73E-06	7.59E-06	5.59E-07	0.00E+00	5.59E-07
Benzo(g,h,i)perylene	191-24-2	1.93E-07	2.65E-06	1.16E-05	8.53E-07	3.15E-07	1.17E-06
Benzo(k)fluoranthene	205-82-3	2.89E-07	0.00E+00	1.27E-06	0.00E+00	4.73E-07	4.73E-07
Chrysene	218-01-9	2.89E-07	2.79E-06	1.22E-05	8.98E-07	4.73E-07	1.37E-06
Dibenzo(a,h)anthracene	53-70-3	1.93E-07	1.96E-06	8.57E-06	6.30E-07	3.15E-07	9.45E-07
7,12-Dimethylbenz(a)anthracene	57-97-6	2.57E-06	0.00E+00	1.13E-05	0.00E+00	4.20E-06	4.20E-06
Fluoranthene	206-44-0	4.82E-07	5.67E-06	2.48E-05	1.83E-06	7.88E-07	2.61E-06
Fluorene	86-73-7	4.50E-07	5.24E-06	2.29E-05	1.69E-06	7.35E-07	2.42E-06
Indeno(1,2,3-cd)pyrene	193-39-5	2.89E-07	2.51E-06	1.10E-05	8.08E-07	4.73E-07	1.28E-06
2-Methylnaphthalene	91-57-6	3.86E-06	0.00E+00	1.69E-05	0.00E+00	6.30E-06	6.30E-06
3-Methylchloranthrene	56-49-5	2.89E-07	0.00E+00	1.27E-06	0.00E+00	4.73E-07	4.73E-07
Phenanthrene	85-01-8	2.73E-06	1.23E-05	5.39E-05	3.96E-06	4.46E-06	8.43E-06
Pyrene	129-00-0	8.04E-06	4.98E-06	3.52E-05	1.60E-06	1.31E-05	1.47E-05
OCDD	3268-87-9	0.00E+00	3.63E-09	1.59E-08	1.17E-09	0.00E+00	1.17E-09
Polycyclic Organic Matter (POM)		2.14E-05	7.10E-05	3.11E-04	2.29E-05	3.50E-05	5.78E-05
Metals							
Arsenic	7440-38-2	3.22E-05	6.56E-04	2.87E-03	2.11E-04	5.25E-05	2.64E-04
Barium	7440-39-3	7.07E-04	0.00E+00	3.10E-03	0.00E+00	1.16E-03	1.16E-03
Beryllium	7440-41-7	1.93E-06	4.92E-04	2.15E-03	1.59E-04	3.15E-06	1.62E-04
Cadmium	7440-43-9	1.77E-04	4.92E-04	2.15E-03	1.59E-04	2.89E-04	4.47E-04
Chromium	7440-47-3	2.25E-04	4.92E-04	2.15E-03	1.59E-04	3.68E-04	5.26E-04
Cobalt	7440-48-4	1.35E-05	0.00E+00	5.92E-05	0.00E+00	2.21E-05	2.21E-05
Copper	7440-50-8	1.37E-04	9.84E-04	4.31E-03	3.17E-04	2.23E-04	5.40E-04
Lead	7139-92-1	8.04E-05	1.48E-03	6.46E-03	4.76E-04	1.31E-04	6.07E-04
Manganese	7439-96-5	6.11E-05	9.84E-04	4.31E-03	3.17E-04	9.98E-05	4.17E-04
Mercury	7439-97-6	4.18E-05	4.92E-04	2.15E-03	1.59E-04	6.83E-05	2.27E-04
Molybdenum	7439-98-7	1.77E-04	0.00E+00	7.75E-04	0.00E+00	2.89E-04	2.89E-04
Nickel	7440-02-0	3.38E-04	4.92E-04	2.15E-03	1.59E-04	5.51E-04	7.10E-04
Selenium	7782-49-2	3.86E-06	2.46E-03	1.08E-02	7.93E-04	6.30E-06	7.99E-04
Vanadium	7440-62-2	3.70E-04	0.00E+00	1.62E-03	0.00E+00	6.04E-04	6.04E-04
Zinc	7440-66-6	4.66E-03	6.56E-04	2.04E-02	2.11E-04	7.61E-03	7.82E-03
Max HAP					1.25E-02	4.73E-01	4.73E-01
Total HAP					1.81E-02	4.96E-01	5.14E-01

## NOTES

Please refer to Tables 2-9 for detailed calculations for each emission unit in GP001.



TABLE A11 : EU05 EMISSION CALCULATIONS (FUEL OIL)

TABLE A11 : EU05 EMISSION CALCULATIONS (FUEL OIL)							
Parameter	Value	Units	Source				
Emission Unit	EU05		MPCA Emission Unit ID				
Make	Cummins		State operating permit application, November 1995				
Model	VT-1710-GS		State operating permit application, November 1995				
Maximum Output	685	bhp	State operating permit application, November 1995				
Fuel	No 2 Fuel Oil						
Maximum Fuel Input	32.54	gal/hr					
Unlimited Annual Operation	8760	hr/yr	Assumed because generator can participate in a peak shaving program				
Unlimited Annual Fuel Input	285,050	gal/yr	(Maximum Fuel Input) * (Unlimited Annual Operation)				
Annual Limit	300	hr/yr	Permit Limit				
Fuel Heat Value	0.14	MMBtu/gal	AP-42 Section 1.3				
Maximum Heat Input	4.56	MMBtu/hr	(Maximum Fuel Input) * (Fuel Heat Value)				
Criteria Pollutants							
Pollutant	CAS	Emission Factor		Unlimited Emission Rate (lb/hr)	Unlimited Emission Rate (tpy)	Limited Emission Rate (tpy)	NOTES
PM		0.0697	lb/MMBtu	0.318	1.39	0.05	C
PM10		0.0573	lb/MMBtu	0.261	1.14	0.04	C
PM2.5		0.0556	lb/MMBtu	0.253	1.11	0.04	C
SO2		0.00	lb/MMBtu	0.007	0.03	0.00	A, B
NOx		3.20	lb/MMBtu	14.578	63.85	2.19	A
VOC		0.09	lb/MMBtu	0.410	1.80	0.06	A
CO		0.85	lb/MMBtu	3.872	16.96	0.58	A
Greenhouse Gas (CO <sub>2</sub> e)		163.60	lb/MMBtu	745.301	3,264	112	G
CO2		163.1	lb/MMBtu	742.801	3,253	111	E
CH <sub>4</sub>		0.007	lb/MMBtu	0.030	0	0	F
N <sub>2</sub> O		0.001	lb/MMBtu	0.006	0	0	F
Organics							
Acetaldehyde	75-07-0	2.52E-05	lb/MMBtu	8.20E-07	3.59E-06	1.23E-07	D
Acrolein	107-02-8	7.88E-06	lb/MMBtu	2.56E-07	1.12E-06	3.85E-08	D
Benzene	71-43-2	7.76E-04	lb/MMBtu	3.54E-03	1.55E-02	5.30E-04	D
Formaldehyde	50-00-0	7.89E-05	lb/MMBtu	3.59E-04	1.57E-03	5.39E-05	D
Naphthalene	91-20-3	1.30E-04	lb/MMBtu	5.92E-04	2.59E-03	8.88E-05	D
Propylene		2.79E-03	lb/MMBtu	1.27E-02	5.57E-02	1.91E-03	D
Toluene	108-88-3	2.81E-04	lb/MMBtu	1.28E-03	5.61E-03	1.92E-04	D
Xylene (o,m,p)	1332-20-7	1.93E-04	lb/MMBtu	8.79E-04	3.85E-03	1.32E-04	D
Acenapthene	83-32-9	4.68E-06	lb/MMBtu	2.13E-05	9.34E-05	3.20E-06	D
Acenapthylene	203-96-8	9.23E-06	lb/MMBtu	4.20E-05	1.84E-04	6.31E-06	D
Anthracene	120-12-7	1.23E-06	lb/MMBtu	5.60E-06	2.45E-05	8.41E-07	D
Benz(a)anthracene	56-55-3	6.22E-07	lb/MMBtu	2.83E-06	1.24E-05	4.25E-07	D
Benzo(a)pyrene	50-32-8	2.57E-07	lb/MMBtu	1.17E-06	5.13E-06	1.76E-07	D
Benzo(b)fluoranthene	205-99-2	1.11E-06	lb/MMBtu	5.06E-06	2.21E-05	7.59E-07	D
Benzo(g,h,i)perylene	191-24-2	5.56E-07	lb/MMBtu	2.53E-06	1.11E-05	3.80E-07	D
Benzo(k)fluoranthene	205-82-3	2.18E-07	lb/MMBtu	9.93E-07	4.35E-06	1.49E-07	D
Chrysene	218-01-9	1.53E-06	lb/MMBtu	6.97E-06	3.05E-05	1.05E-06	D
Dibenzo(a,h)anthracene	53-70-3	3.46E-07	lb/MMBtu	1.58E-06	6.90E-06	2.36E-07	D
Fluoranthene	206-44-0	4.03E-06	lb/MMBtu	1.84E-05	8.04E-05	2.75E-06	D
Fluorene	86-73-7	1.28E-05	lb/MMBtu	5.83E-05	2.55E-04	8.75E-06	D
Indeno(1,2,3-cd)pyrene	193-39-5	4.14E-07	lb/MMBtu	1.89E-06	8.26E-06	2.83E-07	D
Phenanthrene	85-01-8	4.08E-05	lb/MMBtu	1.86E-04	8.14E-04	2.79E-05	D
Pyrene	129-00-0	3.71E-06	lb/MMBtu	1.69E-05	7.40E-05	2.54E-06	D
Polycyclic Organic Matter (POM)					1.63E-03	5.57E-05	
Max HAP					1.55E-02	5.30E-04	
Total HAP					3.07E-02	1.05E-03	

## NOTES

- A AP-42 Table 3.4-1  
 B Sulfur Content= 0.0015 % wt  
 C AP-42 Table 3.4-2  
 D AP-42 Table 3.4-3 and 3.4-4

TABLE A12 : EU06 EMISSION CALCULATIONS (FUEL OIL)

TABLE A12 : EU06 EMISSION CALCULATIONS (FUEL OIL)							
Parameter	Value	Units	Source				
Emission Unit	EU06		MPCA Emission Unit ID				
Make	Cummins		State operating permit application, November 1995				
Model	VT-1710-GS		State operating permit application, November 1995				
Maximum Output	685	bhp	State operating permit application, November 1995				
Fuel	No 2 Fuel Oil						
Maximum Fuel Input	32.54	gal/hr					
Unlimited Annual Operation	8760	hr/yr	Assumed because generator can participate in a peak shaving program				
Unlimited Annual Fuel Input	285,050	gal/yr	(Maximum Fuel Input) * (Unlimited Annual Operation)				
Annual Limit	300	hr/yr	Permit Limit				
Fuel Heat Value	0.14	MMBtu/gal	AP-42 Section 1.3				
Maximum Heat Input	4.56	MMBtu/hr	(Maximum Fuel Input) * (Fuel Heat Value)				
Criteria Pollutants							
Pollutant	CAS	Emission Factor		Unlimited Emission Rate (lb/hr)	Unlimited Emission Rate (tpy)	Limited Emission Rate (tpy)	NOTES
PM		0.0697	lb/MMBtu	0.318	1.39	0.05	C
PM10		0.0573	lb/MMBtu	0.261	1.14	0.04	C
PM2.5		0.0556	lb/MMBtu	0.253	1.11	0.04	C
SO2		0.00	lb/MMBtu	0.007	0.03	0.00	A, B
NOx		3.20	lb/MMBtu	14.578	63.85	2.19	A
VOC		0.09	lb/MMBtu	0.410	1.80	0.06	A
CO		0.85	lb/MMBtu	3.872	16.96	0.58	A
Greenhouse Gas (CO <sub>2</sub> e)		163.60	lb/MMBtu	745.301	3,264	112	G
CO2		163.1	lb/MMBtu	742.801	3,253	111	E
CH <sub>4</sub>		0.007	lb/MMBtu	0.030	0	0	F
N <sub>2</sub> O		0.001	lb/MMBtu	0.006	0	0	F
Organics							
Acetaldehyde	75-07-0	2.52E-05	lb/MMBtu	8.20E-07	3.59E-06	1.23E-07	D
Acrolein	107-02-8	7.88E-06	lb/MMBtu	2.56E-07	1.12E-06	3.85E-08	D
Benzene	71-43-2	7.76E-04	lb/MMBtu	3.54E-03	1.55E-02	5.30E-04	D
Formaldehyde	50-00-0	7.89E-05	lb/MMBtu	3.59E-04	1.57E-03	5.39E-05	D
Naphthalene	91-20-3	1.30E-04	lb/MMBtu	5.92E-04	2.59E-03	8.88E-05	D
Propylene		2.79E-03	lb/MMBtu	1.27E-02	5.57E-02	1.91E-03	D
Toluene	108-88-3	2.81E-04	lb/MMBtu	1.28E-03	5.61E-03	1.92E-04	D
Xylene (o,m,p)	1332-20-7	1.93E-04	lb/MMBtu	8.79E-04	3.85E-03	1.32E-04	D
Acenaphthene	83-32-9	4.68E-06	lb/MMBtu	2.13E-05	9.34E-05	3.20E-06	D
Acenaphthylene	203-96-8	9.23E-06	lb/MMBtu	4.20E-05	1.84E-04	6.31E-06	D
Anthracene	120-12-7	1.23E-06	lb/MMBtu	5.60E-06	2.45E-05	8.41E-07	D
Benz(a)anthracene	56-55-3	6.22E-07	lb/MMBtu	2.83E-06	1.24E-05	4.25E-07	D
Benzo(a)pyrene	50-32-8	2.57E-07	lb/MMBtu	1.17E-06	5.13E-06	1.76E-07	D
Benzo(b)fluoranthene	205-99-2	1.11E-06	lb/MMBtu	5.06E-06	2.21E-05	7.59E-07	D
Benzo(g,h,i)perylene	191-24-2	5.56E-07	lb/MMBtu	2.53E-06	1.11E-05	3.80E-07	D
Benzo(k)fluoranthene	205-82-3	2.18E-07	lb/MMBtu	9.93E-07	4.35E-06	1.49E-07	D
Chrysene	218-01-9	1.53E-06	lb/MMBtu	6.97E-06	3.05E-05	1.05E-06	D
Dibenzo(a,h)anthracene	53-70-3	3.46E-07	lb/MMBtu	1.58E-06	6.90E-06	2.36E-07	D
Fluoranthene	206-44-0	4.03E-06	lb/MMBtu	1.84E-05	8.04E-05	2.75E-06	D
Fluorene	86-73-7	1.28E-05	lb/MMBtu	5.83E-05	2.55E-04	8.75E-06	D
Indeno(1,2,3-cd)pyrene	193-39-5	4.14E-07	lb/MMBtu	1.89E-06	8.26E-06	2.83E-07	D
Phenanthrene	85-01-8	4.08E-05	lb/MMBtu	1.86E-04	8.14E-04	2.79E-05	D
Pyrene	129-00-0	3.71E-06	lb/MMBtu	1.69E-05	7.40E-05	2.54E-06	D
Polycyclic Organic Matter (POM)					1.63E-03	5.57E-05	
Max HAP					1.55E-02	5.30E-04	
Total HAP					3.07E-02	1.05E-03	

## NOTES

- A AP-42 Table 3.4-1  
 B Sulfur Content= 0.0015 % wt  
 C AP-42 Table 3.4-2  
 D AP-42 Table 3.4-3 and 3.4-4

TABLE A13 : EU07 EMISSION CALCULATIONS (FUEL OIL)

Parameter	Value	Units	Source				
Emission Unit	EU07		MPCA Emission Unit ID				
Make	Cummins		State operating permit application, November 1995				
Model	KTGA 19-G1		State operating permit application, November 1995				
Maximum Output	685	bhp	State operating permit application, November 1995				
Fuel	No 2 Fuel Oil						
Maximum Fuel Input	36.61	gal/hr					
Unlimited Annual Operation	8760	hr/yr	Assumed because generator can participate in a peak shaving program				
Unlimited Annual Fuel Input	320,704	gal/yr	(Maximum Fuel Input) * (Unlimited Annual Operation)				
Annual Limit	300	hr/yr	Permit Limit				
Fuel Heat Value	0.14	MMBtu/gal	AP-42 Section 1.3				
Maximum Heat Input	5.13	MMBtu/hr	(Maximum Fuel Input) * (Fuel Heat Value)				
Criteria Pollutants							
Pollutant	CAS	Emission Factor		Unlimited Emission Rate (lb/hr)	Unlimited Emission Rate (tpy)	Limited Emission Rate (tpy)	NOTES
PM		0.0697	lb/MMBtu	0.357	1.56	0.05	C
PM10		0.0573	lb/MMBtu	0.294	1.29	0.04	C
PM2.5		0.0556	lb/MMBtu	0.285	1.25	0.04	C
SO2		0.00	lb/MMBtu	0.008	0.03	0.00	A, B
NOx		3.20	lb/MMBtu	16.401	71.84	2.46	A
VOC		0.09	lb/MMBtu	0.461	2.02	0.07	A
CO		0.85	lb/MMBtu	4.357	19.08	0.65	A
Greenhouse Gas (CO <sub>2</sub> e)		163.60	lb/MMBtu	838.521	3,673	126	G
CO2		163.1	lb/MMBtu	835.708	3,660	125	E
CH <sub>4</sub>		0.007	lb/MMBtu	0.034	0	0	F
N <sub>2</sub> O		0.001	lb/MMBtu	0.007	0	0	F
Organics							
Acetaldehyde	75-07-0	2.52E-05	lb/MMBtu	9.23E-07	4.04E-06	1.38E-07	D
Acrolein	107-02-8	7.88E-06	lb/MMBtu	2.88E-07	1.26E-06	4.33E-08	D
Benzene	71-43-2	7.76E-04	lb/MMBtu	3.98E-03	1.74E-02	5.97E-04	D
Formaldehyde	50-00-0	7.89E-05	lb/MMBtu	4.04E-04	1.77E-03	6.07E-05	D
Naphthalene	91-20-3	1.30E-04	lb/MMBtu	6.66E-04	2.92E-03	9.99E-05	D
Propylene		2.79E-03	lb/MMBtu	1.43E-02	6.26E-02	2.14E-03	D
Toluene	108-88-3	2.81E-04	lb/MMBtu	1.44E-03	6.31E-03	2.16E-04	D
Xylene (o,m,p)	1332-20-7	1.93E-04	lb/MMBtu	9.89E-04	4.33E-03	1.48E-04	D
Acenaphthene	83-32-9	4.68E-06	lb/MMBtu	2.40E-05	1.05E-04	3.60E-06	D
Acenaphthylene	203-96-8	9.23E-06	lb/MMBtu	4.73E-05	2.07E-04	7.10E-06	D
Anthracene	120-12-7	1.23E-06	lb/MMBtu	6.30E-06	2.76E-05	9.46E-07	D
Benz(a)anthracene	56-55-3	6.22E-07	lb/MMBtu	3.19E-06	1.40E-05	4.78E-07	D
Benzo(a)pyrene	50-32-8	2.57E-07	lb/MMBtu	1.32E-06	5.77E-06	1.98E-07	D
Benzo(b)fluoranthene	205-99-2	1.11E-06	lb/MMBtu	5.69E-06	2.49E-05	8.53E-07	D
Benzo(g,h,i)perylene	191-24-2	5.56E-07	lb/MMBtu	2.85E-06	1.25E-05	4.27E-07	D
Benzo(k)fluoranthene	205-82-3	2.18E-07	lb/MMBtu	1.12E-06	4.89E-06	1.68E-07	D
Chrysene	218-01-9	1.53E-06	lb/MMBtu	7.84E-06	3.43E-05	1.18E-06	D
Dibenzo(a,h)anthracene	53-70-3	3.46E-07	lb/MMBtu	1.77E-06	7.77E-06	2.66E-07	D
Fluoranthene	206-44-0	4.03E-06	lb/MMBtu	2.07E-05	9.05E-05	3.10E-06	D
Fluorene	86-73-7	1.28E-05	lb/MMBtu	6.56E-05	2.87E-04	9.84E-06	D
Indeno(1,2,3-cd)pyrene	193-39-5	4.14E-07	lb/MMBtu	2.12E-06	9.29E-06	3.18E-07	D
Phenanthrene	85-01-8	4.08E-05	lb/MMBtu	2.09E-04	9.16E-04	3.14E-05	D
Pyrene	129-00-0	3.71E-06	lb/MMBtu	1.90E-05	8.33E-05	2.85E-06	D
Polycyclic Organic Matter (POM)					1.83E-03	6.27E-05	
Max HAP					1.74E-02	5.97E-04	
Total HAP					3.46E-02	1.18E-03	

## NOTES

- A AP-42 Table 3.4-1  
 B Sulfur Content= 0.0015 % wt  
 C AP-42 Table 3.4-2  
 D AP-42 Table 3.4-3 and 3.4-4

TABLE A14 : EU08 EMISSION CALCULATIONS (FUEL OIL)

TABLE A14 : EU08 EMISSION CALCULATIONS (FUEL OIL)							
Parameter	Value	Units	Source				
Emission Unit	EU08		MPCA Emission Unit ID				
Make	Onan		State operating permit application, November 1995				
Model	KTGA 19-G1		State operating permit application, November 1995				
Maximum Output	685	bhp	State operating permit application, November 1995				
Fuel	No 2 Fuel Oil						
Maximum Fuel Input	36.61	gal/hr					
Unlimited Annual Operation	8760	hr/yr	Assumed because generator can participate in a peak shaving program				
Unlimited Annual Fuel Input	320,704	gal/yr	(Maximum Fuel Input) * (Unlimited Annual Operation)				
Annual Limit	300	hr/yr	Permit Limit				
Fuel Heat Value	0.14	MMBtu/gal	AP-42 Section 1.3				
Maximum Heat Input	5.13	MMBtu/hr	(Maximum Fuel Input) * (Fuel Heat Value)				
Criteria Pollutants							
Pollutant	CAS	Emission Factor		Unlimited Emission Rate (lb/hr)	Unlimited Emission Rate (tpy)	Limited Emission Rate (tpy)	NOTES
PM		0.0697	lb/MMBtu	0.357	1.56	0.05	C
PM10		0.0573	lb/MMBtu	0.294	1.29	0.04	C
PM2.5		0.0556	lb/MMBtu	0.285	1.25	0.04	C
SO2		0.00	lb/MMBtu	0.008	0.03	0.00	A, B
NOx		3.20	lb/MMBtu	16.401	71.84	2.46	A
VOC		0.09	lb/MMBtu	0.461	2.02	0.07	A
CO		0.85	lb/MMBtu	4.357	19.08	0.65	A
Greenhouse Gas (CO <sub>2</sub> e)		163.60	lb/MMBtu	838.521	3,673	126	G
CO2		163.1	lb/MMBtu	835.708	3,660	125	E
CH <sub>4</sub>		0.007	lb/MMBtu	0.034	0	0	F
N <sub>2</sub> O		0.001	lb/MMBtu	0.007	0	0	F
Organics							
Acetaldehyde	75-07-0	2.52E-05	lb/MMBtu	9.23E-07	4.04E-06	1.38E-07	D
Acrolein	107-02-8	7.88E-06	lb/MMBtu	2.88E-07	1.26E-06	4.33E-08	D
Benzene	71-43-2	7.76E-04	lb/MMBtu	3.98E-03	1.74E-02	5.97E-04	D
Formaldehyde	50-00-0	7.89E-05	lb/MMBtu	4.04E-04	1.77E-03	6.07E-05	D
Naphthalene	91-20-3	1.30E-04	lb/MMBtu	6.66E-04	2.92E-03	9.99E-05	D
Propylene		2.79E-03	lb/MMBtu	1.43E-02	6.26E-02	2.14E-03	D
Toluene	108-88-3	2.81E-04	lb/MMBtu	1.44E-03	6.31E-03	2.16E-04	D
Xylene (o,m,p)	1332-20-7	1.93E-04	lb/MMBtu	9.89E-04	4.33E-03	1.48E-04	D
Acenaphthene	83-32-9	4.68E-06	lb/MMBtu	2.40E-05	1.05E-04	3.60E-06	D
Acenaphthylene	203-96-8	9.23E-06	lb/MMBtu	4.73E-05	2.07E-04	7.10E-06	D
Anthracene	120-12-7	1.23E-06	lb/MMBtu	6.30E-06	2.76E-05	9.46E-07	D
Benz(a)anthracene	56-55-3	6.22E-07	lb/MMBtu	3.19E-06	1.40E-05	4.78E-07	D
Benzo(a)pyrene	50-32-8	2.57E-07	lb/MMBtu	1.32E-06	5.77E-06	1.98E-07	D
Benzo(b)fluoranthene	205-99-2	1.11E-06	lb/MMBtu	5.69E-06	2.49E-05	8.53E-07	D
Benzo(g,h,i)perylene	191-24-2	5.56E-07	lb/MMBtu	2.85E-06	1.25E-05	4.27E-07	D
Benzo(k)fluoranthene	205-82-3	2.18E-07	lb/MMBtu	1.12E-06	4.89E-06	1.68E-07	D
Chrysene	218-01-9	1.53E-06	lb/MMBtu	7.84E-06	3.43E-05	1.18E-06	D
Dibenzo(a,h)anthracene	53-70-3	3.46E-07	lb/MMBtu	1.77E-06	7.77E-06	2.66E-07	D
Fluoranthene	206-44-0	4.03E-06	lb/MMBtu	2.07E-05	9.05E-05	3.10E-06	D
Fluorene	86-73-7	1.28E-05	lb/MMBtu	6.56E-05	2.87E-04	9.84E-06	D
Indeno(1,2,3-cd)pyrene	193-39-5	4.14E-07	lb/MMBtu	2.12E-06	9.29E-06	3.18E-07	D
Phenanthrene	85-01-8	4.08E-05	lb/MMBtu	2.09E-04	9.16E-04	3.14E-05	D
Pyrene	129-00-0	3.71E-06	lb/MMBtu	1.90E-05	8.33E-05	2.85E-06	D
Polycyclic Organic Matter (POM)					1.83E-03	6.27E-05	
Max HAP					1.74E-02	5.97E-04	
Total HAP					3.46E-02	1.18E-03	

## NOTES

- A AP-42 Table 3.4-1  
 B Sulfur Content= 0.0015 % wt  
 C AP-42 Table 3.4-2  
 D AP-42 Table 3.4-3 and 3.4-4

TABLE A15 : EU09 EMISSION CALCULATIONS (FUEL OIL)

TABLE A15 : EU09 EMISSION CALCULATIONS (FUEL OIL)							
Parameter	Value	Units	Source				
Emission Unit	EU09		MPCA Emission Unit ID				
Make	IC Engine 5		State operating permit application, November 1995				
Model	Onan		State operating permit application, November 1995				
Maximum Output	890	bhp	State operating permit application, November 1995				
Fuel	No 2 Fuel Oil						
Maximum Fuel Input	48.81	gal/hr					
Unlimited Annual Operation	8760	hr/yr	Assumed because generator can participate in a peak shaving program				
Unlimited Annual Fuel Input	427,576	gal/yr	(Maximum Fuel Input) * (Unlimited Annual Operation)				
Annual Limit	300	hr/yr	Permit Limit				
Fuel Heat Value	0.14	MMBtu/gal	AP-42 Section 1.3				
Maximum Heat Input	6.83	MMBtu/hr	(Maximum Fuel Input) * (Fuel Heat Value)				
Criteria Pollutants							
Pollutant	CAS	Emission Factor		Unlimited Emission Rate (lb/hr)	Unlimited Emission Rate (tpy)	Limited Emission Rate (tpy)	NOTES
PM		0.0697	lb/MMBtu	0.476	2.09	0.07	C
PM10		0.0573	lb/MMBtu	0.392	1.72	0.06	C
PM2.5		0.0556	lb/MMBtu	0.380	1.66	0.06	C
SO2		0.00	lb/MMBtu	0.010	0.05	0.00	A, B
NOx		3.20	lb/MMBtu	21.867	95.78	3.28	A
VOC		0.09	lb/MMBtu	0.615	2.69	0.09	A
CO		0.85	lb/MMBtu	5.808	25.44	0.87	A
Greenhouse Gas (CO2e)		163.60	lb/MMBtu	1,117.952	4,897	168	G
CO2		163.1	lb/MMBtu	1,114.201	4,880	167	E
CH4		0.007	lb/MMBtu	0.045	0	0	F
N2O		0.001	lb/MMBtu	0.009	0	0	F
Organics							
Acetaldehyde	75-07-0	2.52E-05	lb/MMBtu	1.23E-06	5.39E-06	1.85E-07	D
Acrolein	107-02-8	7.88E-06	lb/MMBtu	3.85E-07	1.68E-06	5.77E-08	D
Benzene	71-43-2	7.76E-04	lb/MMBtu	5.30E-03	2.32E-02	7.95E-04	D
Formaldehyde	50-00-0	7.89E-05	lb/MMBtu	5.39E-04	2.36E-03	8.09E-05	D
Naphthalene	91-20-3	1.30E-04	lb/MMBtu	8.88E-04	3.89E-03	1.33E-04	D
Propylene		2.79E-03	lb/MMBtu	1.91E-02	8.35E-02	2.86E-03	D
Toluene	108-88-3	2.81E-04	lb/MMBtu	1.92E-03	8.41E-03	2.88E-04	D
Xylene (o,m,p)	1332-20-7	1.93E-04	lb/MMBtu	1.32E-03	5.78E-03	1.98E-04	D
Acenaphthene	83-32-9	4.68E-06	lb/MMBtu	3.20E-05	1.40E-04	4.80E-06	D
Acenaphthylene	203-96-8	9.23E-06	lb/MMBtu	6.31E-05	2.76E-04	9.46E-06	D
Anthracene	120-12-7	1.23E-06	lb/MMBtu	8.41E-06	3.68E-05	1.26E-06	D
Benz(a)anthracene	56-55-3	6.22E-07	lb/MMBtu	4.25E-06	1.86E-05	6.38E-07	D
Benzo(a)pyrene	50-32-8	2.57E-07	lb/MMBtu	1.76E-06	7.69E-06	2.63E-07	D
Benzo(b)fluoranthene	205-99-2	1.11E-06	lb/MMBtu	7.59E-06	3.32E-05	1.14E-06	D
Benzo(g,h,i)perylene	191-24-2	5.56E-07	lb/MMBtu	3.80E-06	1.66E-05	5.70E-07	D
Benzo(k)fluoranthene	205-82-3	2.18E-07	lb/MMBtu	1.49E-06	6.52E-06	2.23E-07	D
Chrysene	218-01-9	1.53E-06	lb/MMBtu	1.05E-05	4.58E-05	1.57E-06	D
Dibenzo(a,h)anthracene	53-70-3	3.46E-07	lb/MMBtu	2.36E-06	1.04E-05	3.55E-07	D
Fluoranthene	206-44-0	4.03E-06	lb/MMBtu	2.75E-05	1.21E-04	4.13E-06	D
Fluorene	86-73-7	1.28E-05	lb/MMBtu	8.75E-05	3.83E-04	1.31E-05	D
Indeno(1,2,3-cd)pyrene	193-39-5	4.14E-07	lb/MMBtu	2.83E-06	1.24E-05	4.24E-07	D
Phenanthrene	85-01-8	4.08E-05	lb/MMBtu	2.79E-04	1.22E-03	4.18E-05	D
Pyrene	129-00-0	3.71E-06	lb/MMBtu	2.54E-05	1.11E-04	3.80E-06	D
Polycyclic Organic Matter (POM)					2.44E-03	8.36E-05	
Max HAP					2.32E-02	7.95E-04	
Total HAP					4.61E-02	1.58E-03	

## NOTES

- A AP-42 Table 3.4-1
- B Sulfur Content= 0.0015 % wt
- C AP-42 Table 3.4-2
- D AP-42 Table 3.4-3 and 3.4-4

TABLE A16 : EU10 EMISSION CALCULATIONS (FUEL OIL)

TABLE A16 : EU10 EMISSION CALCULATIONS (FUEL OIL)							
Parameter	Value	Units	Source				
Emission Unit	EU10		MPCA Emission Unit ID				
Make	Cummins		State operating permit application, November 1995				
Model	NT-855-GS		State operating permit application, November 1995				
Maximum Output	355	bhp	State operating permit application, November 1995				
Fuel	No 2 Fuel Oil						
Maximum Fuel Input	17.09	gal/hr					
Unlimited Annual Operation	500	hr/yr	Unlimited Operation for an emergency generator = 500 hours/yr				
Unlimited Annual Fuel Input	8,545	gal/yr	(Maximum Fuel Input) * (Unlimited Annual Operation)				
Annual Limit	300	hr/yr	Permit Limit				
Fuel Heat Value	0.14	MMBtu/gal	AP-42 Section 1.3				
Maximum Heat Input	2.39	MMBtu/hr	(Maximum Fuel Input) * (Fuel Heat Value)				
Criteria Pollutants							
Pollutant	CAS	Emission Factor		Unlimited Emission Rate (lb/hr)	Unlimited Emission Rate (tpy)	Limited Emission Rate (tpy)	NOTES
PM		0.3100	lb/MMBtu	0.742	0.19	0.11	C
PM10		0.3100	lb/MMBtu	0.742	0.19	0.11	C
PM2.5		0.3100	lb/MMBtu	0.742	0.19	0.11	C
SO2		0.002	lb/MMBtu	0.004	0.00	0.00	A, B
NOx		4.41	lb/MMBtu	10.551	2.64	1.58	C
VOC		0.35	lb/MMBtu	0.837	0.21	0.13	C
CO		0.95	lb/MMBtu	2.273	0.57	0.34	C
Greenhouse Gas (CO2e)		163.60	lb/MMBtu	391.432	98	59	G
CO2		163.1	lb/MMBtu	390.119	98	59	E
CH4		0.007	lb/MMBtu	0.016	0.004	0.002	F
N2O		0.001	lb/MMBtu	0.003	0.001	0.000	F
Organics							
Acetaldehyde	75-07-0	2.52E-05	lb/MMBtu	4.31E-07	1.08E-07	6.46E-08	D
Acrolein	107-02-8	7.88E-06	lb/MMBtu	1.35E-07	3.37E-08	2.02E-08	D
Benzene	71-43-2	7.76E-04	lb/MMBtu	1.86E-03	4.64E-04	2.78E-04	D
Formaldehyde	50-00-0	7.89E-05	lb/MMBtu	1.89E-04	4.72E-05	2.83E-05	D
Naphthalene	91-20-3	1.30E-04	lb/MMBtu	3.11E-04	7.78E-05	4.67E-05	D
Propylene		2.79E-03	lb/MMBtu	6.68E-03	1.67E-03	1.00E-03	D
Toluene	108-88-3	2.81E-04	lb/MMBtu	6.72E-04	1.68E-04	1.01E-04	D
Xylene (o,m,p)	1332-20-7	1.93E-04	lb/MMBtu	4.62E-04	1.15E-04	6.93E-05	D
Acenaphthene	83-32-9	4.68E-06	lb/MMBtu	1.12E-05	2.80E-06	1.68E-06	D
Acenaphthylene	203-96-8	9.23E-06	lb/MMBtu	2.21E-05	5.52E-06	3.31E-06	D
Anthracene	120-12-7	1.23E-06	lb/MMBtu	2.94E-06	7.36E-07	4.41E-07	D
Benz(a)anthracene	56-55-3	6.22E-07	lb/MMBtu	1.49E-06	3.72E-07	2.23E-07	D
Benzo(a)pyrene	50-32-8	2.57E-07	lb/MMBtu	6.15E-07	1.54E-07	9.22E-08	D
Benzo(b)fluoranthene	205-99-2	1.11E-06	lb/MMBtu	2.66E-06	6.64E-07	3.98E-07	D
Benzo(g,h,i)perylene	191-24-2	5.56E-07	lb/MMBtu	1.33E-06	3.33E-07	2.00E-07	D
Benzo(k)fluoranthene	205-82-3	2.18E-07	lb/MMBtu	5.22E-07	1.30E-07	7.82E-08	D
Chrysene	218-01-9	1.53E-06	lb/MMBtu	3.66E-06	9.15E-07	5.49E-07	D
Dibenzo(a,h)anthracene	53-70-3	3.46E-07	lb/MMBtu	8.28E-07	2.07E-07	1.24E-07	D
Fluoranthene	206-44-0	4.03E-06	lb/MMBtu	9.64E-06	2.41E-06	1.45E-06	D
Fluorene	86-73-7	1.28E-05	lb/MMBtu	3.06E-05	7.66E-06	4.59E-06	D
Indeno(1,2,3-cd)pyrene	193-39-5	4.14E-07	lb/MMBtu	9.91E-07	2.48E-07	1.49E-07	D
Phenanthrene	85-01-8	4.08E-05	lb/MMBtu	9.76E-05	2.44E-05	1.46E-05	D
Pyrene	129-00-0	3.71E-06	lb/MMBtu	8.88E-06	2.22E-06	1.33E-06	D
Polycyclic Organic Matter (POM)					4.88E-05	2.93E-05	
Max HAP					4.64E-04	2.78E-04	
Total HAP					9.21E-04	5.53E-04	

## NOTES

- A AP-42 Table 3.4-1
- B Sulfur Content= 0.0015 % wt
- C AP-42 Table 3.3-1
- D AP-42 Table 3.4-3 and 3.4-4
- E 40 CFR Part 98 Table C-1
- F 40 CFR Part 98 Table C-2
- G CO<sub>2</sub>e = (Global Warming Potential, GWP) \* (Emission). GWP from 40 CFR Part 98 Table A-1. CO<sub>2</sub> = 1, CH<sub>4</sub> = 21, N<sub>2</sub>O = 310

TABLE A17 : GP02 EMISSION CALCULATION SUMMARY

TABLE A17 : GP02 EMISSION CALCULATION SUMMARY								
Parameter	Value	Units	Source					
Emission Unit	GP002		MPCA Emission Unit ID					
Annual Operating Limit	300	hr/yr	Each Generator in GP002 (EU005-010)					
Criteria Pollutants								
Pollutant	CAS	EU005 Limited Emissions (tpy)	EU006 Limited Emissions (tpy)	EU007 Limited Emissions (tpy)	EU008 Limited Emissions (tpy)	EU009 Limited Emissions (tpy)	EU010 Limited Emissions (tpy)	GP002 Limited Emissions (tpy)
PM		0.05	0.05	0.05	0.05	0.07	0.11	0.39
PM10		0.04	0.04	0.04	0.04	0.06	0.11	0.34
PM2.5		0.04	0.04	0.04	0.04	0.06	0.11	0.33
SO2		0.00	0.00	0.00	0.00	0.00	0.00	0.01
NOx		2.19	2.19	2.46	2.46	3.28	1.58	14.16
VOC		0.06	0.06	0.07	0.07	0.09	0.13	0.48
CO		0.58	0.58	0.65	0.65	0.87	0.34	3.68
Greenhouse Gas (CO <sub>2</sub> e)		112	112	126	126	168	59	702
CO <sub>2</sub>		111	111	125	125	167	59	699
CH <sub>4</sub>		4.52E-03	4.52E-03	5.08E-03	5.08E-03	6.78E-03	2.37E-03	2.84E-02
N <sub>2</sub> O		9.04E-04	9.04E-04	1.02E-03	1.02E-03	1.36E-03	4.75E-04	5.67E-03
Organics								
Acetaldehyde	75-07-0	1.23E-07	1.23E-07	1.38E-07	1.38E-07	1.85E-07	6.46E-08	7.72E-07
Acrolein	107-02-8	3.85E-08	3.85E-08	4.33E-08	4.33E-08	5.77E-08	2.02E-08	2.41E-07
Benzene	71-43-2	5.30E-04	5.30E-04	5.97E-04	5.97E-04	7.95E-04	2.78E-04	3.33E-03
Formaldehyde	50-00-0	5.39E-05	5.39E-05	6.07E-05	6.07E-05	8.09E-05	2.83E-05	3.38E-04
Naphthalene	91-20-3	8.88E-05	8.88E-05	9.99E-05	9.99E-05	1.33E-04	4.67E-05	5.57E-04
Propylene		1.91E-03	1.91E-03	2.14E-03	2.14E-03	2.86E-03	1.00E-03	1.20E-02
Toluene	108-88-3	1.92E-04	1.92E-04	2.16E-04	2.16E-04	2.88E-04	1.01E-04	1.20E-03
Xylene (o,m,p)	1332-20-7	1.32E-04	1.32E-04	1.48E-04	1.48E-04	1.98E-04	6.93E-05	8.28E-04
Acenaphthene	83-32-9	3.20E-06	3.20E-06	3.60E-06	3.60E-06	4.80E-06	1.68E-06	2.01E-05
Acenaphthylene	203-96-8	6.31E-06	6.31E-06	7.10E-06	7.10E-06	9.46E-06	3.31E-06	3.96E-05
Anthracene	120-12-7	8.41E-07	8.41E-07	9.46E-07	9.46E-07	1.26E-06	4.41E-07	5.27E-06
Benz(a)anthracene	56-55-3	4.25E-07	4.25E-07	4.78E-07	4.78E-07	6.38E-07	2.23E-07	2.67E-06
Benzo(a)pyrene	50-32-8	1.76E-07	1.76E-07	1.98E-07	1.98E-07	2.63E-07	9.22E-08	1.10E-06
Benzo(b)fluoranthene	205-99-2	7.59E-07	7.59E-07	8.53E-07	8.53E-07	1.14E-06	3.98E-07	4.76E-06
Benzo(g,h,i)perylene	191-24-2	3.80E-07	3.80E-07	4.27E-07	4.27E-07	5.70E-07	2.00E-07	2.38E-06
Benzo(k)fluoranthene	205-82-3	1.49E-07	1.49E-07	1.68E-07	1.68E-07	2.23E-07	7.82E-08	9.35E-07
Chrysene	218-01-9	1.05E-06	1.05E-06	1.18E-06	1.18E-06	1.57E-06	5.49E-07	6.56E-06
Dibenzo(a,h)anthracene	53-70-3	2.36E-07	2.36E-07	2.66E-07	2.66E-07	3.55E-07	1.24E-07	1.48E-06
Fluoranthene	206-44-0	2.75E-06	2.75E-06	3.10E-06	3.10E-06	4.13E-06	1.45E-06	1.73E-05
Fluorene	86-73-7	8.75E-06	8.75E-06	9.84E-06	9.84E-06	1.31E-05	4.59E-06	5.49E-05
Indeno(1,2,3-cd)pyrene	193-39-5	2.83E-07	2.83E-07	3.18E-07	3.18E-07	4.24E-07	1.49E-07	1.78E-06
Phenanthrene	85-01-8	2.79E-05	2.79E-05	3.14E-05	3.14E-05	4.18E-05	1.46E-05	1.75E-04
Pyrene	129-00-0	2.54E-06	2.54E-06	2.85E-06	2.85E-06	3.80E-06	1.33E-06	1.59E-05
Polycyclic Organic Matter (POM)		5.57E-05	5.57E-05	6.27E-05	6.27E-05	8.36E-05	2.93E-05	3.50E-04
Max HAP								5.97E-04
Total HAP								1.18E-03

## NOTES

Please refer to Tables 11-16 for detailed calculations for each emission unit in GP002.



TABLE A18 : EU011-014 EMISSION CALCULATIONS (NATURAL GAS)									
Parameter	Value	Units	Source						
Emission Unit	EU011 - 014		MPCA Emission Unit ID						
Make	Cleaver Brooks		State operating permit application, November 1995						
Model	FLX-900		State operating permit application, November 1995						
Maximum Heat Input (per boiler)	8.742	MMBtu/hr	Per Boiler						
Fuel	Natural Gas								
Maximum Fuel Input (per boiler)	0.0086	MMSCF/hr	(Maximum Heat Input)/(Fuel Heat Value)						
Unlimited Annual Operation	8760	hr/yr	Number of hours in a year						
Unlimited Annual Fuel Input (per boiler)	75	MMSCF/yr	(Maximum Fuel Input) * (Unlimited Annual Operation)						
Annual Limit	none								
Fuel Heat Value	1020	btu/scf	AP-42 Section 1.4						
Number of Boilers	4								
Criteria Pollutants									
Pollutant	CAS	Emission Factor	Unlimited Emission Rate (lb/hr-boiler)	Unlimited Emission Rate (tpy per boiler)	Limited Emission Rate (tpy)	Unlimited Emission Rate Four Boilers (tpy)	Limited Emission Rate Four Boilers (tpy)	NOTES	
PM		7.60 lb/MMSCF	0.065	0.29	0.29	1.14	1.14	A	
PM10		7.60 lb/MMSCF	0.065	0.29	0.29	1.14	1.14	A	
PM2.5		7.60 lb/MMSCF	0.065	0.29	0.29	1.14	1.14	A	
SO <sub>2</sub>		0.60 lb/MMSCF	0.005	0.02	0.02	0.09	0.09	A	
NO <sub>x</sub>		100.00 lb/MMSCF	0.857	3.75	3.75	15.02	15.02	B	
VOC		5.50 lb/MMSCF	0.047	0.21	0.21	0.83	0.83	A	
CO		84.00 lb/MMSCF	0.720	3.15	3.15	12.61	12.61	B	
Greenhouse Gas (CO <sub>2</sub> e)			1,031	4,515	4,515	18,062	18,062	G	
CO <sub>2</sub>		120161 lb/MMSCF	1,030	4,511	4,511	18,044	18,044	E	
CH <sub>4</sub>		2.27E+00 lb/MMSCF	1.94E-02	8.51E-02	8.51E-02	3.40E-01	3.40E-01	F	
N <sub>2</sub> O		2.27E-01 lb/MMSCF	1.94E-03	8.51E-03	8.51E-03	3.40E-02	3.40E-02	F	
Organics									
Benzene	71-43-2	2.10E-03 lb/MMSCF	1.80E-05	7.88E-05	7.88E-05	3.15E-04	3.15E-04	C	
Butane	106-97-8	2.10E+00 lb/MMSCF	1.80E-02	7.88E-02	7.88E-02	3.15E-01	3.15E-01	C	
Dichlorobenzene	25321-22-6	1.20E-03 lb/MMSCF	1.03E-05	4.50E-05	4.50E-05	1.80E-04	1.80E-04	C	
Ethane	74-84-0	3.10E+00 lb/MMSCF	2.66E-02	1.16E-01	1.16E-01	4.66E-01	4.66E-01	C	
Formaldehyde	50-00-0	7.50E-02 lb/MMSCF	6.43E-04	2.82E-03	2.82E-03	1.13E-02	1.13E-02	C	
Hexane	110-54-3	1.80E+00 lb/MMSCF	1.54E-02	6.76E-02	6.76E-02	2.70E-01	2.70E-01	C	
Naphthalene	91-20-3	6.10E-04 lb/MMSCF	5.23E-06	2.29E-05	2.29E-05	9.16E-05	9.16E-05	C	
Pentane	109-66-0	2.60E+00 lb/MMSCF	2.23E-02	9.76E-02	9.76E-02	3.90E-01	3.90E-01	C	
Propane	74-98-6	1.60E+00 lb/MMSCF	1.37E-02	6.01E-02	6.01E-02	2.40E-01	2.40E-01	C	
Toluene	108-88-3	3.40E-03 lb/MMSCF	2.91E-05	1.28E-04	1.28E-04	5.11E-04	5.11E-04	C	
Acenaphthene	83-32-9	1.80E-06 lb/MMSCF	1.54E-08	6.76E-08	6.76E-08	2.70E-07	2.70E-07	C	
Acenaphthylene	203-96-8	1.80E-06 lb/MMSCF	1.54E-08	6.76E-08	6.76E-08	2.70E-07	2.70E-07	C	
Anthracene	120-12-7	2.40E-06 lb/MMSCF	2.06E-08	9.01E-08	9.01E-08	3.60E-07	3.60E-07	C	
Benzo(a)anthracene	56-55-3	1.80E-06 lb/MMSCF	1.54E-08	6.76E-08	6.76E-08	2.70E-07	2.70E-07	C	
Benzo(a)pyrene	50-32-8	1.20E-06 lb/MMSCF	1.03E-08	4.50E-08	4.50E-08	1.80E-07	1.80E-07	C	
Benzo(b)fluoranthene	205-99-2	1.80E-06 lb/MMSCF	1.54E-08	6.76E-08	6.76E-08	2.70E-07	2.70E-07	C	
Benzo(g,h,i)perylene	191-24-2	1.20E-06 lb/MMSCF	1.03E-08	4.50E-08	4.50E-08	1.80E-07	1.80E-07	C	
Benzo(k)fluoranthene	205-82-3	1.80E-06 lb/MMSCF	1.54E-08	6.76E-08	6.76E-08	2.70E-07	2.70E-07	C	
Chrysene	218-01-9	1.80E-06 lb/MMSCF	1.54E-08	6.76E-08	6.76E-08	2.70E-07	2.70E-07	C	
Dibenzo(a,h)anthracene	53-70-3	1.20E-06 lb/MMSCF	1.03E-08	4.50E-08	4.50E-08	1.80E-07	1.80E-07	C	
7,12-Dimethylbenz(a)anthracene	57-97-6	1.60E-05 lb/MMSCF	1.37E-07	6.01E-07	6.01E-07	2.40E-06	2.40E-06	C	
Fluoranthene	206-44-0	3.00E-06 lb/MMSCF	2.57E-08	1.13E-07	1.13E-07	4.50E-07	4.50E-07	C	
Fluorene	86-73-7	2.80E-06 lb/MMSCF	2.40E-08	1.05E-07	1.05E-07	4.20E-07	4.20E-07	C	
Indeno(1,2,3-cd)pyrene	193-39-5	1.80E-06 lb/MMSCF	1.54E-08	6.76E-08	6.76E-08	2.70E-07	2.70E-07	C	
2-Methylnaphthalene	91-57-6	2.40E-05 lb/MMSCF	2.06E-07	9.01E-07	9.01E-07	3.60E-06	3.60E-06	C	
3-Methylchloranthrene	56-49-5	1.80E-06 lb/MMSCF	1.54E-08	6.76E-08	6.76E-08	2.70E-07	2.70E-07	C	
Phenanthrene	85-01-8	1.70E-05 lb/MMSCF	1.46E-07	6.38E-07	6.38E-07	2.55E-06	2.55E-06	C	
Pyrene	129-00-0	5.00E-05 lb/MMSCF	4.29E-07	1.88E-06	1.88E-06	7.51E-06	7.51E-06	C	
Polycyclic Organic Matter (POM)				5.00E-06	5.00E-06	2.00E-05	2.00E-05		
Metals									
Arsenic	7440-38-2	2.00E-04 lb/MMSCF	1.71E-06	7.51E-06	7.51E-06	3.00E-05	3.00E-05	D	
Barium	7440-39-3	4.40E-03 lb/MMSCF	3.77E-05	1.65E-04	1.65E-04	6.61E-04	6.61E-04	D	
Beryllium	7440-41-7	1.20E-05 lb/MMSCF	1.03E-07	4.50E-07	4.50E-07	1.80E-06	1.80E-06	D	
Cadmium	7440-43-9	1.10E-03 lb/MMSCF	9.43E-06	4.13E-05	4.13E-05	1.65E-04	1.65E-04	D	
Chromium	7440-47-3	1.40E-03 lb/MMSCF	1.20E-05	5.26E-05	5.26E-05	2.10E-04	2.10E-04	D	
Cobalt	7440-48-4	8.40E-05 lb/MMSCF	7.20E-07	3.15E-06	3.15E-06	1.26E-05	1.26E-05	D	
Copper	7440-50-8	8.50E-04 lb/MMSCF	7.29E-06	3.19E-05	3.19E-05	1.28E-04	1.28E-04	D	
Lead	7139-92-1	5.00E-04 lb/MMSCF	4.29E-06	1.88E-05	1.88E-05	7.51E-05	7.51E-05	D	
Manganese	7439-96-5	3.80E-04 lb/MMSCF	3.26E-06	1.43E-05	1.43E-05	5.71E-05	5.71E-05	D	
Mercury	7439-97-6	2.60E-04 lb/MMSCF	2.23E-06	9.76E-06	9.76E-06	3.90E-05	3.90E-05	D	
Molybdenum	7439-98-7	1.10E-03 lb/MMSCF	9.43E-06	4.13E-05	4.13E-05	1.65E-04	1.65E-04	D	
Nickel	7440-02-0	2.10E-03 lb/MMSCF	1.80E-05	7.88E-05	7.88E-05	3.15E-04	3.15E-04	D	
Selenium	7782-49-2	2.40E-05 lb/MMSCF	2.06E-07	9.01E-07	9.01E-07	3.60E-06	3.60E-06	D	
Vanadium	7440-62-2	2.30E-03 lb/MMSCF	1.97E-05	8.63E-05	8.63E-05	3.45E-04	3.45E-04	D	
Zinc	7440-66-6	2.90E-02 lb/MMSCF	2.49E-04	1.09E-03	1.09E-03	4.35E-03	4.35E-03	D	
Max HAP				6.76E-02	6.76E-02	2.70E-01	2.70E-01		
Total HAP				7.09E-02	7.09E-02	2.84E-01	2.84E-01		

## NOTES

A

AP-42 Table 1.4-2

B

AP-42 Table 1.4-1

C

AP-42 Table 1.4-3

D

AP-42 Table 1.4-4

E

40 CFR Part 98 Table C-1: Pipeline natural gas = 1028 btu/scf, CO<sub>2</sub> emission = 53.02 kg CO<sub>2</sub>/mmBtu = 120162 lb/MMscf

F

40 CFR Part 98 Table C-2: Pipeline natural gas = 1028 btu/scf, CH<sub>4</sub> = 0.001 kg CH<sub>4</sub>/mmBtu, N<sub>2</sub>O = 0.0001 kg N<sub>2</sub>O / mmBtu

G

CO<sub>2</sub>e = (Global Warming Potential, GWP) \* (Emission). GWP from 40 CFR Part 98 Table A-1. CO<sub>2</sub> = 1, CH<sub>4</sub> = 21, N<sub>2</sub>O = 310



TABLE A19 : EU11-14 EMISSION CALCULATIONS (FUEL OIL)

TABLE A19 : EU11-14 EMISSION CALCULATIONS (FUEL OIL)									
Parameter	Value	Units	Source						
Emission Unit	EU011 - 014		MPCA Emission Unit ID						
Make	Cleaver Brooks		State operating permit application, November 1995						
Model	FLX-900		State operating permit application, November 1995						
Maximum Heat Input (per boiler)	8.742	MMBtu/hr	State operating permit application, November 1995						
Fuel	Fuel Oil								
Maximum Fuel Input (per boiler)	64.0	gal/hr	(Maximum Heat Input)/(Fuel Heat Value)						
Unlimited Annual Operation	8760	hr/yr	Number of hours in a year						
Unlimited Annual Fuel Input (per boiler)	560,640	gal/yr	(Maximum Fuel Input) * (Unlimited Annual Operation)						
Annual Limit	137,000	gal/yr	Permit limit for EU011-014						
Fuel Heat Value	0.14	MMBtu/gal	AP-42 Section 1.4						
Number of Boilers	4								
Criteria Pollutants									
Pollutant	CAS	Emission Factor	Unlimited Emission Rate (lb/hr-boiler)	Unlimited Emission Rate (tpy per boiler)	Limited Emission Rate (tpy)	Unlimited Emission Rate Four Boilers (tpy)	Limited Emission Rate Four Boilers (tpy)	NOTES	
PM		3.30 lb/1000 gal	0.211	0.93	0.23	3.70	0.23	A	
PM10		2.30 lb/1000 gal	0.147	0.64	0.16	2.58	0.16	B	
PM2.5		1.55 lb/1000 gal	0.099	0.43	0.11	1.74	0.11	B	
SO2		0.21 lb/1000 gal	0.014	0.06	0.01	0.24	0.01	A, C	
NOx		20.00 lb/1000 gal	1.280	5.61	1.37	22.43	1.37	A	
VOC		0.56 lb/1000 gal	0.036	0.16	0.04	0.62	0.04	A	
CO		5.00 lb/1000 gal	0.320	1.40	0.34	5.61	0.34	A	
Greenhouse Gas (CO2e)			1,445	6,329	1,547	25,315	1,547	J	
CO2		22501 lb/1000 gal	1,440	6,308	1,541	25,230	1,541	H	
CH4		9.13E-01 lb/1000 gal	0	2.56E-01	6.25E-02	1.02E+00	6.25E-02	I	
N2O		1.83E-01 lb/1000 gal	0	5.12E-02	1.25E-02	2.05E-01	1.25E-02	I	
Organics									
Benzene	71-43-2	2.14E-04 lb/1000 gal	1.37E-05	6.00E-05	1.47E-05	2.40E-04	1.47E-05	D	
Ethylbenzene	100-41-4	6.36E-05 lb/1000 gal	4.07E-06	1.78E-05	4.36E-06	7.13E-05	4.36E-06	D	
Formaldehyde	50-00-0	3.30E-02 lb/1000 gal	2.11E-03	9.25E-03	2.26E-03	3.70E-02	2.26E-03	D	
Naphthalene	91-20-3	1.13E-03 lb/1000 gal	7.23E-05	3.17E-04	7.74E-05	1.27E-03	7.74E-05	D	
1,1,1-Trichloroethane	71-55-6	2.36E-04 lb/1000 gal	1.51E-05	6.62E-05	1.62E-05	2.65E-04	1.62E-05	D	
Toluene	108-88-3	6.20E-03 lb/1000 gal	3.97E-04	1.74E-03	4.25E-04	6.95E-03	4.25E-04	D	
Xylene (o,m,p)	1332-20-7	1.09E-04 lb/1000 gal	6.98E-06	3.06E-05	7.47E-06	1.22E-04	7.47E-06	D	
Acenaphthene	83-32-9	2.11E-05 lb/1000 gal	1.35E-06	5.91E-06	1.45E-06	2.37E-05	1.45E-06	D, F	
Acenaphthylene	203-96-8	2.53E-07 lb/1000 gal	1.62E-08	7.09E-08	1.73E-08	2.84E-07	1.73E-08	D, F	
Anthracene	120-12-7	1.22E-06 lb/1000 gal	7.81E-08	3.42E-07	8.36E-08	1.37E-06	8.36E-08	D, F	
Benz(a)anthracene	56-55-3	4.01E-06 lb/1000 gal	2.57E-07	1.12E-06	2.75E-07	4.50E-06	2.75E-07	D, F	
Benzo(b,k)fluoranthene	205-99-2	1.48E-06 lb/1000 gal	9.47E-08	4.15E-07	1.01E-07	1.66E-06	1.01E-07	D, F	
Benzo(g,h,i)perylene	191-24-2	2.26E-06 lb/1000 gal	1.45E-07	6.34E-07	1.55E-07	2.53E-06	1.55E-07	D, F	
Chrysene	218-01-9	2.38E-06 lb/1000 gal	1.52E-07	6.67E-07	1.63E-07	2.67E-06	1.63E-07	D, F	
Dibenzo(a,h)anthracene	53-70-3	1.67E-06 lb/1000 gal	1.07E-07	4.68E-07	1.14E-07	1.87E-06	1.14E-07	D, F	
Fluoranthene	206-44-0	4.84E-06 lb/1000 gal	3.10E-07	1.36E-06	3.32E-07	5.43E-06	3.32E-07	D, F	
Fluorene	86-73-7	4.47E-06 lb/1000 gal	2.86E-07	1.25E-06	3.06E-07	5.01E-06	3.06E-07	D, F	
Indeno(1,2,3-cd)pyrene	193-39-5	2.14E-06 lb/1000 gal	1.37E-07	6.00E-07	1.47E-07	2.40E-06	1.47E-07	D, F	
Phenanthrene	85-01-8	1.05E-05 lb/1000 gal	6.72E-07	2.94E-06	7.19E-07	1.18E-05	7.19E-07	D, F	
Pyrene	129-00-0	4.25E-06 lb/1000 gal	2.72E-07	1.19E-06	2.91E-07	4.77E-06	2.91E-07	D, F	
OCDD	3268-87-9	3.10E-09 lb/1000 gal	1.98E-10	8.69E-10	2.12E-10	3.48E-09	2.12E-10	D, F	
Polycyclic Organic Matter (POM)				1.70E-05	4.15E-06	6.79E-05	4.15E-06		
Metals									
Arsenic	7440-38-2	5.60E-04 lb/1000 gal	3.58E-05	1.57E-04	3.84E-05	6.28E-04	3.84E-05	E	
Beryllium	7440-41-7	4.20E-04 lb/1000 gal	2.69E-05	1.18E-04	2.88E-05	4.71E-04	2.88E-05	E	
Cadmium	7440-43-9	4.20E-04 lb/1000 gal	2.69E-05	1.18E-04	2.88E-05	4.71E-04	2.88E-05	E	
Chromium	7440-47-3	4.20E-04 lb/1000 gal	2.69E-05	1.18E-04	2.88E-05	4.71E-04	2.88E-05	E	
Copper	7440-50-8	8.40E-04 lb/1000 gal	5.38E-05	2.35E-04	5.75E-05	9.42E-04	5.75E-05	E	
Lead	7139-92-1	1.26E-03 lb/1000 gal	8.06E-05	3.53E-04	8.63E-05	1.41E-03	8.63E-05	E	
Manganese	7439-96-5	8.40E-04 lb/1000 gal	5.38E-05	2.35E-04	5.75E-05	9.42E-04	5.75E-05	E	
Mercury	7439-97-6	4.20E-04 lb/1000 gal	2.69E-05	1.18E-04	2.88E-05	4.71E-04	2.88E-05	E	
Nickel	7440-02-0	4.20E-04 lb/1000 gal	2.69E-05	1.18E-04	2.88E-05	4.71E-04	2.88E-05	E	
Selenium	7782-49-2	2.10E-03 lb/1000 gal	1.34E-04	5.89E-04	1.44E-04	2.35E-03	1.44E-04	E	
Zinc	7440-66-6	5.60E-04 lb/1000 gal	3.58E-05	1.57E-04	3.84E-05	6.28E-04	3.84E-05	E	
Max HAP				9.25E-03	2.26E-03	3.70E-02	9.04E-03		
Total HAP				1.34E-02	3.28E-03	5.37E-02	1.31E-02		

## NOTES

- A AP-42 Table 1.3-1, 9/98
- B AP-42 Table 1.3-6, 9/98
- C Sulfur Content= 0.0015 % wt
- D AP-42 Table 1.3-9, 9/98
- E AP-42 Table 1.3-11, 9/98
- F This compound is considered polycyclic organic matter (POM)
- G AP-42 Table 1.3-12, 9/98
- H 40 CFR Part 98 Table C-1: Pipeline natural gas = 0.138 btu/gal, CO<sub>2</sub> emission = 73.96 kg CO<sub>2</sub>/mmBtu = 22,501 lb/1000 gal
- I 40 CFR Part 98 Table C-2: Pipeline natural gas = 0.138 btu/gal, CH<sub>4</sub> = 0.003 kg CH<sub>4</sub>/mmBtu, N<sub>2</sub>O = 0.0006 kg N<sub>2</sub>O / mmBtu
- J CO<sub>2</sub>e = (Global Warming Potential, GWP) \* (Emission). GWP from 40 CFR Part 98 Table A-1. CO<sub>2</sub> = 1, CH<sub>4</sub> = 21, N<sub>2</sub>O = 310

TABLE A20 : GP003 EMISSION CALCULATION SUMMARY					
Parameter	Value	Units	Source		
Emission Unit	GP003		MPCA Emission Unit ID		
Annual Operating Limit	137,000	gal/yr	Fuel Oil (no limit on natural gas)		
Hours of operation to reach Fuel Oil Limit	2141	hours	Hours for one boiler to reach annual fuel oil limit.		
Capacity factor for NG Emissions	0.939		1 - (Capacity factor for FO Emissions)		
Capacity factor for FO Emissions	0.061		(2141 hrs) / 4 /8760. This is the annual capacity factor if all four boilers operate on fuel oil assuming simultaneous operation at full load to reach the annual fuel oil limit. This factor is multiplied by the unlimited emissions to obtain the emissions from GP003 on fuel oil.		
Criteria Pollutants					
Pollutant	CAS	EU011-014 Limited Emissions from Natural Gas Combustion (tpy)	EU011-014 Limited Emissions from Fuel Oil Combustion (tpy)	GP003 Limited Emissions (tpy)	NOTES
PM		1.07	0.23	1.30	A
PM10		1.07	0.16	1.23	B
PM2.5		1.07	0.11	1.18	B
SO2		0.08	0.01	0.10	A
NOx		14.10	1.37	15.47	A
VOC		0.78	0.04	0.83	B
CO		11.84	0.34	12.61	B
Greenhouse Gas (CO2e)		16,958	1,547	18,505	A
CO2		16941	1541	18483	A
CH4		3.20E-01	6.25E-02	3.82E-01	A
N2O		3.20E-02	1.25E-02	4.45E-02	A
Organics					
Benzene	71-43-2	2.96E-04	1.47E-05	3.15E-04	
Butane	106-97-8	2.96E-01	0.00E+00	3.15E-01	
Dichlorobenzene	25321-22-6	1.69E-04	0.00E+00	1.80E-04	
Ethylbenzene	100-41-4	0.00E+00	4.36E-06	4.36E-06	
Ethane	74-84-0	4.37E-01	0.00E+00	4.66E-01	
Formaldehyde	50-00-0	1.06E-02	2.26E-03	1.28E-02	
Hexane	110-54-3	2.54E-01	0.00E+00	2.70E-01	
Naphthalene	91-20-3	8.60E-05	7.74E-05	1.63E-04	
Pentane	109-66-0	3.67E-01	0.00E+00	3.90E-01	
Propane	74-98-6	2.26E-01	0.00E+00	2.40E-01	
1,1,1-Trichloroethane	71-55-6	0.00E+00	1.62E-05	1.62E-05	
Toluene	108-88-3	4.79E-04	4.25E-04	9.04E-04	
Xylene (o,m,p)	1332-20-7	0.00E+00	7.47E-06	7.47E-06	
Acenaphthene	83-32-9	2.54E-07	1.45E-06	1.70E-06	
Acenaphthylene	203-96-8	2.54E-07	1.73E-08	2.71E-07	
Anthracene	120-12-7	3.38E-07	8.36E-08	4.22E-07	
Benzo(a)anthracene	56-55-3	2.54E-07	2.75E-07	5.28E-07	
Benzo(a)pyrene	50-32-8	1.69E-07	0.00E+00	1.80E-07	
Benzo(b)fluoranthene	205-99-2	2.54E-07	0.00E+00	2.70E-07	
Benzo(b,k)fluoranthene	205-99-2	0.00E+00	1.01E-07	1.01E-07	
Benzo(g,h,i)perylene	191-24-2	1.69E-07	1.55E-07	3.24E-07	
Benzo(k)fluoranthene	205-82-3	2.54E-07	0.00E+00	2.70E-07	
Chrysene	218-01-9	2.54E-07	1.63E-07	4.17E-07	
Dibenzo(a,h)anthracene	53-70-3	1.69E-07	1.14E-07	2.84E-07	
7,12-Dimethylbenz(a)anthracene	57-97-6	2.26E-06	0.00E+00	2.40E-06	
Fluoranthene	206-44-0	4.23E-07	3.32E-07	7.55E-07	
Fluorene	86-73-7	3.95E-07	3.06E-07	7.01E-07	
Indeno(1,2,3-cd)pyrene	193-39-5	2.54E-07	1.47E-07	4.00E-07	
2-Methylnaphthalene	91-57-6	3.38E-06	0.00E+00	3.60E-06	
3-Methylchloranthrene	56-49-5	2.54E-07	0.00E+00	2.70E-07	
Phenanthrene	85-01-8	2.40E-06	7.19E-07	3.12E-06	
Pyrene	129-00-0	7.05E-06	2.91E-07	7.51E-06	
OCDD	3268-87-9	0.00E+00	2.12E-10	2.12E-10	
Polycyclic Organic Matter (POM)		1.88E-05	4.15E-06	2.29E-05	
Metals					
Antimony	7440-36-0	0.00E+00	0.00E+00	0.00E+00	
Arsenic	7440-38-2	2.82E-05	3.84E-05	6.66E-05	
Barium	7440-39-3	6.20E-04	0.00E+00	6.61E-04	
Beryllium	7440-41-7	1.69E-06	2.88E-05	3.05E-05	
Cadmium	7440-43-9	1.55E-04	2.88E-05	1.84E-04	
Chloride		0.00E+00	0.00E+00	0.00E+00	
Chromium	7440-47-3	1.97E-04	2.88E-05	2.26E-04	
Chromium (VI)	18540-29-9	0.00E+00	0.00E+00	0.00E+00	
Cobalt	7440-48-4	1.18E-05	0.00E+00	1.26E-05	
Copper	7440-50-8	1.20E-04	5.75E-05	1.77E-04	
Fluoride	16984-48-8	0.00E+00	0.00E+00	0.00E+00	
Lead	7139-92-1	7.05E-05	8.63E-05	1.57E-04	
Manganese	7439-96-5	5.36E-05	5.75E-05	1.11E-04	
Mercury	7439-97-6	3.67E-05	2.88E-05	6.54E-05	
Molybdenum	7439-98-7	1.55E-04	0.00E+00	1.65E-04	
Nickel	7440-02-0	2.96E-04	2.88E-05	3.25E-04	
Phosphorus	7723-14-0	0.00E+00	0.00E+00	0.00E+00	
Selenium	7782-49-2	3.38E-06	1.44E-04	1.47E-04	
Vanadium	7440-62-2	3.24E-04	0.00E+00	3.45E-04	
Zinc	7440-66-6	4.09E-03	3.84E-05	4.35E-03	
Max HAP		2.54E-01	0.0022605	2.70E-01	
Total HAP		2.66E-01	0.003279313	2.84E-01	

## NOTES

A Worst case emissions occur from combustion of fuel oil up to permit limit, then combusting natural gas the remainder of the year.

B Worst case emissions occur from combustion of natural gas all year.

Please refer to Tables 18-19 for detailed calculations for each emission unit in GP003.

TABLE A21 : EU15 EMISSION CALCULATIONS (FUEL OIL)							
Parameter	Value	Units	Source				
Emission Unit	EU15		MPCA Emission Unit ID				
Make	Cummins		State operating permit application, November 1995				
Model	QST30-G1		State operating permit application, November 1995				
Maximum Output	1135	bhp	State operating permit application, November 1995				
Fuel	No 2 Fuel Oil						
Maximum Fuel Input	44.50	gal/hr					
Unlimited Annual Operation	8760	hr/yr					
Unlimited Annual Fuel Input	389,820	gal/yr	(Maximum Fuel Input) * (Unlimited Annual Operation)				
Annual Limit	300	hr/yr	Permit Limit				
Fuel Heat Value	0.14	MMBtu/gal	AP-42 Section 1.3				
Maximum Heat Input	6.23	MMBtu/hr	(Maximum Fuel Input) * (Fuel Heat Value)				
Criteria Pollutants							
Pollutant	CAS	Emission Factor		Unlimited Emission Rate (lb/hr)	Unlimited Emission Rate (tpy)	Limited Emission Rate (tpy)	NOTES
PM		0.0697	lb/MMBtu	0.434	1.90	0.07	C
PM10		0.0573	lb/MMBtu	0.357	1.56	0.05	C
PM2.5		0.0556	lb/MMBtu	0.346	1.52	0.05	C
SO2		0.0015	lb/MMBtu	0.009	0.04	0.001	A, B
NOx		3.20	lb/MMBtu	19.936	87.32	2.99	A
VOC		0.09	lb/MMBtu	0.561	2.46	0.08	A
CO		0.85	lb/MMBtu	5.296	23.19	0.79	A
Greenhouse Gas (CO <sub>2</sub> e)		163.60	lb/MMBtu	1,019.235	4,464	153	G
CO2		163.1	lb/MMBtu	1,015.815	4,449	152	E
CH <sub>4</sub>		0.007	lb/MMBtu	0.041	0	0	F
N <sub>2</sub> O		0.001	lb/MMBtu	0.008	0	0	F
Organics							
Acetaldehyde	75-07-0	2.52E-05	lb/MMBtu	1.12E-06	4.91E-06	1.68E-07	D
Acrolein	107-02-8	7.88E-06	lb/MMBtu	3.51E-07	1.54E-06	5.26E-08	D
Benzene	71-43-2	7.76E-04	lb/MMBtu	4.83E-03	2.12E-02	7.25E-04	D
Formaldehyde	50-00-0	7.89E-05	lb/MMBtu	4.92E-04	2.15E-03	7.37E-05	D
Naphthalene	91-20-3	1.30E-04	lb/MMBtu	8.10E-04	3.55E-03	1.21E-04	D
Propylene		2.79E-03	lb/MMBtu	1.74E-02	7.61E-02	2.61E-03	D
Toluene	108-88-3	2.81E-04	lb/MMBtu	1.75E-03	7.67E-03	2.63E-04	D
Xylene (o,m,p)	1332-20-7	1.93E-04	lb/MMBtu	1.20E-03	5.27E-03	1.80E-04	D
Acenaphthene	83-32-9	4.68E-06	lb/MMBtu	2.92E-05	1.28E-04	4.37E-06	D
Acenaphthylene	203-96-8	9.23E-06	lb/MMBtu	5.75E-05	2.52E-04	8.63E-06	D
Anthracene	120-12-7	1.23E-06	lb/MMBtu	7.66E-06	3.36E-05	1.15E-06	D
Benz(a)anthracene	56-55-3	6.22E-07	lb/MMBtu	3.88E-06	1.70E-05	5.81E-07	D
Benzo(a)pyrene	50-32-8	2.57E-07	lb/MMBtu	1.60E-06	7.01E-06	2.40E-07	D
Benzo(b)fluoranthene	205-99-2	1.11E-06	lb/MMBtu	6.92E-06	3.03E-05	1.04E-06	D
Benzo(g,h,i)perylene	191-24-2	5.56E-07	lb/MMBtu	3.46E-06	1.52E-05	5.20E-07	D
Benzo(k)fluoranthene	205-82-3	2.18E-07	lb/MMBtu	1.36E-06	5.95E-06	2.04E-07	D
Chrysene	218-01-9	1.53E-06	lb/MMBtu	9.53E-06	4.17E-05	1.43E-06	D
Dibenzo(a,h)anthracene	53-70-3	3.46E-07	lb/MMBtu	2.16E-06	9.44E-06	3.23E-07	D
Fluoranthene	206-44-0	4.03E-06	lb/MMBtu	2.51E-05	1.10E-04	3.77E-06	D
Fluorene	86-73-7	1.28E-05	lb/MMBtu	7.97E-05	3.49E-04	1.20E-05	D
Indeno(1,2,3-cd)pyrene	193-39-5	4.14E-07	lb/MMBtu	2.58E-06	1.13E-05	3.87E-07	D
Phenanthrene	85-01-8	4.08E-05	lb/MMBtu	2.54E-04	1.11E-03	3.81E-05	D
Pyrene	129-00-0	3.71E-06	lb/MMBtu	2.31E-05	1.01E-04	3.47E-06	D
Polycyclic Organic Matter (POM)					2.22E-03	7.62E-05	
Max HAP					2.12E-02	7.25E-04	
Total HAP					4.20E-02	1.44E-03	

## NOTES

- A AP-42 Table 3.4-1
- B Sulfur Content= 0.0015 % wt
- C AP-42 Table 3.4-2
- D AP-42 Table 3.4-3 and 3.4-4
- E 40 CFR Part 98 Table C-1: Pipeline natural gas = 1028 btu/scf, CO2 emission = 53.02 kg CO2/mmBtu = 120162 lb/MMscf
- F 40 CFR Part 98 Table C-2: Pipeline natural gas = 1028 btu/scf, CH4 = 0.001 kg CH4/mmBtu, N2O = 0.0001 kg N2O / mmBtu
- G CO2e = (Global Warming Potential, GWP) \* (Emission). GWP from 40 CFR Part 98 Table A-1. CO<sub>2</sub> = 1, CH<sub>4</sub> = 21, N<sub>2</sub>O = 310

TABLE A22 : EU16 EMISSION CALCULATIONS (FUEL OIL)							
Parameter	Value	Units	Source				
Emission Unit	EU16		MPCA Emission Unit ID				
Make	Cummins		State operating permit application, November 1995				
Model	QST30-G1		State operating permit application, November 1995				
Maximum Output	1135	bhp	State operating permit application, November 1995				
Fuel	No 2 Fuel Oil						
Maximum Fuel Input	44.50	gal/hr					
Unlimited Annual Operation	8760	hr/yr					
Unlimited Annual Fuel Input	389,820	gal/yr	(Maximum Fuel Input) * (Unlimited Annual Operation)				
Annual Limit	300	hr/yr	Permit Limit				
Fuel Heat Value	0.14	MMBtu/gal	AP-42 Section 1.3				
Maximum Heat Input	6.23	MMBtu/hr	(Maximum Fuel Input) * (Fuel Heat Value)				
Criteria Pollutants							
Pollutant	CAS	Emission Factor		Unlimited Emission Rate (lb/hr)	Unlimited Emission Rate (tpy)	Limited Emission Rate (tpy)	NOTES
PM		0.0697	lb/MMBtu	0.434	1.90	0.07	C
PM10		0.0573	lb/MMBtu	0.357	1.56	0.05	C
PM2.5		0.0556	lb/MMBtu	0.346	1.52	0.05	C
SO2		0.00	lb/MMBtu	0.009	0.04	0.00	A, B
NOx		3.20	lb/MMBtu	19.936	87.32	2.99	A
VOC		0.09	lb/MMBtu	0.561	2.46	0.08	A
CO		0.85	lb/MMBtu	5.296	23.19	0.79	A
Greenhouse Gas (CO <sub>2</sub> e)		163.60	lb/MMBtu	1,019.235	4,464	153	G
CO2		163.1	lb/MMBtu	1,015.815	4,449	152	E
CH <sub>4</sub>		0.007	lb/MMBtu	0.041	0	0	F
N <sub>2</sub> O		0.001	lb/MMBtu	0.008	0	0	F
Organics							
Acetaldehyde	75-07-0	2.52E-05	lb/MMBtu	1.12E-06	4.91E-06	1.68E-07	D
Acrolein	107-02-8	7.88E-06	lb/MMBtu	3.51E-07	1.54E-06	5.26E-08	D
Benzene	71-43-2	7.76E-04	lb/MMBtu	4.83E-03	2.12E-02	7.25E-04	D
Formaldehyde	50-00-0	7.89E-05	lb/MMBtu	4.92E-04	2.15E-03	7.37E-05	D
Naphthalene	91-20-3	1.30E-04	lb/MMBtu	8.10E-04	3.55E-03	1.21E-04	D
Propylene		2.79E-03	lb/MMBtu	1.74E-02	7.61E-02	2.61E-03	D
Toluene	108-88-3	2.81E-04	lb/MMBtu	1.75E-03	7.67E-03	2.63E-04	D
Xylene (o,m,p)	1332-20-7	1.93E-04	lb/MMBtu	1.20E-03	5.27E-03	1.80E-04	D
Acenapthene	83-32-9	4.68E-06	lb/MMBtu	2.92E-05	1.28E-04	4.37E-06	D
Acenapthylene	203-96-8	9.23E-06	lb/MMBtu	5.75E-05	2.52E-04	8.63E-06	D
Anthracene	120-12-7	1.23E-06	lb/MMBtu	7.66E-06	3.36E-05	1.15E-06	D
Benz(a)anthracene	56-55-3	6.22E-07	lb/MMBtu	3.88E-06	1.70E-05	5.81E-07	D
Benzo(a)pyrene	50-32-8	2.57E-07	lb/MMBtu	1.60E-06	7.01E-06	2.40E-07	D
Benzo(b)fluoranthene	205-99-2	1.11E-06	lb/MMBtu	6.92E-06	3.03E-05	1.04E-06	D
Benzo(g,h,i)perylene	191-24-2	5.56E-07	lb/MMBtu	3.46E-06	1.52E-05	5.20E-07	D
Benzo(k)fluoranthene	205-82-3	2.18E-07	lb/MMBtu	1.36E-06	5.95E-06	2.04E-07	D
Chrysene	218-01-9	1.53E-06	lb/MMBtu	9.53E-06	4.17E-05	1.43E-06	D
Dibenzo(a,h)anthracene	53-70-3	3.46E-07	lb/MMBtu	2.16E-06	9.44E-06	3.23E-07	D
Fluoranthene	206-44-0	4.03E-06	lb/MMBtu	2.51E-05	1.10E-04	3.77E-06	D
Fluorene	86-73-7	1.28E-05	lb/MMBtu	7.97E-05	3.49E-04	1.20E-05	D
Indeno(1,2,3-cd)pyrene	193-39-5	4.14E-07	lb/MMBtu	2.58E-06	1.13E-05	3.87E-07	D
Phenanthrene	85-01-8	4.08E-05	lb/MMBtu	2.54E-04	1.11E-03	3.81E-05	D
Pyrene	129-00-0	3.71E-06	lb/MMBtu	2.31E-05	1.01E-04	3.47E-06	D
Polycyclic Organic Matter (POM)					2.22E-03	7.62E-05	
Max HAP					2.12E-02	7.25E-04	
Total HAP					4.20E-02	1.44E-03	

## NOTES

- A AP-42 Table 3.4-1
- B Sulfur Content= 0.0015 % wt
- C AP-42 Table 3.4-2
- D AP-42 Table 3.4-3 and 3.4-4
- E 40 CFR Part 98 Table C-1: Pipeline natural gas = 1028 btu/scf, CO2 emission = 53.02 kg CO2/mmBtu = 120162 lb/MMscf
- F 40 CFR Part 98 Table C-2: Pipeline natural gas = 1028 btu/scf, CH4 = 0.001 kg CH4/mmBtu, N2O = 0.0001 kg N2O / mmBtu
- G CO2e = (Global Warming Potential, GWP) \* (Emission). GWP from 40 CFR Part 98 Table A-1. CO<sub>2</sub> = 1, CH<sub>4</sub> = 21, N<sub>2</sub>O = 310

TABLE A23 : EU17 EMISSION CALCULATIONS (FUEL OIL)							
Parameter	Value	Units	Source				
Emission Unit	EU17		MPCA Emission Unit ID				
Make	Cummins		State operating permit application, November 1995				
Model	QST30-G1		State operating permit application, November 1995				
Maximum Output	1135	bhp	State operating permit application, November 1995				
Fuel	No 2 Fuel Oil						
Maximum Fuel Input	44.50	gal/hr					
Unlimited Annual Operation	8760	hr/yr					
Unlimited Annual Fuel Input	389,820	gal/yr	(Maximum Fuel Input) * (Unlimited Annual Operation)				
Annual Limit	300	hr/yr	Permit Limit				
Fuel Heat Value	0.14	MMBtu/gal	AP-42 Section 1.3				
Maximum Heat Input	6.23	MMBtu/hr	(Maximum Fuel Input) * (Fuel Heat Value)				
Criteria Pollutants							
Pollutant	CAS	Emission Factor		Unlimited Emission Rate (lb/hr)	Unlimited Emission Rate (tpy)	Limited Emission Rate (tpy)	NOTES
PM		0.0697	lb/MMBtu	0.434	1.90	0.07	C
PM10		0.0573	lb/MMBtu	0.357	1.56	0.05	C
PM2.5		0.0556	lb/MMBtu	0.346	1.52	0.05	C
SO2		0.00	lb/MMBtu	0.009	0.04	0.00	A, B
NOx		3.20	lb/MMBtu	19.936	87.32	2.99	A
VOC		0.09	lb/MMBtu	0.561	2.46	0.08	A
CO		0.85	lb/MMBtu	5.296	23.19	0.79	A
Greenhouse Gas (CO <sub>2</sub> e)		163.60	lb/MMBtu	1,019.235	4,464	153	G
CO2		163.1	lb/MMBtu	1,015.815	4,449	152	E
CH <sub>4</sub>		0.007	lb/MMBtu	0.041	0	0	F
N <sub>2</sub> O		0.001	lb/MMBtu	0.008	0	0	F
Organics							
Acetaldehyde	75-07-0	2.52E-05	lb/MMBtu	1.12E-06	4.91E-06	1.68E-07	D
Acrolein	107-02-8	7.88E-06	lb/MMBtu	3.51E-07	1.54E-06	5.26E-08	D
Benzene	71-43-2	7.76E-04	lb/MMBtu	4.83E-03	2.12E-02	7.25E-04	D
Formaldehyde	50-00-0	7.89E-05	lb/MMBtu	4.92E-04	2.15E-03	7.37E-05	D
Naphthalene	91-20-3	1.30E-04	lb/MMBtu	8.10E-04	3.55E-03	1.21E-04	D
Propylene		2.79E-03	lb/MMBtu	1.74E-02	7.61E-02	2.61E-03	D
Toluene	108-88-3	2.81E-04	lb/MMBtu	1.75E-03	7.67E-03	2.63E-04	D
Xylene (o,m,p)	1332-20-7	1.93E-04	lb/MMBtu	1.20E-03	5.27E-03	1.80E-04	D
Acenaphthene	83-32-9	4.68E-06	lb/MMBtu	2.92E-05	1.28E-04	4.37E-06	D
Acenaphthylene	203-96-8	9.23E-06	lb/MMBtu	5.75E-05	2.52E-04	8.63E-06	D
Anthracene	120-12-7	1.23E-06	lb/MMBtu	7.66E-06	3.36E-05	1.15E-06	D
Benz(a)anthracene	56-55-3	6.22E-07	lb/MMBtu	3.88E-06	1.70E-05	5.81E-07	D
Benzo(a)pyrene	50-32-8	2.57E-07	lb/MMBtu	1.60E-06	7.01E-06	2.40E-07	D
Benzo(b)fluoranthene	205-99-2	1.11E-06	lb/MMBtu	6.92E-06	3.03E-05	1.04E-06	D
Benzo(g,h,i)perylene	191-24-2	5.56E-07	lb/MMBtu	3.46E-06	1.52E-05	5.20E-07	D
Benzo(k)fluoranthene	205-82-3	2.18E-07	lb/MMBtu	1.36E-06	5.95E-06	2.04E-07	D
Chrysene	218-01-9	1.53E-06	lb/MMBtu	9.53E-06	4.17E-05	1.43E-06	D
Dibenzo(a,h)anthracene	53-70-3	3.46E-07	lb/MMBtu	2.16E-06	9.44E-06	3.23E-07	D
Fluoranthene	206-44-0	4.03E-06	lb/MMBtu	2.51E-05	1.10E-04	3.77E-06	D
Fluorene	86-73-7	1.28E-05	lb/MMBtu	7.97E-05	3.49E-04	1.20E-05	D
Indeno(1,2,3-cd)pyrene	193-39-5	4.14E-07	lb/MMBtu	2.58E-06	1.13E-05	3.87E-07	D
Phenanthrene	85-01-8	4.08E-05	lb/MMBtu	2.54E-04	1.11E-03	3.81E-05	D
Pyrene	129-00-0	3.71E-06	lb/MMBtu	2.31E-05	1.01E-04	3.47E-06	D
Polycyclic Organic Matter (POM)					2.22E-03	7.62E-05	
Max HAP					2.12E-02	7.25E-04	
Total HAP					4.20E-02	1.44E-03	

## NOTES

- A AP-42 Table 3.4-1
- B Sulfur Content= 0.0015 % wt
- C AP-42 Table 3.4-2
- D AP-42 Table 3.4-3 and 3.4-4
- E 40 CFR Part 98 Table C-1: Pipeline natural gas = 1028 btu/scf, CO<sub>2</sub> emission = 53.02 kg CO<sub>2</sub>/mmBtu = 120162 lb/MMscf
- F 40 CFR Part 98 Table C-2: Pipeline natural gas = 1028 btu/scf, CH<sub>4</sub> = 0.001 kg CH<sub>4</sub>/mmBtu, N<sub>2</sub>O = 0.0001 kg N<sub>2</sub>O / mmBtu
- G CO<sub>2</sub>e = (Global Warming Potential, GWP) \* (Emission). GWP from 40 CFR Part 98 Table A-1. CO<sub>2</sub> = 1, CH<sub>4</sub> = 21, N<sub>2</sub>O = 310

TABLE A24 : EU18 EMISSION CALCULATIONS (FUEL OIL)							
Parameter	Value	Units	Source				
Emission Unit	EU18		MPCA Emission Unit ID				
Make	Caterpillar		State operating permit application, November 1995				
Model	3306B		State operating permit application, November 1995				
Maximum Output	382	bhp	State operating permit application, November 1995				
Fuel	No 2 Fuel Oil						
Maximum Fuel Input	14.98	gal/hr					
Unlimited Annual Operation	500	hr/yr	Unlimited Operation for an emergency generator = 500 hours/yr				
Unlimited Annual Fuel Input	7,489	gal/yr	(Maximum Fuel Input) * (Unlimited Annual Operation)				
Annual Limit	300	hr/yr	Permit Limit				
Fuel Heat Value	0.14	MMBtu/gal	AP-42 Section 1.3				
Maximum Heat Input	2.10	MMBtu/hr	(Maximum Fuel Input) * (Fuel Heat Value)				
Criteria Pollutants							
Pollutant	CAS	Emission Factor		Unlimited Emission Rate (lb/hr)	Unlimited Emission Rate (tpy)	Limited Emission Rate (tpy)	NOTES
PM		0.3100	lb/MMBtu	0.650	0.16	0.10	C
PM10		0.3100	lb/MMBtu	0.650	0.16	0.10	C
PM2.5		0.3100	lb/MMBtu	0.650	0.16	0.10	C
SO2		0.002	lb/MMBtu	0.003	0.00	0.00	A, B
NOx		4.41	lb/MMBtu	9.247	2.31	1.39	C
VOC		0.35	lb/MMBtu	0.734	0.18	0.11	C
CO		0.95	lb/MMBtu	1.992	0.50	0.30	C
Greenhouse Gas (CO2e)		163.60	lb/MMBtu	343.038	86	51	G
CO2		163.1	lb/MMBtu	341.887	85	51	E
CH4		0.007	lb/MMBtu	0.014	0	0	F
N2O		0.001	lb/MMBtu	0.003	0	0	F
Organics							
Acetaldehyde	75-07-0	2.52E-05	lb/MMBtu	3.77E-07	9.44E-08	5.66E-08	D
Acrolein	107-02-8	7.88E-06	lb/MMBtu	1.18E-07	2.95E-08	1.77E-08	D
Benzene	71-43-2	7.76E-04	lb/MMBtu	1.63E-03	4.07E-04	2.44E-04	D
Formaldehyde	50-00-0	7.89E-05	lb/MMBtu	1.65E-04	4.14E-05	2.48E-05	D
Naphthalene	91-20-3	1.30E-04	lb/MMBtu	2.73E-04	6.81E-05	4.09E-05	D
Propylene		2.79E-03	lb/MMBtu	5.85E-03	1.46E-03	8.78E-04	D
Toluene	108-88-3	2.81E-04	lb/MMBtu	5.89E-04	1.47E-04	8.84E-05	D
Xylene (o,m,p)	1332-20-7	1.93E-04	lb/MMBtu	4.05E-04	1.01E-04	6.07E-05	D
Acenaphthene	83-32-9	4.68E-06	lb/MMBtu	9.81E-06	2.45E-06	1.47E-06	D
Acenaphthylene	203-96-8	9.23E-06	lb/MMBtu	1.94E-05	4.84E-06	2.90E-06	D
Anthracene	120-12-7	1.23E-06	lb/MMBtu	2.58E-06	6.45E-07	3.87E-07	D
Benz(a)anthracene	56-55-3	6.22E-07	lb/MMBtu	1.30E-06	3.26E-07	1.96E-07	D
Benzo(a)pyrene	50-32-8	2.57E-07	lb/MMBtu	5.39E-07	1.35E-07	8.08E-08	D
Benzo(b)fluoranthene	205-99-2	1.11E-06	lb/MMBtu	2.33E-06	5.82E-07	3.49E-07	D
Benzo(g,h,i)perylene	191-24-2	5.56E-07	lb/MMBtu	1.17E-06	2.91E-07	1.75E-07	D
Benzo(k)fluoranthene	205-82-3	2.18E-07	lb/MMBtu	4.57E-07	1.14E-07	6.86E-08	D
Chrysene	218-01-9	1.53E-06	lb/MMBtu	3.21E-06	8.02E-07	4.81E-07	D
Dibenzo(a,h)anthracene	53-70-3	3.46E-07	lb/MMBtu	7.25E-07	1.81E-07	1.09E-07	D
Fluoranthene	206-44-0	4.03E-06	lb/MMBtu	8.45E-06	2.11E-06	1.27E-06	D
Fluorene	86-73-7	1.28E-05	lb/MMBtu	2.68E-05	6.71E-06	4.03E-06	D
Indeno(1,2,3-cd)pyrene	193-39-5	4.14E-07	lb/MMBtu	8.68E-07	2.17E-07	1.30E-07	D
Phenanthrene	85-01-8	4.08E-05	lb/MMBtu	8.55E-05	2.14E-05	1.28E-05	D
Pyrene	129-00-0	3.71E-06	lb/MMBtu	7.78E-06	1.94E-06	1.17E-06	D
Polycyclic Organic Matter (POM)					4.27E-05	2.56E-05	
Max HAP					4.07E-04	2.44E-04	
Total HAP					8.07E-04	4.85E-04	

## NOTES

- A AP-42 Table 3.4-1
- B Sulfur Content= 0.0015 % wt
- C AP-42 Table 3.3-1
- D AP-42 Table 3.4-3 and 3.4-4
- E 40 CFR Part 98 Table C-1
- F 40 CFR Part 98 Table C-2
- G CO<sub>2</sub>e = (Global Warming Potential, GWP) \* (Emission). GWP from 40 CFR Part 98 Table A-1. CO<sub>2</sub> = 1, CH<sub>4</sub> = 21, N<sub>2</sub>O = 310

TABLE A25 : GP004 EMISSION CALCULATION SUMMARY						
Parameter	Value	Units	Source			
Emission Unit	GP004		MPCA Emission Unit ID			
Annual Operating Limit	300	hr/yr	Each Generator in GP004			
Criteria Pollutants						
Pollutant	CAS	EU015 Limited Emissions (tpy)	EU016 Limited Emissions (tpy)	EU017 Limited Emissions (tpy)	EU018 Limited Emissions (tpy)	GP004 Limited Emissions (tpy)
PM		0.07	0.07	0.07	0.10	0.29
PM10		0.05	0.05	0.05	0.10	0.26
PM2.5		0.05	0.05	0.05	0.10	0.25
SO2		0.00	0.00	0.00	0.00	0.00
NOx		2.99	2.99	2.99	1.39	10.36
VOC		0.08	0.08	0.08	0.11	0.36
CO		0.79	0.79	0.79	0.30	2.68
Greenhouse Gas (CO <sub>2</sub> e)		153	153	153	51	510
CO <sub>2</sub>		152	152	152	51	508
CH <sub>4</sub>		0.006	0.006	0.006	0.002	0.021
N <sub>2</sub> O		0.001	0.001	0.001	0.000	0.004
Organics						
Acetaldehyde	75-07-0	1.68E-07	1.68E-07	1.68E-07	5.66E-08	5.61E-07
Acrolein	107-02-8	5.26E-08	5.26E-08	5.26E-08	1.77E-08	1.75E-07
Benzene	71-43-2	7.25E-04	7.25E-04	7.25E-04	2.44E-04	2.42E-03
Formaldehyde	50-00-0	7.37E-05	7.37E-05	7.37E-05	2.48E-05	2.46E-04
Naphthalene	91-20-3	1.21E-04	1.21E-04	1.21E-04	4.09E-05	4.05E-04
Propylene		2.61E-03	2.61E-03	2.61E-03	8.78E-04	8.70E-03
Toluene	108-88-3	2.63E-04	2.63E-04	2.63E-04	8.84E-05	8.76E-04
Xylene (o,m,p)	1332-20-7	1.80E-04	1.80E-04	1.80E-04	6.07E-05	6.02E-04
Acenaphthene	83-32-9	4.37E-06	4.37E-06	4.37E-06	1.47E-06	1.46E-05
Acenaphthylene	203-96-8	8.63E-06	8.63E-06	8.63E-06	2.90E-06	2.88E-05
Anthracene	120-12-7	1.15E-06	1.15E-06	1.15E-06	3.87E-07	3.84E-06
Benz(a)anthracene	56-55-3	5.81E-07	5.81E-07	5.81E-07	1.96E-07	1.94E-06
Benzo(a)pyrene	50-32-8	2.40E-07	2.40E-07	2.40E-07	8.08E-08	8.01E-07
Benzo(b)fluoranthene	205-99-2	1.04E-06	1.04E-06	1.04E-06	3.49E-07	3.46E-06
Benzo(g,h,i)perylene	191-24-2	5.20E-07	5.20E-07	5.20E-07	1.75E-07	1.73E-06
Benzo(k)fluoranthene	205-82-3	2.04E-07	2.04E-07	2.04E-07	6.86E-08	6.80E-07
Chrysene	218-01-9	1.43E-06	1.43E-06	1.43E-06	4.81E-07	4.77E-06
Dibenzo(a,h)anthracene	53-70-3	3.23E-07	3.23E-07	3.23E-07	1.09E-07	1.08E-06
Fluoranthene	206-44-0	3.77E-06	3.77E-06	3.77E-06	1.27E-06	1.26E-05
Fluorene	86-73-7	1.20E-05	1.20E-05	1.20E-05	4.03E-06	3.99E-05
Indeno(1,2,3-cd)pyrene	193-39-5	3.87E-07	3.87E-07	3.87E-07	1.30E-07	1.29E-06
Phenanthrene	85-01-8	3.81E-05	3.81E-05	3.81E-05	1.28E-05	1.27E-04
Pyrene	129-00-0	3.47E-06	3.47E-06	3.47E-06	1.17E-06	1.16E-05
Polycyclic Organic Matter (POM)		7.62E-05	7.62E-05	7.62E-05	2.56E-05	2.54E-04
Max HAP						7.25E-04
Total HAP						1.44E-03

## NOTES

Please refer to Tables 21-24 for detailed calculations for each emission unit in GP004.



TABLE A26 : EU19-20 EMISSION CALCULATIONS (NATURAL GAS)									
Parameter	Value	Units		Source					
Emission Unit	EU19-20			MPCA Emission Unit ID					
Make	Ray Pac								
Model	H34001								
Maximum Heat Input (per boiler)	4,000	MMBtu/hr	Per Boiler						
Fuel	Natural Gas								
Maximum Fuel Input (per boiler)	0.0040	MMSCF/hr	(Maximum Heat Input)/(Fuel Heat Value)						
Unlimited Annual Operation	8760	hr/yr	Number of hours in a year						
Unlimited Annual Fuel Input (per boiler)	35	MMSCF/yr	(Maximum Fuel Input) * (Unlimited Annual Operation)						
Annual Limit	none								
Fuel Heat Value	1000	btu/scf	Manufacturer specification						
Number of Boilers	2								
Criteria Pollutants									
Pollutant	CAS	Emission Factor		Unlimited Emission Rate (lb/hr-boiler)	Unlimited Emission Rate (tpy per boiler)	Limited Emission Rate Each Boiler (tpy)	Unlimited Emission Rate All Boilers (tpy)	Limited Emission Rate All Boilers (tpy)	NOTES
PM		7.60	lb/MMSCF	0.030	0.13	0.13	0.27	0.27	A
PM10		7.60	lb/MMSCF	0.030	0.13	0.13	0.27	0.27	A
PM2.5		7.60	lb/MMSCF	0.030	0.13	0.13	0.27	0.27	A
SO <sub>2</sub>		0.60	lb/MMSCF	0.002	0.01	0.01	0.02	0.02	A
NOx		100.00	lb/MMSCF	0.400	1.75	1.75	3.50	3.50	B
VOC		5.50	lb/MMSCF	0.022	0.10	0.10	0.19	0.19	A
CO		84.00	lb/MMSCF	0.336	1.47	1.47	2.94	2.94	B
Greenhouse Gas (CO <sub>2</sub> e)				481	2,107	2,107	4,215	4,215	G
CO <sub>2</sub>		120161	lb/MMSCF	481	2,105	2,105	4,210	4,210	E
CH <sub>4</sub>		2.27E+00	lb/MMSCF	9.07E-03	3.97E-02	3.97E-02	7.94E-02	7.94E-02	F
N <sub>2</sub> O		2.27E-01	lb/MMSCF	9.07E-04	3.97E-03	3.97E-03	7.94E-03	7.94E-03	F
Organics									
Benzene	71-43-2	2.10E-03	lb/MMSCF	8.40E-06	3.68E-05	3.68E-05	7.36E-05	7.36E-05	C
Butane	106-97-8	2.10E+00	lb/MMSCF	8.40E-03	3.68E-02	3.68E-02	7.36E-02	7.36E-02	C
Dichlorobenzene	25321-22-6	1.20E-03	lb/MMSCF	4.80E-06	2.10E-05	2.10E-05	4.20E-05	4.20E-05	C
Ethane	74-84-0	3.10E+00	lb/MMSCF	1.24E-02	5.43E-02	5.43E-02	1.09E-01	1.09E-01	C
Formaldehyde	50-00-0	7.50E-02	lb/MMSCF	3.00E-04	1.31E-03	1.31E-03	2.63E-03	2.63E-03	C
Hexane	110-54-3	1.80E+00	lb/MMSCF	7.20E-03	3.15E-02	3.15E-02	6.31E-02	6.31E-02	C
Naphthalene	91-20-3	6.10E-04	lb/MMSCF	2.44E-06	1.07E-05	1.07E-05	2.14E-05	2.14E-05	C
Pentane	109-66-0	2.60E+00	lb/MMSCF	1.04E-02	4.56E-02	4.56E-02	9.11E-02	9.11E-02	C
Propane	74-98-6	1.60E+00	lb/MMSCF	6.40E-03	2.80E-02	2.80E-02	5.61E-02	5.61E-02	C
Toluene	108-88-3	3.40E-03	lb/MMSCF	1.36E-05	5.96E-05	5.96E-05	1.19E-04	1.19E-04	C
Acenaphthene	83-32-9	1.80E-06	lb/MMSCF	7.20E-09	3.15E-08	3.15E-08	6.31E-08	6.31E-08	C
Acenaphthylene	203-96-8	1.80E-06	lb/MMSCF	7.20E-09	3.15E-08	3.15E-08	6.31E-08	6.31E-08	C
Anthracene	120-12-7	2.40E-06	lb/MMSCF	9.60E-09	4.20E-08	4.20E-08	8.41E-08	8.41E-08	C
Benzo(a)anthracene	56-55-3	1.80E-06	lb/MMSCF	7.20E-09	3.15E-08	3.15E-08	6.31E-08	6.31E-08	C
Benzo(a)pyrene	50-32-8	1.20E-06	lb/MMSCF	4.80E-09	2.10E-08	2.10E-08	4.20E-08	4.20E-08	C
Benzo(b)fluoranthene	205-99-2	1.80E-06	lb/MMSCF	7.20E-09	3.15E-08	3.15E-08	6.31E-08	6.31E-08	C
Benzo(g,h,i)perylene	191-24-2	1.20E-06	lb/MMSCF	4.80E-09	2.10E-08	2.10E-08	4.20E-08	4.20E-08	C
Benzo(k)fluoranthene	205-82-3	1.80E-06	lb/MMSCF	7.20E-09	3.15E-08	3.15E-08	6.31E-08	6.31E-08	C
Chrysene	218-01-9	1.80E-06	lb/MMSCF	7.20E-09	3.15E-08	3.15E-08	6.31E-08	6.31E-08	C
Dibenzo(a,h)anthracene	53-70-3	1.20E-06	lb/MMSCF	4.80E-09	2.10E-08	2.10E-08	4.20E-08	4.20E-08	C
7,12-Dimethylbenz(a)anthracene	57-97-6	1.60E-05	lb/MMSCF	6.40E-08	2.80E-07	2.80E-07	5.61E-07	5.61E-07	C
Fluoranthene	206-44-0	3.00E-06	lb/MMSCF	1.20E-08	5.26E-08	5.26E-08	1.05E-07	1.05E-07	C
Fluorene	86-73-7	2.80E-06	lb/MMSCF	1.12E-08	4.91E-08	4.91E-08	9.81E-08	9.81E-08	C
Indeno(1,2,3-cd)pyrene	193-39-5	1.80E-06	lb/MMSCF	7.20E-09	3.15E-08	3.15E-08	6.31E-08	6.31E-08	C
2-Methylnaphthalene	91-57-6	2.40E-05	lb/MMSCF	9.60E-08	4.20E-07	4.20E-07	8.41E-07	8.41E-07	C
3-Methylchloranthrene	56-49-5	1.80E-06	lb/MMSCF	7.20E-09	3.15E-08	3.15E-08	6.31E-08	6.31E-08	C
Phenanthrene	85-01-8	1.70E-05	lb/MMSCF	6.80E-08	2.98E-07	2.98E-07	5.96E-07	5.96E-07	C
Pyrene	129-00-0	5.00E-05	lb/MMSCF	2.00E-07	8.76E-07	8.76E-07	1.75E-06	1.75E-06	C
Polycyclic Organic Matter (POM)					2.33E-06	2.33E-06	4.67E-06	4.67E-06	
Metals									
Arsenic	7440-38-2	2.00E-04	lb/MMSCF	8.00E-07	3.50E-06	3.50E-06	7.01E-06	7.01E-06	D
Barium	7440-39-3	4.40E-03	lb/MMSCF	1.76E-05	7.71E-05	7.71E-05	1.54E-04	1.54E-04	D
Beryllium	7440-41-7	1.20E-05	lb/MMSCF	4.80E-08	2.10E-07	2.10E-07	4.20E-07	4.20E-07	D
Cadmium	7440-43-9	1.10E-03	lb/MMSCF	4.40E-06	1.93E-05	1.93E-05	3.85E-05	3.85E-05	D
Chromium	7440-47-3	1.40E-03	lb/MMSCF	5.60E-06	2.45E-05	2.45E-05	4.91E-05	4.91E-05	D
Cobalt	7440-48-4	8.40E-05	lb/MMSCF	3.36E-07	1.47E-06	1.47E-06	2.94E-06	2.94E-06	D
Copper	7440-50-8	8.50E-04	lb/MMSCF	3.40E-06	1.49E-05	1.49E-05	2.98E-05	2.98E-05	D
Lead	7139-92-1	5.00E-04	lb/MMSCF	2.00E-06	8.76E-06	8.76E-06	1.75E-05	1.75E-05	D
Manganese	7439-96-5	3.80E-04	lb/MMSCF	1.52E-06	6.66E-06	6.66E-06	1.33E-05	1.33E-05	D
Mercury	7439-97-6	2.60E-04	lb/MMSCF	1.04E-06	4.56E-06	4.56E-06	9.11E-06	9.11E-06	D
Molybdenum	7439-98-7	1.10E-03	lb/MMSCF	4.40E-06	1.93E-05	1.93E-05	3.85E-05	3.85E-05	D
Nickel	7440-02-0	2.10E-03	lb/MMSCF	8.40E-06	3.68E-05	3.68E-05	7.36E-05	7.36E-05	D
Selenium	7782-49-2	2.40E-05	lb/MMSCF	9.60E-08	4.20E-07	4.20E-07	8.41E-07	8.41E-07	D
Vanadium	7440-62-2	2.30E-03	lb/MMSCF	9.20E-06	4.03E-05	4.03E-05	8.06E-05	8.06E-05	D
Zinc	7440-66-6	2.90E-02	lb/MMSCF	1.16E-04	5.08E-04	5.08E-04	1.02E-03	1.02E-03	D
Max HAP					3.15E-02	3.15E-02	6.31E-02	6.31E-02	
Total HAP					3.31E-02	3.31E-02	6.62E-02	6.62E-02	

## NOTES

A

AP-42 Table 1.4-2

B

AP-42 Table 1.4-1

C

AP-42 Table 1.4-3

D

AP-42 Table 1.4-4

E

40 CFR Part 98 Table C-1: Pipeline natural gas = 1028 btu/scf, CO<sub>2</sub> emission = 53.02 kg CO<sub>2</sub>/mmBtu = 120162 lb/MMscf

F

40 CFR Part 98 Table C-2: Pipeline natural gas = 1028 btu/scf, CH<sub>4</sub> = 0.001 kg CH<sub>4</sub>/mmBtu, N<sub>2</sub>O = 0.0001 kg N<sub>2</sub>O / mmBtu

G

CO<sub>2</sub>e = (Global Warming Potential, GWP) \* (Emission). GWP from 40 CFR Part 98 Table A-1. CO<sub>2</sub> = 1, CH<sub>4</sub> = 21, N<sub>2</sub>O = 310



TABLE A27 : EU21-24, EU28 EMISSION CALCULATIONS (NATURAL GAS)									
Parameter	Value	Units	Source						
Emission Unit	EU21-24 & 28		MPCA Emission Unit ID						
Make	Hydrotherm								
Model	KN-30								
Maximum Heat Input (per boiler)	3,000	MMBtu/hr							
Fuel	Natural Gas								
Maximum Fuel Input (per boiler)	0.0030	MMSCF/hr	(Maximum Heat Input)/(Fuel Heat Value)						
Unlimited Annual Operation	8760	hr/yr	Number of hours in a year						
Unlimited Annual Fuel Input (per boiler)	26	MMSCF/yr	(Maximum Fuel Input) * (Unlimited Annual Operation)						
Annual Limit	none								
Fuel Heat Value	1000	btu/scf	Manufacturer specification						
Number of Boilers	5								
Criteria Pollutants									
Pollutant	CAS	Emission Factor	Unlimited Emission Rate (lb/hr-boiler)	Unlimited Emission Rate (tpy per boiler)	Limited Emission Rate Each Boiler (tpy)	Unlimited Emission Rate All Boilers (tpy)	Limited Emission Rate All Boilers (tpy)	NOTES	
PM		7.60 lb/MMSCF	0.023	0.10	0.10	0.50	0.50	A	
PM10		7.60 lb/MMSCF	0.023	0.10	0.10	0.50	0.50	A	
PM2.5		7.60 lb/MMSCF	0.023	0.10	0.10	0.50	0.50	A	
SO <sub>2</sub>		0.60 lb/MMSCF	0.002	0.01	0.01	0.04	0.04	A	
NO <sub>x</sub>		100.00 lb/MMSCF	0.300	1.31	1.31	6.57	6.57	B	
VOC		5.50 lb/MMSCF	0.017	0.07	0.07	0.36	0.36	A	
CO		84.00 lb/MMSCF	0.252	1.10	1.10	5.52	5.52	B	
Greenhouse Gas (CO <sub>2</sub> e)			361	1,580	1,580	7,902	7,902	G	
CO <sub>2</sub>		120161 lb/MMSCF	360	1,579	1,579	7,895	7,895	E	
CH <sub>4</sub>		2.27E+00 lb/MMSCF	6.80E-03	2.98E-02	2.98E-02	1.49E-01	1.49E-01	F	
N <sub>2</sub> O		2.27E-01 lb/MMSCF	6.80E-04	2.98E-03	2.98E-03	1.49E-02	1.49E-02	F	
Organics									
Benzene	71-43-2	2.10E-03 lb/MMSCF	6.30E-06	2.76E-05	2.76E-05	1.38E-04	1.38E-04	C	
Butane	106-97-8	2.10E+00 lb/MMSCF	6.30E-03	2.76E-02	2.76E-02	1.38E-01	1.38E-01	C	
Dichlorobenzene	25321-22-6	1.20E-03 lb/MMSCF	3.60E-06	1.58E-05	1.58E-05	7.88E-05	7.88E-05	C	
Ethane	74-84-0	3.10E+00 lb/MMSCF	9.30E-03	4.07E-02	4.07E-02	2.04E-01	2.04E-01	C	
Formaldehyde	50-00-0	7.50E-02 lb/MMSCF	2.25E-04	9.86E-04	9.86E-04	4.93E-03	4.93E-03	C	
Hexane	110-54-3	1.80E+00 lb/MMSCF	5.40E-03	2.37E-02	2.37E-02	1.18E-01	1.18E-01	C	
Naphthalene	91-20-3	6.10E-04 lb/MMSCF	1.83E-06	8.02E-06	8.02E-06	4.01E-05	4.01E-05	C	
Pentane	109-66-0	2.60E+00 lb/MMSCF	7.80E-03	3.42E-02	3.42E-02	1.71E-01	1.71E-01	C	
Propane	74-98-6	1.60E+00 lb/MMSCF	4.80E-03	2.10E-02	2.10E-02	1.05E-01	1.05E-01	C	
Toluene	108-88-3	3.40E-03 lb/MMSCF	1.02E-05	4.47E-05	4.47E-05	2.23E-04	2.23E-04	C	
Acenaphthene	83-32-9	1.80E-06 lb/MMSCF	5.40E-09	2.37E-08	2.37E-08	1.18E-07	1.18E-07	C	
Acenaphthylene	203-96-8	1.80E-06 lb/MMSCF	5.40E-09	2.37E-08	2.37E-08	1.18E-07	1.18E-07	C	
Anthracene	120-12-7	2.40E-06 lb/MMSCF	7.20E-09	3.15E-08	3.15E-08	1.58E-07	1.58E-07	C	
Benzo(a)anthracene	56-55-3	1.80E-06 lb/MMSCF	5.40E-09	2.37E-08	2.37E-08	1.18E-07	1.18E-07	C	
Benzo(a)pyrene	50-32-8	1.20E-06 lb/MMSCF	3.60E-09	1.58E-08	1.58E-08	7.88E-08	7.88E-08	C	
Benzo(b)fluoranthene	205-99-2	1.80E-06 lb/MMSCF	5.40E-09	2.37E-08	2.37E-08	1.18E-07	1.18E-07	C	
Benzo(g,h,i)perylene	191-24-2	1.20E-06 lb/MMSCF	3.60E-09	1.58E-08	1.58E-08	7.88E-08	7.88E-08	C	
Benzo(k)fluoranthene	205-82-3	1.80E-06 lb/MMSCF	5.40E-09	2.37E-08	2.37E-08	1.18E-07	1.18E-07	C	
Chrysene	218-01-9	1.80E-06 lb/MMSCF	5.40E-09	2.37E-08	2.37E-08	1.18E-07	1.18E-07	C	
Dibenzo(a,h)anthracene	53-70-3	1.20E-06 lb/MMSCF	3.60E-09	1.58E-08	1.58E-08	7.88E-08	7.88E-08	C	
7,12-Dimethylbenz(a)anthracene	57-97-6	1.60E-05 lb/MMSCF	4.80E-08	2.10E-07	2.10E-07	1.05E-06	1.05E-06	C	
Fluoranthene	206-44-0	3.00E-06 lb/MMSCF	9.00E-09	3.94E-08	3.94E-08	1.97E-07	1.97E-07	C	
Fluorene	86-73-7	2.80E-06 lb/MMSCF	8.40E-09	3.68E-08	3.68E-08	1.84E-07	1.84E-07	C	
Indeno(1,2,3-cd)pyrene	193-39-5	1.80E-06 lb/MMSCF	5.40E-09	2.37E-08	2.37E-08	1.18E-07	1.18E-07	C	
2-Methylnaphthalene	91-57-6	2.40E-05 lb/MMSCF	7.20E-08	3.15E-07	3.15E-07	1.58E-06	1.58E-06	C	
3-Methylchloranthrene	56-49-5	1.80E-06 lb/MMSCF	5.40E-09	2.37E-08	2.37E-08	1.18E-07	1.18E-07	C	
Phenanthrene	85-01-8	1.70E-05 lb/MMSCF	5.10E-08	2.23E-07	2.23E-07	1.12E-06	1.12E-06	C	
Pyrene	129-00-0	5.00E-05 lb/MMSCF	1.50E-07	6.57E-07	6.57E-07	3.29E-06	3.29E-06	C	
Polycyclic Organic Matter (POM)				1.75E-06	1.75E-06	8.75E-06	8.75E-06		
Metals									
Arsenic	7440-38-2	2.00E-04 lb/MMSCF	6.00E-07	2.63E-06	2.63E-06	1.31E-05	1.31E-05	D	
Barium	7440-39-3	4.40E-03 lb/MMSCF	1.32E-05	5.78E-05	5.78E-05	2.89E-04	2.89E-04	D	
Beryllium	7440-41-7	1.20E-05 lb/MMSCF	3.60E-08	1.58E-07	1.58E-07	7.88E-07	7.88E-07	D	
Cadmium	7440-43-9	1.10E-03 lb/MMSCF	3.30E-06	1.45E-05	1.45E-05	7.23E-05	7.23E-05	D	
Chromium	7440-47-3	1.40E-03 lb/MMSCF	4.20E-06	1.84E-05	1.84E-05	9.20E-05	9.20E-05	D	
Cobalt	7440-48-4	8.40E-05 lb/MMSCF	2.52E-07	1.10E-06	1.10E-06	5.52E-06	5.52E-06	D	
Copper	7440-50-8	8.50E-04 lb/MMSCF	2.55E-06	1.12E-05	1.12E-05	5.58E-05	5.58E-05	D	
Lead	7139-92-1	5.00E-04 lb/MMSCF	1.50E-06	6.57E-06	6.57E-06	3.29E-05	3.29E-05	D	
Manganese	7439-96-5	3.80E-04 lb/MMSCF	1.14E-06	4.99E-06	4.99E-06	2.50E-05	2.50E-05	D	
Mercury	7439-97-6	2.60E-04 lb/MMSCF	7.80E-07	3.42E-06	3.42E-06	1.71E-05	1.71E-05	D	
Molybdenum	7439-98-7	1.10E-03 lb/MMSCF	3.30E-06	1.45E-05	1.45E-05	7.23E-05	7.23E-05	D	
Nickel	7440-02-0	2.10E-03 lb/MMSCF	6.30E-06	2.76E-05	2.76E-05	1.38E-04	1.38E-04	D	
Selenium	7782-49-2	2.40E-05 lb/MMSCF	7.20E-08	3.15E-07	3.15E-07	1.58E-06	1.58E-06	D	
Vanadium	7440-62-2	2.30E-03 lb/MMSCF	6.90E-06	3.02E-05	3.02E-05	1.51E-04	1.51E-04	D	
Zinc	7440-66-6	2.90E-02 lb/MMSCF	8.70E-05	3.81E-04	3.81E-04	1.91E-03	1.91E-03	D	
Max HAP				2.37E-02	2.37E-02	1.18E-01	1.18E-01		
Total HAP				2.48E-02	2.48E-02	1.24E-01	1.24E-01		

## NOTES

A

AP-42 Table 1.4-2

B

AP-42 Table 1.4-1

C

AP-42 Table 1.4-3

D

AP-42 Table 1.4-4

E

40 CFR Part 98 Table C-1: Pipeline natural gas = 1028 btu/scf, CO<sub>2</sub> emission = 53.02 kg CO<sub>2</sub>/mmBtu = 120162 lb/MMscf

F

40 CFR Part 98 Table C-2: Pipeline natural gas = 1028 btu/scf, CH<sub>4</sub> = 0.001 kg CH<sub>4</sub>/mmBtu, N<sub>2</sub>O = 0.0001 kg N<sub>2</sub>O / mmBtu

G

CO<sub>2</sub>e = (Global Warming Potential, GWP) \* (Emission). GWP from 40 CFR Part 98 Table A-1. CO<sub>2</sub> = 1, CH<sub>4</sub> = 21, N<sub>2</sub>O = 310

TABLE A28 : EU25-26 EMISSION CALCULATIONS (NATURAL GAS)									
Parameter	Value	Units	Source						
Emission Unit	EU25-26		MPCA Emission Unit ID						
Make	Lattner								
Model	WLF - 40								
Maximum Heat Input (per boiler)	1.675	MMBtu/hr							
Fuel	Natural Gas								
Maximum Fuel Input (per boiler)	0.0017	MMSCF/hr	(Maximum Heat Input)/(Fuel Heat Value)						
Unlimited Annual Operation	8760	hr/yr	Number of hours in a year						
Unlimited Annual Fuel Input (per boiler)	15	MMSCF/yr	(Maximum Fuel Input) * (Unlimited Annual Operation)						
Annual Limit	none								
Fuel Heat Value	1000	btu/scf	Manufacturer specification						
Number of Boilers	2								
Criteria Pollutants									
Pollutant	CAS	Emission Factor	Unlimited Emission Rate (lb/hr-boiler)	Unlimited Emission Rate (tpy per boiler)	Limited Emission Rate Each Boiler (tpy)	Unlimited Emission Rate All Boilers (tpy)	Limited Emission Rate All Boilers (tpy)	NOTES	
PM		7.60 lb/MMSCF	0.013	0.06	0.06	0.11	0.11	A	
PM10		7.60 lb/MMSCF	0.013	0.06	0.06	0.11	0.11	A	
PM2.5		7.60 lb/MMSCF	0.013	0.06	0.06	0.11	0.11	A	
SO <sub>2</sub>		0.60 lb/MMSCF	0.001	0.004	0.00	0.01	0.01	A	
NOx		100.00 lb/MMSCF	0.168	0.73	0.73	1.47	1.47	B	
VOC		5.50 lb/MMSCF	0.009	0.04	0.04	0.08	0.08	A	
CO		84.00 lb/MMSCF	0.141	0.62	0.62	1.23	1.23	B	
Greenhouse Gas (CO <sub>2</sub> e)			201	882	882	1,765	1,765	G	
CO <sub>2</sub>		120161 lb/MMSCF	201	882	882	1,763	1,763	E	
CH <sub>4</sub>		2.27E+00 lb/MMSCF	3.80E-03	1.66E-02	1.66E-02	3.33E-02	3.33E-02	F	
N <sub>2</sub> O		2.27E-01 lb/MMSCF	3.80E-04	1.66E-03	1.66E-03	3.33E-03	3.33E-03	F	
Organics									
Benzene	71-43-2	2.10E-03 lb/MMSCF	3.52E-06	1.54E-05	1.54E-05	3.08E-05	3.08E-05	C	
Butane	106-97-8	2.10E+00 lb/MMSCF	3.52E-03	1.54E-02	1.54E-02	3.08E-02	3.08E-02	C	
Dichlorobenzene	25321-22-6	1.20E-03 lb/MMSCF	2.01E-06	8.80E-06	8.80E-06	1.76E-05	1.76E-05	C	
Ethane	74-84-0	3.10E+00 lb/MMSCF	5.19E-03	2.27E-02	2.27E-02	4.55E-02	4.55E-02	C	
Formaldehyde	50-00-0	7.50E-02 lb/MMSCF	1.26E-04	5.50E-04	5.50E-04	1.10E-03	1.10E-03	C	
Hexane	110-54-3	1.80E+00 lb/MMSCF	3.02E-03	1.32E-02	1.32E-02	2.64E-02	2.64E-02	C	
Naphthalene	91-20-3	6.10E-04 lb/MMSCF	1.02E-06	4.48E-06	4.48E-06	8.95E-06	8.95E-06	C	
Pentane	109-66-0	2.60E+00 lb/MMSCF	4.36E-03	1.91E-02	1.91E-02	3.81E-02	3.81E-02	C	
Propane	74-98-6	1.60E+00 lb/MMSCF	2.68E-03	1.17E-02	1.17E-02	2.35E-02	2.35E-02	C	
Toluene	108-88-3	3.40E-03 lb/MMSCF	5.70E-06	2.49E-05	2.49E-05	4.99E-05	4.99E-05	C	
Acenaphthene	83-32-9	1.80E-06 lb/MMSCF	3.02E-09	1.32E-08	1.32E-08	2.64E-08	2.64E-08	C	
Acenaphthylene	203-96-8	1.80E-06 lb/MMSCF	3.02E-09	1.32E-08	1.32E-08	2.64E-08	2.64E-08	C	
Anthracene	120-12-7	2.40E-06 lb/MMSCF	4.02E-09	1.76E-08	1.76E-08	3.52E-08	3.52E-08	C	
Benz(a)anthracene	56-55-3	1.80E-06 lb/MMSCF	3.02E-09	1.32E-08	1.32E-08	2.64E-08	2.64E-08	C	
Benzo(a)pyrene	50-32-8	1.20E-06 lb/MMSCF	2.01E-09	8.80E-09	8.80E-09	1.76E-08	1.76E-08	C	
Benzo(b)fluoranthene	205-99-2	1.80E-06 lb/MMSCF	3.02E-09	1.32E-08	1.32E-08	2.64E-08	2.64E-08	C	
Benzo(g,h,i)perylene	191-24-2	1.20E-06 lb/MMSCF	2.01E-09	8.80E-09	8.80E-09	1.76E-08	1.76E-08	C	
Benzo(k)fluoranthene	205-82-3	1.80E-06 lb/MMSCF	3.02E-09	1.32E-08	1.32E-08	2.64E-08	2.64E-08	C	
Chrysene	218-01-9	1.80E-06 lb/MMSCF	3.02E-09	1.32E-08	1.32E-08	2.64E-08	2.64E-08	C	
Dibenzo(a,h)anthracene	53-70-3	1.20E-06 lb/MMSCF	2.01E-09	8.80E-09	8.80E-09	1.76E-08	1.76E-08	C	
7,12-Dimethylbenz(a)anthracene	57-97-6	1.60E-05 lb/MMSCF	2.68E-08	1.17E-07	1.17E-07	2.35E-07	2.35E-07	C	
Fluoranthene	206-44-0	3.00E-06 lb/MMSCF	5.03E-09	2.20E-08	2.20E-08	4.40E-08	4.40E-08	C	
Fluorene	86-73-7	2.80E-06 lb/MMSCF	4.69E-09	2.05E-08	2.05E-08	4.11E-08	4.11E-08	C	
Indeno(1,2,3-cd)pyrene	193-39-5	1.80E-06 lb/MMSCF	3.02E-09	1.32E-08	1.32E-08	2.64E-08	2.64E-08	C	
2-Methylnaphthalene	91-57-6	2.40E-05 lb/MMSCF	4.02E-08	1.76E-07	1.76E-07	3.52E-07	3.52E-07	C	
3-Methylchloranthrene	56-49-5	1.80E-06 lb/MMSCF	3.02E-09	1.32E-08	1.32E-08	2.64E-08	2.64E-08	C	
Phenanthrene	85-01-8	1.70E-05 lb/MMSCF	2.85E-08	1.25E-07	1.25E-07	2.49E-07	2.49E-07	C	
Pyrene	129-00-0	5.00E-05 lb/MMSCF	8.38E-08	3.67E-07	3.67E-07	7.34E-07	7.34E-07	C	
Polycyclic Organic Matter (POM)				9.77E-07	9.77E-07	1.95E-06	1.95E-06		
Metals									
Arsenic	7440-38-2	2.00E-04 lb/MMSCF	3.35E-07	1.47E-06	1.47E-06	2.93E-06	2.93E-06	D	
Barium	7440-39-3	4.40E-03 lb/MMSCF	7.37E-06	3.23E-05	3.23E-05	6.46E-05	6.46E-05	D	
Beryllium	7440-41-7	1.20E-05 lb/MMSCF	2.01E-08	8.80E-08	8.80E-08	1.76E-07	1.76E-07	D	
Cadmium	7440-43-9	1.10E-03 lb/MMSCF	1.84E-06	8.07E-06	8.07E-06	1.61E-05	1.61E-05	D	
Chromium	7440-47-3	1.40E-03 lb/MMSCF	2.35E-06	1.03E-05	1.03E-05	2.05E-05	2.05E-05	D	
Cobalt	7440-48-4	8.40E-05 lb/MMSCF	1.41E-07	6.16E-07	6.16E-07	1.23E-06	1.23E-06	D	
Copper	7440-50-8	8.50E-04 lb/MMSCF	1.42E-06	6.24E-06	6.24E-06	1.25E-05	1.25E-05	D	
Lead	7139-92-1	5.00E-04 lb/MMSCF	8.38E-07	3.67E-06	3.67E-06	7.34E-06	7.34E-06	D	
Manganese	7439-96-5	3.80E-04 lb/MMSCF	6.37E-07	2.79E-06	2.79E-06	5.58E-06	5.58E-06	D	
Mercury	7439-97-6	2.60E-04 lb/MMSCF	4.36E-07	1.91E-06	1.91E-06	3.81E-06	3.81E-06	D	
Molybdenum	7439-98-7	1.10E-03 lb/MMSCF	1.84E-06	8.07E-06	8.07E-06	1.61E-05	1.61E-05	D	
Nickel	7440-02-0	2.10E-03 lb/MMSCF	3.52E-06	1.54E-05	1.54E-05	3.08E-05	3.08E-05	D	
Selenium	7782-49-2	2.40E-05 lb/MMSCF	4.02E-08	1.76E-07	1.76E-07	3.52E-07	3.52E-07	D	
Vanadium	7440-62-2	2.30E-03 lb/MMSCF	3.85E-06	1.69E-05	1.69E-05	3.37E-05	3.37E-05	D	
Zinc	7440-66-6	2.90E-02 lb/MMSCF	4.86E-05	2.13E-04	2.13E-04	4.26E-04	4.26E-04	D	
Max HAP				1.32E-02	1.32E-02	2.64E-02	2.64E-02		
Total HAP				1.39E-02	1.39E-02	2.77E-02	2.77E-02		

## NOTES

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AP-42 Table 1.4-2

AP-42 Table 1.4-1

AP-42 Table 1.4-3

AP-42 Table 1.4-4

40 CFR Part 98 Table C-1: Pipeline natural gas = 1028 btu/scf, CO<sub>2</sub> emission = 53.02 kg CO<sub>2</sub>/mmBtu = 120162 lb/MMscf40 CFR Part 98 Table C-2: Pipeline natural gas = 1028 btu/scf, CH<sub>4</sub> = 0.001 kg CH<sub>4</sub>/mmBtu, N<sub>2</sub>O = 0.0001 kg N<sub>2</sub>O / mmBtuCO<sub>2</sub>e = (Global Warming Potential, GWP) \* (Emission). GWP from 40 CFR Part 98 Table A-1. CO<sub>2</sub> = 1, CH<sub>4</sub> = 21, N<sub>2</sub>O = 310

TABLE A29 : GP05 EMISSION CALCULATION SUMMARY					
Parameter	Value	Units	Source		
Emission Unit	GP005		MPCA Emission Unit ID		
Annual Limit	8760	hours			
Criteria Pollutants					
Pollutant	CAS	EU21-24, 28	EU25-26	EU19-20	GP005 Limited
PM		0.50	0.11	0.27	0.88
PM10		0.50	0.11	0.27	0.88
PM2.5		0.50	0.11	0.27	0.88
SO2		0.04	0.01	0.02	0.07
NOx		6.57	1.47	3.50	11.54
VOC		0.36	0.08	0.19	0.63
CO		5.52	1.23	2.94	9.69
Greenhouse Gas (CO <sub>2</sub> e)		7,902	1,765	4,215	13,882
CO <sub>2</sub>		7895	1763	4210	13868
CH <sub>4</sub>		1.49E-01	3.33E-02	7.94E-02	2.62E-01
N <sub>2</sub> O		1.49E-02	3.33E-03	7.94E-03	2.62E-02
Organics					
Benzene	71-43-2	1.38E-04	3.08E-05	7.36E-05	2.42E-04
Butane	106-97-8	1.38E-01	3.08E-02	7.36E-02	2.42E-01
Dichlorobenzene	25321-22-6	7.88E-05	1.76E-05	4.20E-05	1.38E-04
Ethane	74-84-0	2.04E-01	4.55E-02	1.09E-01	3.58E-01
Formaldehyde	50-00-0	4.93E-03	1.10E-03	2.63E-03	8.66E-03
Hexane	110-54-3	1.18E-01	2.64E-02	6.31E-02	2.08E-01
Naphthalene	91-20-3	4.01E-05	8.95E-06	2.14E-05	7.04E-05
Pentane	109-66-0	1.71E-01	3.81E-02	9.11E-02	3.00E-01
Propane	74-98-6	1.05E-01	2.35E-02	5.61E-02	1.85E-01
Toluene	108-88-3	2.23E-04	4.99E-05	1.19E-04	3.92E-04
Acenaphthene	83-32-9	1.18E-07	2.64E-08	6.31E-08	2.08E-07
Acenaphthylene	203-96-8	1.18E-07	2.64E-08	6.31E-08	2.08E-07
Anthracene	120-12-7	1.58E-07	3.52E-08	8.41E-08	2.77E-07
Benz(a)anthracene	56-55-3	1.18E-07	2.64E-08	6.31E-08	2.08E-07
Benzo(a)pyrene	50-32-8	7.88E-08	1.76E-08	4.20E-08	1.38E-07
Benzo(b)fluoranthene	205-99-2	1.18E-07	2.64E-08	6.31E-08	2.08E-07
Benzo(g,h,i)perylene	191-24-2	7.88E-08	1.76E-08	4.20E-08	1.38E-07
Benzo(k)fluoranthene	205-82-3	1.18E-07	2.64E-08	6.31E-08	2.08E-07
Chrysene	218-01-9	1.18E-07	2.64E-08	6.31E-08	2.08E-07
Dibenzo(a,h)anthracene	53-70-3	7.88E-08	1.76E-08	4.20E-08	1.38E-07
7,12-Dimethylbenz(a)anthracene	57-97-6	1.05E-06	2.35E-07	5.61E-07	1.85E-06
Fluoranthene	206-44-0	1.97E-07	4.40E-08	1.05E-07	3.46E-07
Fluorene	86-73-7	1.84E-07	4.11E-08	9.81E-08	3.23E-07
Indeno(1,2,3-cd)pyrene	193-39-5	1.18E-07	2.64E-08	6.31E-08	2.08E-07
2-Methylnaphthalene	91-57-6	1.58E-06	3.52E-07	8.41E-07	2.77E-06
3-Methylchloranthrene	56-49-5	1.18E-07	2.64E-08	6.31E-08	2.08E-07
Phenanthrene	85-01-8	1.12E-06	2.49E-07	5.96E-07	1.96E-06
Pyrene	129-00-0	3.29E-06	7.34E-07	1.75E-06	5.77E-06
Polycyclic Organic Matter (POM)		8.75E-06	1.95E-06	4.67E-06	1.54E-05
Metals					
Arsenic	7440-38-2	1.31E-05	2.93E-06	7.01E-06	2.31E-05
Barium	7440-39-3	2.89E-04	6.46E-05	1.54E-04	5.08E-04
Beryllium	7440-41-7	7.88E-07	1.76E-07	4.20E-07	1.38E-06
Cadmium	7440-43-9	7.23E-05	1.61E-05	3.85E-05	1.27E-04
Chromium	7440-47-3	9.20E-05	2.05E-05	4.91E-05	1.62E-04
Cobalt	7440-48-4	5.52E-06	1.23E-06	2.94E-06	9.69E-06
Copper	7440-50-8	5.58E-05	1.25E-05	2.98E-05	9.81E-05
Lead	7139-92-1	3.29E-05	7.34E-06	1.75E-05	5.77E-05
Manganese	7439-96-5	2.50E-05	5.58E-06	1.33E-05	4.39E-05
Mercury	7439-97-6	1.71E-05	3.81E-06	9.11E-06	3.00E-05
Molybdenum	7439-98-7	7.23E-05	1.61E-05	3.85E-05	1.27E-04
Nickel	7440-02-0	1.38E-04	3.08E-05	7.36E-05	2.42E-04
Selenium	7782-49-2	1.58E-06	3.52E-07	8.41E-07	2.77E-06
Vanadium	7440-62-2	1.51E-04	3.37E-05	8.06E-05	2.65E-04
Zinc	7440-66-6	1.91E-03	4.26E-04	1.02E-03	3.35E-03
Max HAP		1.18E-01	0.0264114	0.063072	2.08E-01
Total HAP		1.24E-01	0.027710007	0.066173152	2.18E-01

## NOTES

Please refer to Tables 26-28 for detailed calculations for each emission unit in GP005.

TABLE A30 : EU27 EMISSION CALCULATIONS (FUEL OIL)							
Parameter	Value	Units	Source				
Emission Unit	EU27		MPCA Emission Unit ID				
Make	Caterpillar						
Model	DM8263						
Maximum Output	2937	bhp					
Fuel	No 2 Fuel Oil						
Maximum Fuel Input	138	gal/hr					
Unlimited Annual Operation	500	hr/yr	Unlimited Operation for an emergency generator = 500 hours/yr				
Unlimited Annual Fuel Input	69,000	gal/yr	(Maximum Fuel Input) * (Unlimited Annual Operation)				
Annual Limit	300	hr/yr	Permit Limit				
Fuel Heat Value	0.14	MMBtu/gal	AP-42 Section 1.3				
Maximum Heat Input	19.32	MMBtu/hr	(Maximum Fuel Input) * (Fuel Heat Value)				
Criteria Pollutants							
Pollutant	CAS	Emission Factor		Unlimited Emission Rate (lb/hr)	Unlimited Emission Rate (tpy)	Limited Emission Rate (tpy)	NOTES
PM		0.2300	lb/hr	0.230	0.06	0.03	C
PM10		0.2300	lb/hr	0.230	0.06	0.03	C
PM2.5		0.2300	lb/hr	0.230	0.06	0.03	C
SO2		0.002	lb/MMBtu	0.029	0.01	0.004	A, B
NOx		42.10	lb/hr	42.100	10.53	6.32	C
VOC		0.93	lb/hr	0.930	0.23	0.14	A
CO		3.45	lb/hr	3.450	0.86	0.52	A
Greenhouse Gas (CO2e)		163.60	lb/MMBtu	3,160.774	790	474	G
CO2		163.1	lb/MMBtu	3,150.169	788	473	E
CH4		0.007	lb/MMBtu	0.128	0	0	F
N2O		0.001	lb/MMBtu	0.026	0	0	F
Organics							
Acetaldehyde	75-07-0	2.52E-05	lb/MMBtu	3.48E-06	8.69E-07	5.22E-07	D
Acrolein	107-02-8	7.88E-06	lb/MMBtu	1.09E-06	2.72E-07	1.63E-07	D
Benzene	71-43-2	7.76E-04	lb/MMBtu	1.50E-02	3.75E-03	2.25E-03	D
Formaldehyde	50-00-0	7.89E-05	lb/MMBtu	1.52E-03	3.81E-04	2.29E-04	D
Naphthalene	91-20-3	1.30E-04	lb/MMBtu	2.51E-03	6.28E-04	3.77E-04	D
Propylene		2.79E-03	lb/MMBtu	5.39E-02	1.35E-02	8.09E-03	D
Toluene	108-88-3	2.81E-04	lb/MMBtu	5.43E-03	1.36E-03	8.14E-04	D
Xylene (o,m,p)	1332-20-7	1.93E-04	lb/MMBtu	3.73E-03	9.32E-04	5.59E-04	D
Acenaphthene	83-32-9	4.68E-06	lb/MMBtu	9.04E-05	2.26E-05	1.36E-05	D
Acenaphthylene	203-96-8	9.23E-06	lb/MMBtu	1.78E-04	4.46E-05	2.67E-05	D
Anthracene	120-12-7	1.23E-06	lb/MMBtu	2.38E-05	5.94E-06	3.56E-06	D
Benz(a)anthracene	56-55-3	6.22E-07	lb/MMBtu	1.20E-05	3.00E-06	1.80E-06	D
Benzo(a)pyrene	50-32-8	2.57E-07	lb/MMBtu	4.97E-06	1.24E-06	7.45E-07	D
Benzo(b)fluoranthene	205-99-2	1.11E-06	lb/MMBtu	2.14E-05	5.36E-06	3.22E-06	D
Benzo(g,h,i)perylene	191-24-2	5.56E-07	lb/MMBtu	1.07E-05	2.69E-06	1.61E-06	D
Benzo(k)fluoranthene	205-82-3	2.18E-07	lb/MMBtu	4.21E-06	1.05E-06	6.32E-07	D
Chrysene	218-01-9	1.53E-06	lb/MMBtu	2.96E-05	7.39E-06	4.43E-06	D
Dibenzo(a,h)anthracene	53-70-3	3.46E-07	lb/MMBtu	6.68E-06	1.67E-06	1.00E-06	D
Fluoranthene	206-44-0	4.03E-06	lb/MMBtu	7.79E-05	1.95E-05	1.17E-05	D
Fluorene	86-73-7	1.28E-05	lb/MMBtu	2.47E-04	6.18E-05	3.71E-05	D
Indeno(1,2,3-cd)pyrene	193-39-5	4.14E-07	lb/MMBtu	8.00E-06	2.00E-06	1.20E-06	D
Phenanthrene	85-01-8	4.08E-05	lb/MMBtu	7.88E-04	1.97E-04	1.18E-04	D
Pyrene	129-00-0	3.71E-06	lb/MMBtu	7.17E-05	1.79E-05	1.08E-05	D
Polycyclic Organic Matter (POM)		8.15E-05		1.58E-03	3.94E-04	2.36E-04	
Max HAP					3.75E-03	2.25E-03	
Total HAP					7.44E-03	4.46E-03	

## NOTES

- A AP-42 Table 3.4-1
- B Sulfur Content= 0.0015 % wt
- C Manufacturer, not to exceed at 100% load.
- D AP-42 Table 3.4-3 and 3.4-4
- E 40 CFR Part 98 Table C-1: Pipeline natural gas = 1028 btu/scf, CO<sub>2</sub> emission = 53.02 kg CO<sub>2</sub>/mmBtu = 120162 lb/MMscf
- F 40 CFR Part 98 Table C-2: Pipeline natural gas = 1028 btu/scf, CH<sub>4</sub> = 0.001 kg CH<sub>4</sub>/mmBtu, N<sub>2</sub>O = 0.0001 kg N<sub>2</sub>O / mmBtu
- G CO<sub>2</sub>e = (Global Warming Potential, GWP) \* (Emission). GWP from 40 CFR Part 98 Table A-1. CO<sub>2</sub> = 1, CH<sub>4</sub> = 21, N<sub>2</sub>O = 310

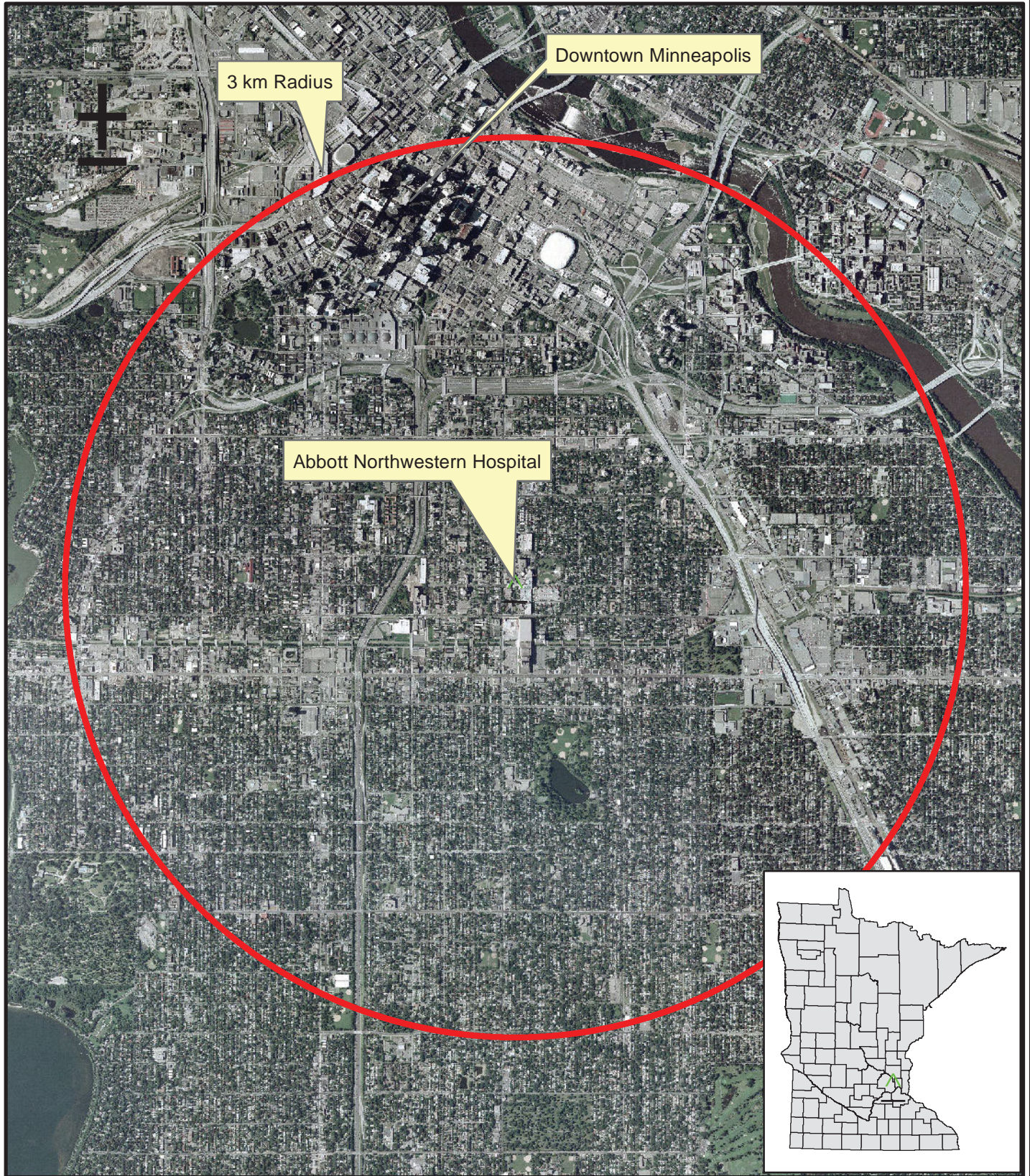
TABLE A31 : EMISSION CALCULATIONS FOR TWO NEW BOILERS (INSIGNIFICANT ACTIVITIES UNDER MN 7007.1300 Subp. 3(l))									
Parameter	Value	Units	Source						
Emission Unit	N/A		These are insignificant emission units						
Make	Fulton								
Model	WLF - 40								
Maximum Heat Input (per boiler)	0.199	MMBtu/hr							
Fuel	Natural Gas								
Maximum Fuel Input (per boiler)	0.0002	MMSCF/hr	(Maximum Heat Input)/(Fuel Heat Value)						
Unlimited Annual Operation	8760	hr/yr	Number of hours in a year						
Unlimited Annual Fuel Input (per boiler)	2	MMSCF/yr	(Maximum Fuel Input) * (Unlimited Annual Operation)						
Annual Limit	none								
Fuel Heat Value	1000	btu/scf	Assumption						
Number of Boilers	2								
Criteria Pollutants									
Pollutant	CAS	Emission Factor		Unlimited Emission Rate (lb/hr-boiler)	Unlimited Emission Rate (tpy per boiler)	Limited Emission Rate Each Boiler (tpy)	Unlimited Emission Rate All Boilers (tpy)	Limited Emission Rate All Boilers (tpy)	NOTES
PM		7.60	lb/MMSCF	0.002	0.01	0.01	0.01	0.01	A
PM10		7.60	lb/MMSCF	0.002	0.01	0.01	0.01	0.01	A
PM2.5		7.60	lb/MMSCF	0.002	0.01	0.01	0.01	0.01	A
SO <sub>2</sub>		0.60	lb/MMSCF	0.000	0.001	0.00	0.00	0.00	A
NO <sub>x</sub>		100.00	lb/MMSCF	0.020	0.09	0.09	0.17	0.17	B
VOC		5.50	lb/MMSCF	0.001	0.00	0.00	0.01	0.01	A
CO		84.00	lb/MMSCF	0.017	0.07	0.07	0.15	0.15	B
Greenhouse Gas (CO <sub>2</sub> e)				24	105	105	210	210	G
CO <sub>2</sub>		120161	lb/MMSCF	24	105	105	209	209	E
CH <sub>4</sub>		2.27E+00	lb/MMSCF	4.51E-04	1.98E-03	1.98E-03	3.95E-03	3.95E-03	F
N <sub>2</sub> O		2.27E-01	lb/MMSCF	4.51E-05	1.98E-04	1.98E-04	3.95E-04	3.95E-04	F

## NOTES

- A AP-42 Table 1.4-2  
 B AP-42 Table 1.4-1  
 C AP-42 Table 1.4-3  
 D AP-42 Table 1.4-4  
 E 40 CFR Part 98 Table C-1: Pipeline natural gas = 1028 btu/scf, CO<sub>2</sub> emission = 53.02 kg CO<sub>2</sub>/mmBtu = 120162 lb/MMscf  
 F 40 CFR Part 98 Table C-2: Pipeline natural gas = 1028 btu/scf, CH<sub>4</sub> = 0.001 kg CH<sub>4</sub>/mmBtu, N<sub>2</sub>O = 0.0001 kg N<sub>2</sub>O / mmBtu  
 G CO<sub>2</sub>e = (Global Warming Potential, GWP) \* (Emission). GWP from 40 CFR Part 98 Table A-1. CO<sub>2</sub> = 1, CH<sub>4</sub> = 21, N<sub>2</sub>O = 310

## FIGURES





#### REFERENCE

Background Image: MN DNR Data Deli FSA Photo

0 0.5 1 2 Kilometers



DATE	JAN 12, 2011
DESIGN	RCB
GIS	RCB

TITLE

## SITE LOCATION

PROJECT No. 103-81295

CHECK

PROJECT Abbott Northwestern Hospital  
800 28th Street East, Minneapolis, MN

SCALE As Indicated

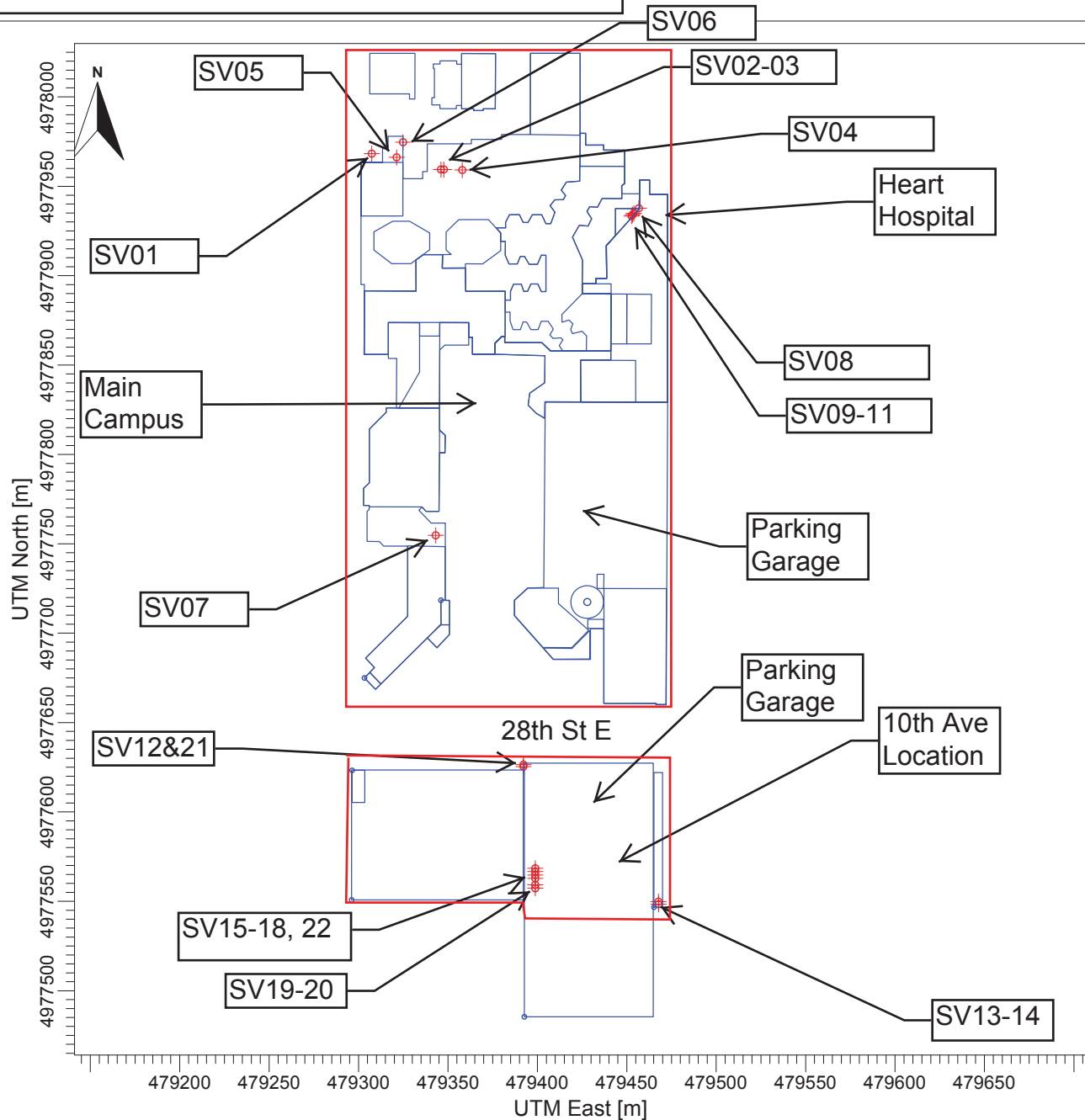
REV. 0

REVIEW

FIGURE: 1



**FIGURE 2A - STACK LAYOUT**  
 Facility ID 05300061 - Abbott Northwestern Hospital





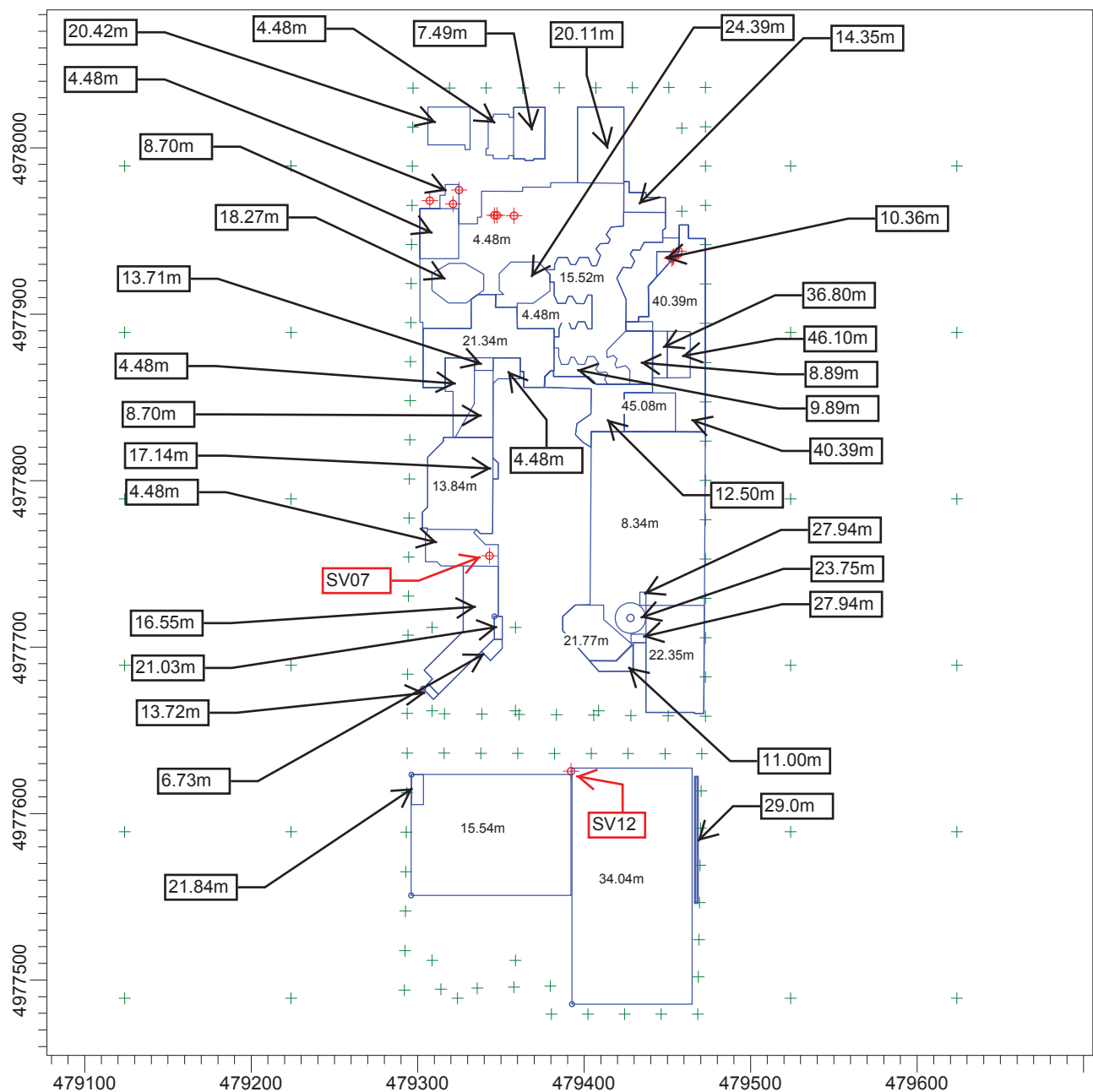
<b>COMMENTS:</b>  Datum: UTM NAD83 Zone 15N Blue outlines represent building tiers Red crosses represent emission points.	<b>SOURCES:</b>  <b>21</b>	<b>COMPANY NAME:</b>  <b>GOLDER ASSOCIATES</b>	
	<b>RECEPTORS:</b>  <b>1430</b>	<b>MODELER:</b>  <b>Ryan Birkenholz</b>	
		<b>SCALE:</b> 1:3,557  0  0.1 km	
		<b>DATE:</b>  <b>5/25/2011</b>	<b>PROJECT NO.:</b>  <b>103-81295</b>



FIGURE 2B - BUILDING ROOF HEIGHTS  
Facility ID 05300061 - Abbott Northwestern Hospital



COMMENTS:

Green Crosses = Receptors  
Red Circles = Point Sources  
Blue Structures = Buildings  
Coordinate System = UTM  
NAD83, Zone 15N

SOURCES:

**12**


---

RECEPTORS:

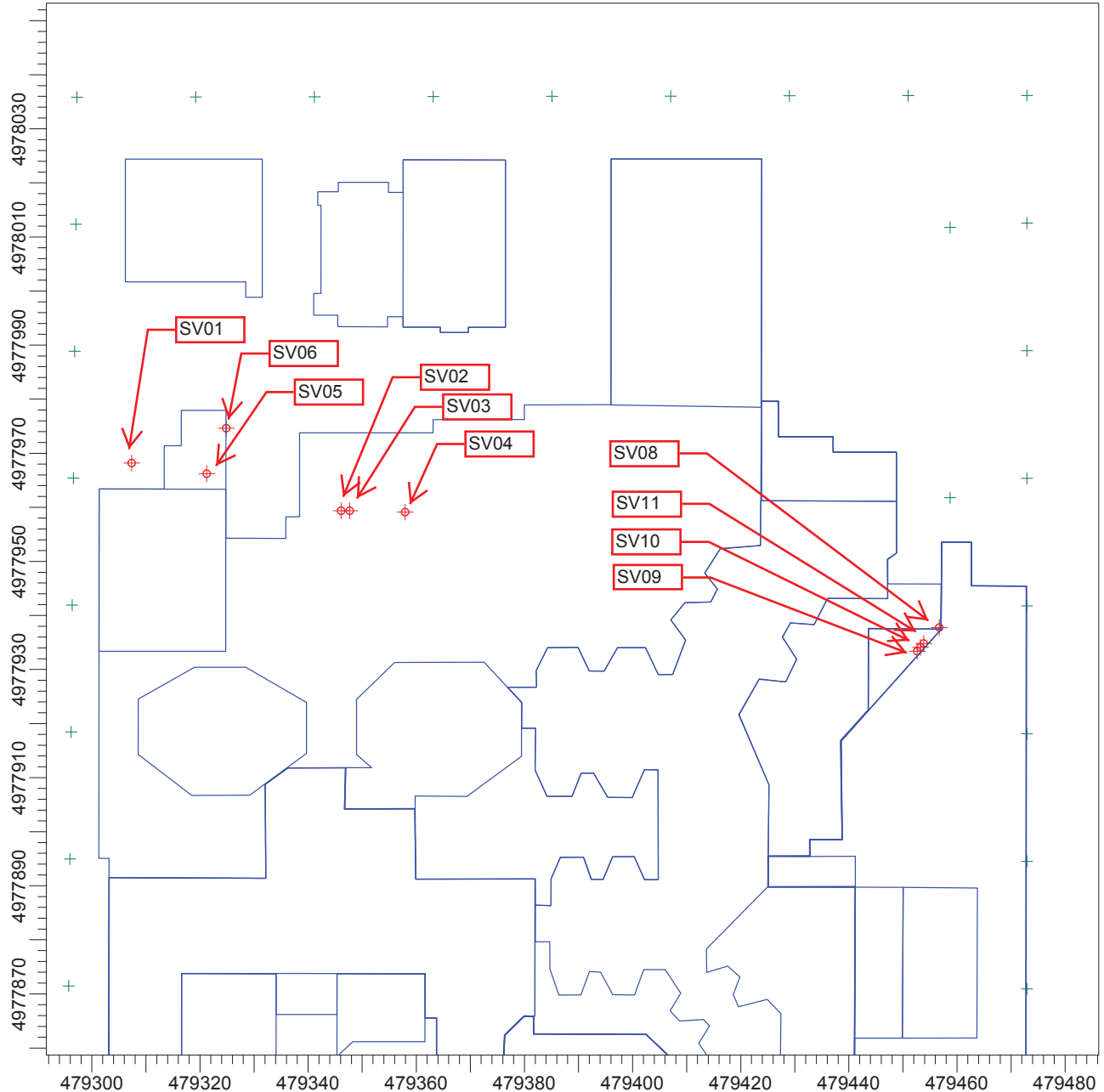
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COMPANY NAME:	
<b>Golder Associates Inc.</b>	
MODELER:	
<b>Ryan Birkenholz</b>	
SCALE:	1:3,834
	
DATE:	
<b>3/17/2009</b>	

**FIGURE 2C - STACK LAYOUT**  
**Facility ID 05300061 - Abbott Northwestern Hospital**



**COMMENTS:**

Green Crosses = Receptors  
 Red Circles = Point Sources  
 Blue Structures = Buildings  
 Coordinate System = UTM  
 NAD83, Zone 15N

**SOURCES:**

**12**

**RECEPTORS:**

**COMPANY NAME:**

**Golder Associates Inc.**

**MODELER:**

**Ryan Birkenholz**

**SCALE:**

**1:1,188**

0  0.04 km

**DATE:**

**3/17/2009**

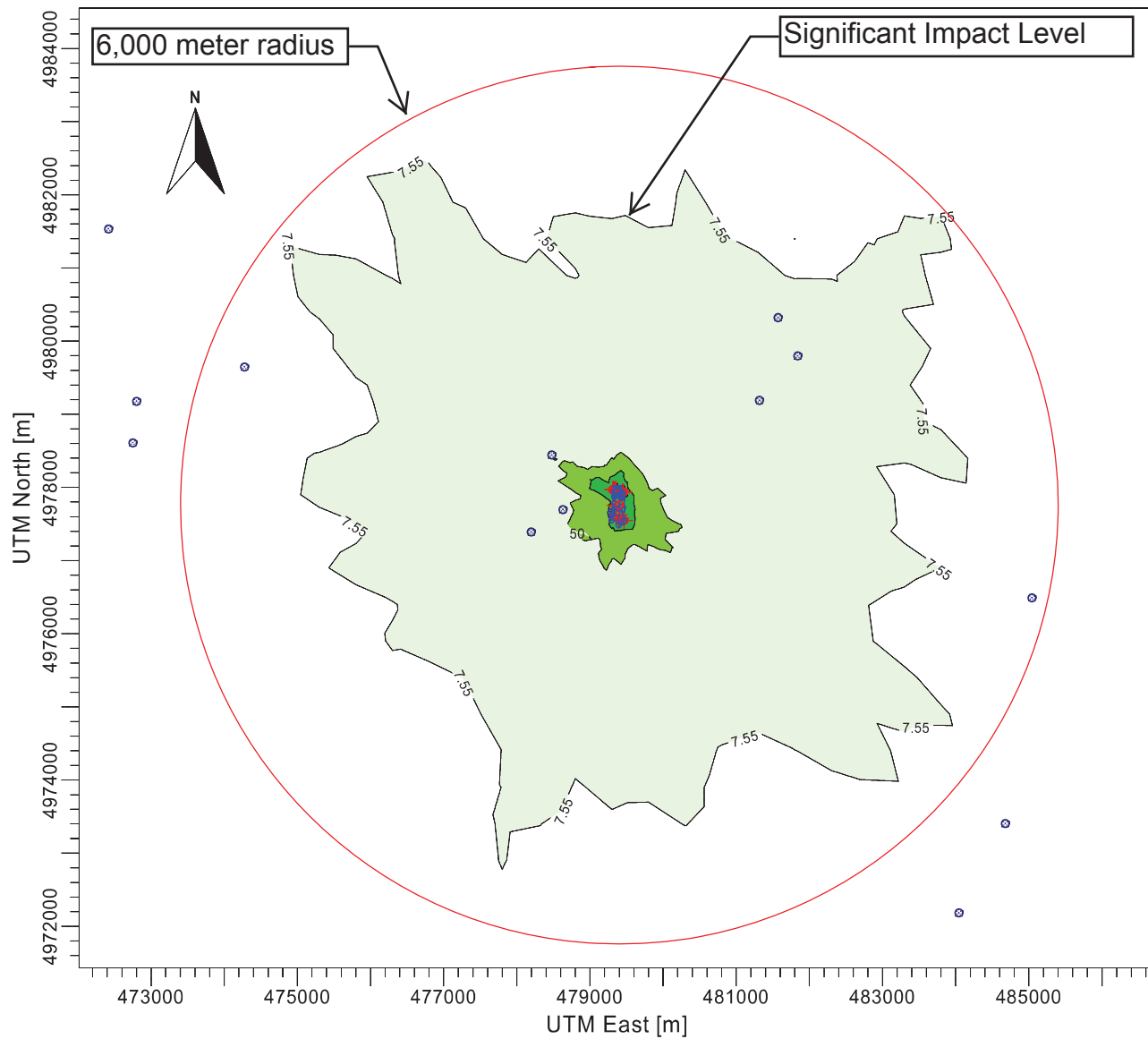
**PROJECT NO.:**

**083-81318**

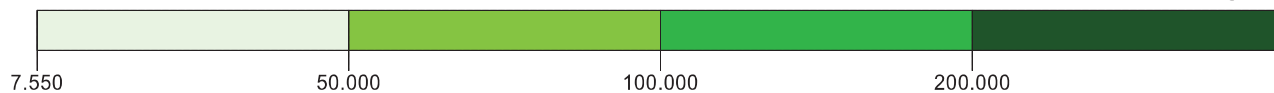


PROJECT TITLE:

**FIGURE 3 - Significant Impact Analysis (Hospital Sources)**  
**Nitrogen Dioxide 5 year Average Maximum Daily 1-HR Impact**



PLOT FILE OF 1ST-HIGHEST MAX DAILY 1-HR VALUES AVERAGED OVER 5 YEARS FOR SOURCE GROUP: ABBOTT ug/m<sup>3</sup>



COMMENTS:

SOURCES:

**70**

COMPANY NAME:

**Golder Associates Inc.**

RECEPTORS:

**242**

MODELER:

**Ryan Birkenholz, PE**

OUTPUT TYPE:

**Concentration**

SCALE:

1:92,436

0 3 km



MAX:

**373.07915 ug/m<sup>3</sup>**

DATE:

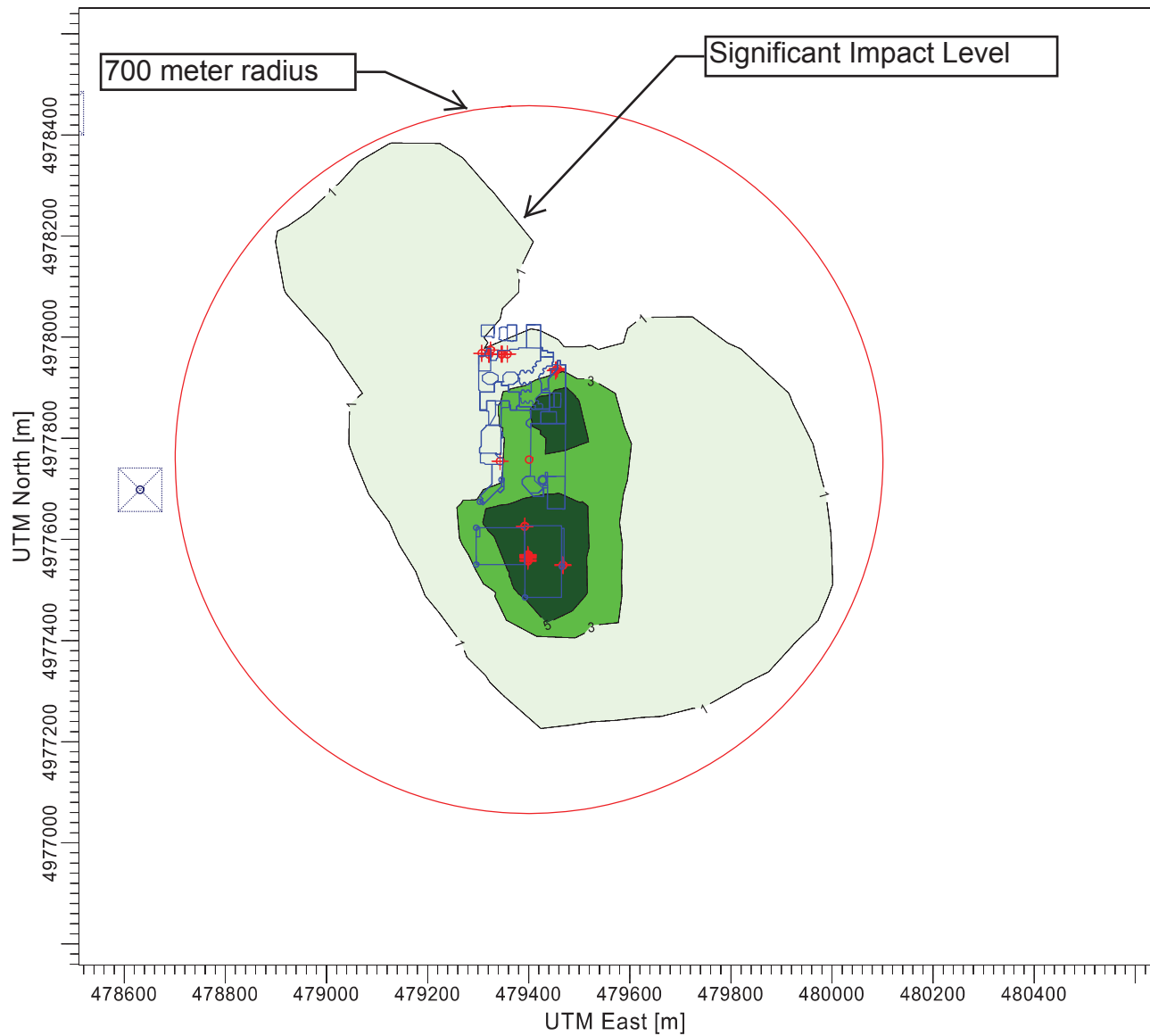
**11/8/2011**

PROJECT NO.:

**103-81295**

PROJECT TITLE:

**FIGURE 4 - Significant Impact Analysis (Hospital Sources)**  
**Nitrogen Dioxide 5 YR Average**



PLOT FILE OF PERIOD VALUES FOR SOURCE GROUP: ABBOTT

ug/m<sup>3</sup>



COMMENTS:

SOURCES:

**69**

COMPANY NAME:

**Golder Associates Inc.**

RECEPTORS:

**242**

MODELER:

**Ryan Birkenholz, PE**

OUTPUT TYPE:

**Concentration**

SCALE:

1:13,336

0 0.4 km



MAX:

**9.4854 ug/m<sup>3</sup>**

DATE:

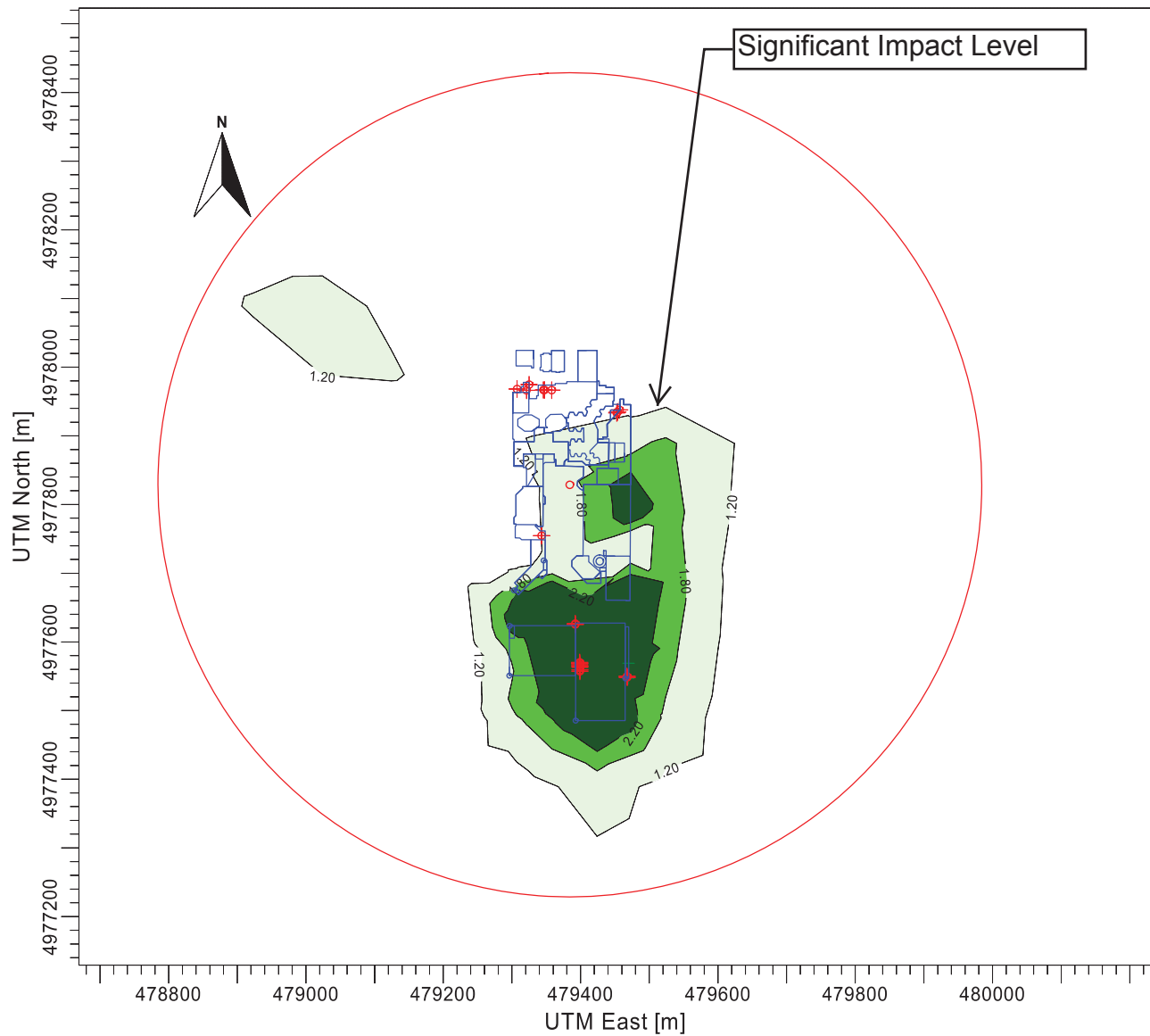
**11/8/2011**

PROJECT NO.:

**103-81295**


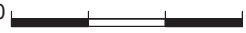
PROJECT TITLE:

**FIGURE 5 - Significant Impact Analysis (Hospital Sources)**  
**PM2.5 - 1ST HIGH MAX DAILY IMPACT AVERAGED OVER 5 YEARS**



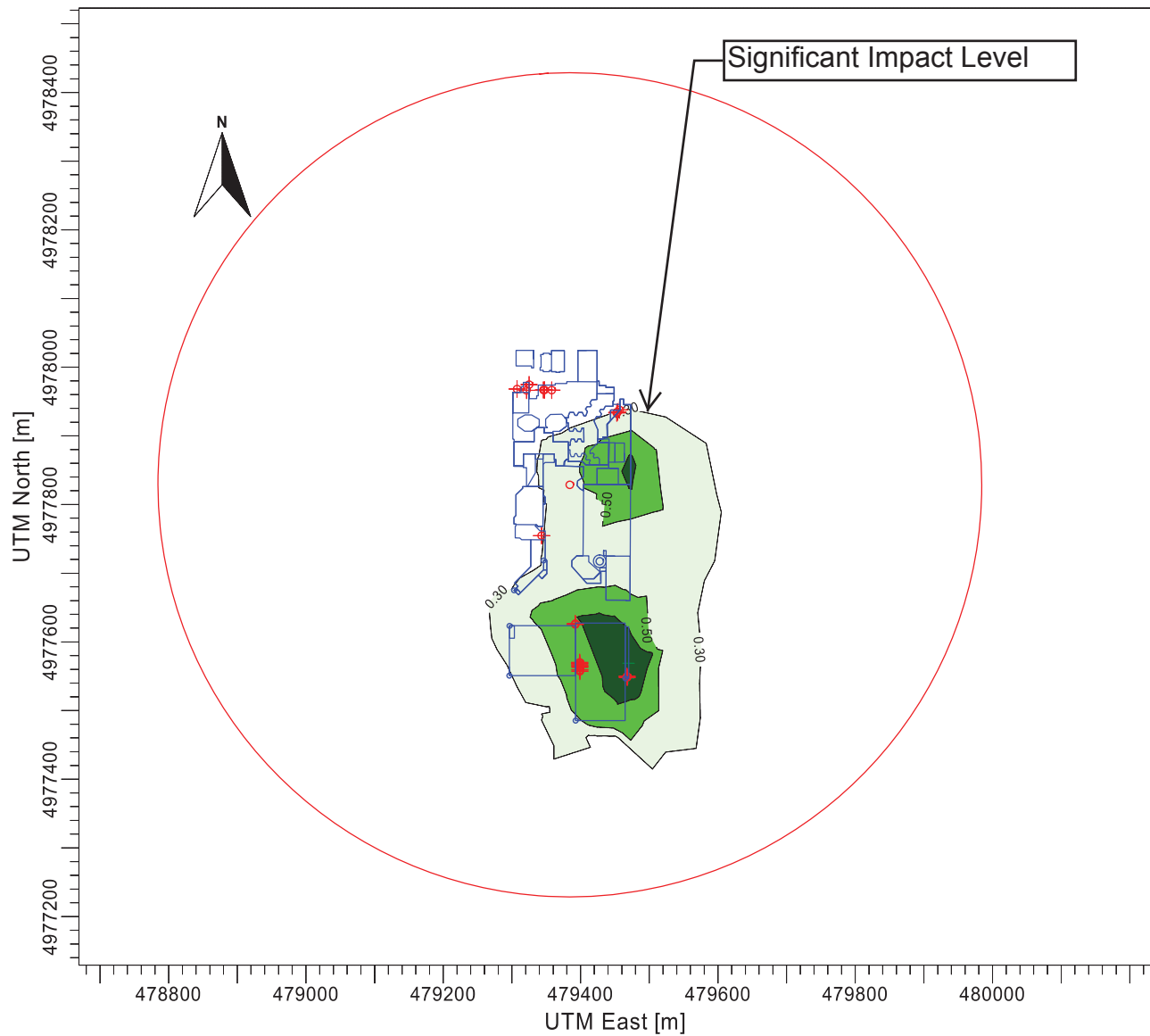
PLOT FILE OF 1ST-HIGHEST MAX DAILY 24-HR VALUES AVERAGED OVER 5 YEARS FOR SOURCE GROUP: ABBOTT ug/m<sup>3</sup>



COMMENTS:	SOURCES: <b>22</b>	COMPANY NAME: <b>Golder Associates Inc.</b>	
	RECEPTORS: <b>10</b>	MODELER: <b>Ryan Birkenholz, PE</b>	
	OUTPUT TYPE: <b>Concentration</b>	SCALE: 1:9,820 0  0.3 km	
	MAX: <b>3.26742 ug/m<sup>3</sup></b>	DATE: <b>11/30/2011</b>	PROJECT NO.: <b>103-81295</b>

PROJECT TITLE:

**FIGURE 6 - Significant Impact Analysis (Hospital Sources)**  
**PM2.5 - 5 year Average Impact**



PLOT FILE OF ANNUAL VALUES FOR SOURCE GROUP: ABBOTT

ug/m<sup>3</sup>



COMMENTS:

SOURCES:

**22**

COMPANY NAME:

**Golder Associates Inc.**

RECEPTORS:

**10**

MODELER:

**Ryan Birkenholz, PE**

OUTPUT TYPE:

**Concentration**

SCALE:

1:9,820

0  0.3 km



MAX:

**0.84617 ug/m<sup>3</sup>**

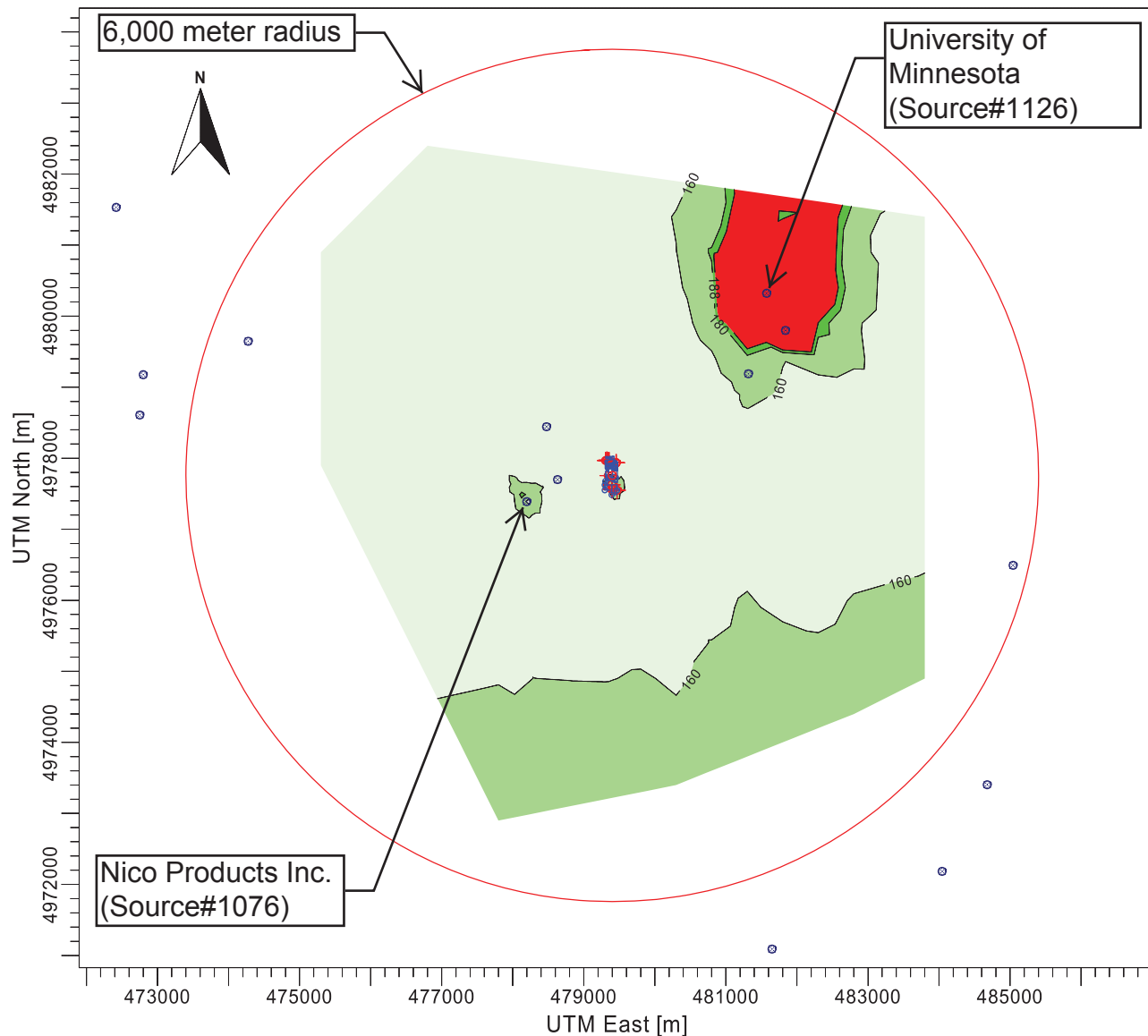
DATE:

**11/30/2011**

PROJECT NO.:


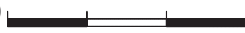
**103-81295**

PROJECT TITLE:  
**FIGURE 7 - NAAQS Analysis (All Sources + Background)**  
**Nitrogen Dioxide (Design Value)**

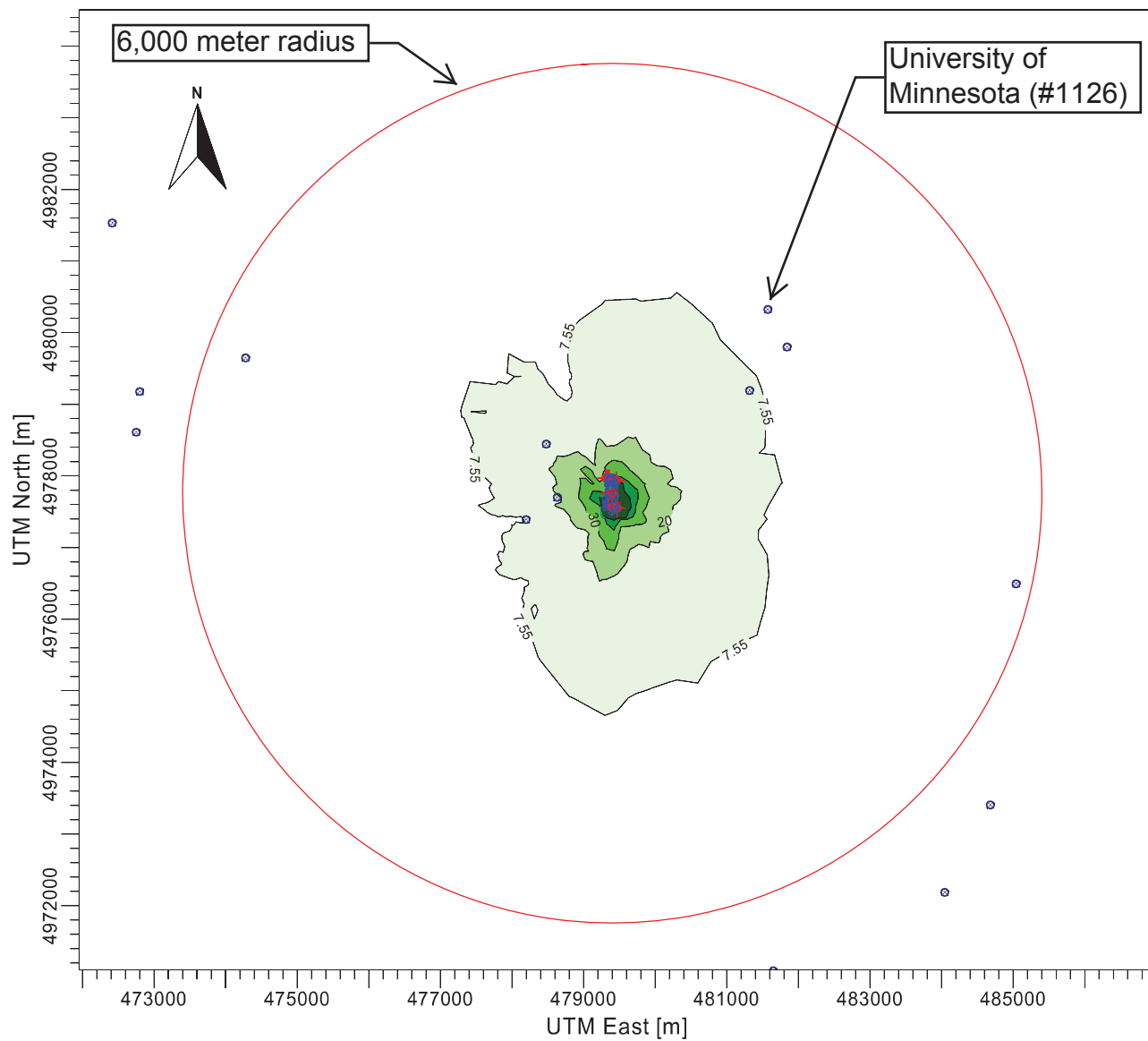


PLOT FILE OF 8TH-HIGHEST MAX DAILY 1-HR VALUES AVERAGED OVER 5 YEARS FOR SOURCE GROUP: ALL ug/m<sup>3</sup>





<b>COMMENTS:</b>  Design Value is the 5 year average of the 98th percentile of daily maximum 1-hr averages.	<b>SOURCES:</b>  <b>69</b>	<b>COMPANY NAME:</b>  <b>Golder Associates Inc.</b>	
	<b>RECEPTORS:</b>  <b>242</b>	<b>MODELER:</b>  <b>Ryan Birkenholz, PE</b>	
	<b>OUTPUT TYPE:</b>  <b>Concentration</b>	<b>SCALE:</b> 1:95,177  0  3 km	
	<b>MAX:</b>  <b>442.13496 ug/m<sup>3</sup></b>	<b>DATE:</b>  <b>11/9/2011</b>	<b>PROJECT NO.:</b>  <b>103-81295</b>

PROJECT TITLE:  
**FIGURE 7 - NAAQS Analysis (Hospital Sources Only)**  
**Nitrogen Dioxide (Design Value)**



PLOT FILE OF 8TH-HIGHEST MAX DAILY 1-HR VALUES AVERAGED OVER 5 YEARS FOR SOURCE GROUP: ABBOTT ug/m<sup>3</sup>

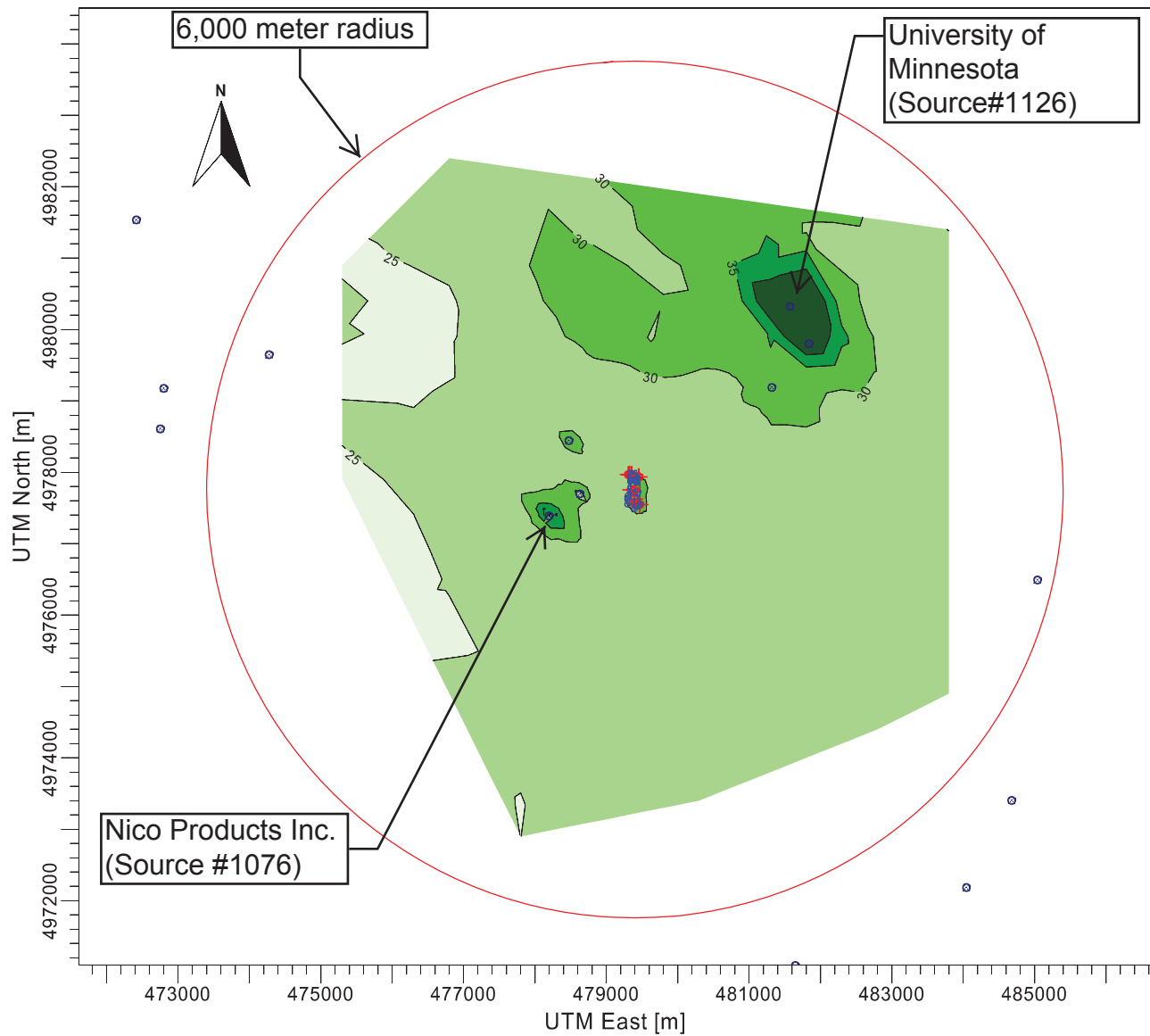


<b>COMMENTS:</b> Design Value is the 5 year average of the 98th percentile of daily maximum 1-hr averages.	<b>SOURCES:</b> <b>69</b>	<b>COMPANY NAME:</b> <b>Golder Associates Inc.</b>	
	<b>RECEPTORS:</b> <b>242</b>	<b>MODELER:</b> <b>Ryan Birkenholz, PE</b>	
	<b>OUTPUT TYPE:</b> <b>Concentration</b>	<b>SCALE:</b> 1:94,430 0  3 km	
	<b>MAX:</b> <b>100.34864 ug/m<sup>3</sup></b>	<b>DATE:</b> <b>11/8/2011</b>	<b>PROJECT NO.:</b> <b>103-81295</b>



PROJECT TITLE:

**FIGURE 9 - NAAQS Analysis (Hospital Sources)  
Nitrogen Dioxide 5- Year Average**



PLOT FILE OF PERIOD VALUES FOR SOURCE GROUP: ALL

ug/m<sup>3</sup>



COMMENTS:

SOURCES:

**69**

COMPANY NAME:

**Golder Associates Inc.**

RECEPTORS:

**242**

MODELER:

**Ryan Birkenholz, PE**

OUTPUT TYPE:

**Concentration**

SCALE:

1:94,442

0 3 km



MAX:

**48.77971 ug/m<sup>3</sup>**

DATE:

**11/8/2011**

PROJECT NO.:

**103-81295**

## **APPENDIX A**

### **ELECTRONIC SUBMITTAL SUBMITTED ON ENCLOSED COMPACT DISK**

- BPIP INPUT/OUTPUT FILES
- MET DATA FILES
- RECEPTOR GRIDS
- DIGITAL ELEVATION DATA
- AERMOD INPUT/OUTPUT FILES
- SEE DIRECTORY LISTING ON SUBMITTAL

**APPENDIX B**  
**MODELING PROTOCOL AND SUBSEQUENT COMMUNICATION**



**Minnesota Pollution  
Control Agency**

520 Lafayette Road North  
St. Paul, MN 55155-4194

**AQDMPRF-01**

**Air Quality Dispersion Modeling PROTOCOL**

**Review Form:**

Internal Protocol Review Form for Criteria Pollutant Modeling

Publication Document # \_\_\_\_\_

Today's Date: **10/06/2011**

MPCA Air Dispersion **Greg Pratt**

Modeler:

AQ File No.: **253**

Three-letter Modeling Facility ID (ex., ACE, XAK, MEC, NUP, etc.):

Facility Name: **Abbott Northwestern Hospital**

Date protocol was received at the MPCA: **09/02/2011**

Project Name:

Today's Date:

MPCA Air Permit

Engineer:

AQ Facility ID No.:

**pending**

**Sarah Sevcik**

**05300061**

**ANW**

Approval of Modeling Protocol by Sections – Air Dispersion Modeler		
Section and Section Name	Acceptable / Unacceptable	Deficiencies and/or Comments
Files to Accompany Protocol	Unacceptable	The accompanying model input files do not indicate how emissions will be considered for the peak shaving and emergency generators. It is possible that the emergency generators may not need to be modeled, but there is concern that operating them on a testing schedule may in itself cause an exceedance of the 1-hour NO <sub>2</sub> standard. This concern needs to be addressed so that these sources can be excluded from the analysis with confidence or so that they are included in a way that represents their reasonable mode of operation. I have sent updated, meteorological, background and related (*.far) files electronically for use in the analysis
Section A <i>Purpose for Air Dispersion Modeling and Related Information</i>	Acceptable	No comments on this section
Section B <i>EPA Pre-Processors and EPA Post-Processors</i>	Acceptable	No comments on this section
Section C <i>Model Selection and Options (Key CO Pathway Inputs)</i>	Acceptable	No comments on this section
Section D <i>Emission Source Characterizations and Parameters (Key SO Pathway Inputs)</i>	Acceptable	No comments on this section
Section E <i>Paved Roads Fugitive Dust</i>	Acceptable	No comments on this section
Section F <i>Receptors (RE Pathway)</i>	Unacceptable	Flagpole receptors should be added at the locations of the hospital air intakes.
Section G <i>Meteorological Data (ME Pathway)</i>	Acceptable	The consultant was supplied with a data packet that contains 2006-2010 met data (in contrast to the 2004-2008 data indicated in the protocol).
Section H <i>SIL Analysis and Results</i>	Acceptable	No comments on this section



Section I <i>Background Values</i>	Unacceptable	The FAR approach using hourly background files and nearby sources explicitly modeled as volume sources is recommended. A data packet containing these inputs was provided.
Section J <i>Nearby Sources</i>	Unacceptable	The FAR approach using hourly background files and nearby sources explicitly modeled as volume sources is recommended. A data packet containing these inputs was provided.
Section K <i>Anticipated Outputs (OU Pathway)</i>	N/A	This section was not included in the version of the protocol form used in the submittal. Based upon the model input files that were included, the proposed outputs appear to be acceptable.
AQDMPS-01 Form	Acceptable	No comments on this section
Modeling Protocol Is:	NOT APPROVED; See comments and revise accordingly	

Approval of Modeling Protocol by Sections – Air Permit Engineer		
Section and Section Name	Acceptable / Unacceptable	Deficiencies and/or Comments
Section D <i>Emission Source Characterizations and Parameters (Key SO Pathway Inputs)</i>	(Select from list)	No comments on this section
Section E <i>Paved Roads Fugitive Dust</i>	(Select from list)	No comments on this section
AQDMPS-01 Form	(Select from list)	No comments on this section
Comments on other sections:		No other comments on protocol
Modeling Protocol Is:	(Select from list)	



**Minnesota Pollution  
Control Agency**

520 Lafayette Road North  
St. Paul, MN 55155-4194

# AQDMP-01

## Air Quality Dispersion Modeling (AQDM) Protocol Protocol Form for Criteria Pollutant Modeling

Doc Type: Air Dispersion Modeling

### Guidance Information on Page 12

**Instructions:** Permit applicants required to conduct air dispersion modeling should submit two paper copies of the completed Air Quality Dispersion Modeling Protocol form (AQDMP-01), the Air Quality Dispersion Modeling Protocol Spreadsheet (AQDMPS-01), and all accompanying files to:

Air Quality Permit Document Coordinator  
Minnesota Pollution Control Agency  
520 Lafayette Road North  
St. Paul, MN 55155-4194

Applicants may also submit an electronic version in addition to the two paper copies.

Electronic copies of the forms and accompanying files should be sent to: [AirModeling.PCA@state.mn.us](mailto:AirModeling.PCA@state.mn.us).

### Facility Information

AQ file no.: 253 AQ facility ID no.: 05300061 Today's date (mm/dd/yyyy): 8/29/2011  
Three-letter modeling facility ID (ex., ACE, XAK, MEC, NUP, etc.): ANW  
Facility name: Abbott Northwestern Hospital  
Facility street address: 800 28<sup>th</sup> Street South  
City: Minneapolis State: MN Zip code: 55407  
Phone: 612-863-4164 Fax: 612-863-3123 E-mail: tim.grote@allina.com  
Facility contact: Mr. Timothy B. Grote Protocol prepared by: Mr. Ryan Birkenholz  
Contact phone: 612-863-4164 Contact e-mail address: tim.grote@allina.com  
County: Hennepin Elevation at facility: 262.1 m  
Latitude, Longitude of facility (Dec. degrees): 44.953177 N, 93.261375 W and UTM coordinates, (NAD83, zone 15 extended): x= 479,383.00 m, y= 4977783 m

### Files to accompany protocol

Use the checkboxes to indicate that the following **required** files are included with the completed protocol form.  
Please do not use spaces or special characters in the file names or pathways.

- ☒ 1. Sample AERMOD input files for **each** modeled criteria pollutant (\*.inp, \*.adi, \*.ami)  
**\*Note:** Input file should include receptor grid and building downwash (if applicable)
- ☒ 2. BPIPPRM input file (\*.bpi)
- ☒ 3. Elevation files for input into AERMAP (\*.tif (NED files), \*.dem(s))
- ☒ 4. Background data files with concentrations for each applicable pollutant (annual, seasonal, monthly, daily, etc.)
- ☒ 5. AQDMPS-01 spreadsheet
- ☒ 6. **Optional**, but recommended, files and supporting documents (ex., SAM and/or SMS Spreadsheets, images, figures, SIL analysis modeling output files, etc.) – Please list:  
Attached air modeling protocol text/figures/supporting information.

## Section A. Purpose for Air Dispersion Modeling and Related Information

1. What is the purpose for conducting the ambient air dispersion modeling (check all that apply)?  
☐ Permit requirement ☐ EAW ☐ EIS ☐ SIP ☐ PSD  
☒ Other – please explain: Cumulative Levels and Effects Analysis
2. What type of air emission permit does this facility currently hold?  
☐ No current permit ☐ Federal (Title V/Part 70) ☒ State ☐ State Registration ☐ Capped ☐ General  
☐ Other: \_\_\_\_\_
3. Will you be applying for a permit or a permit amendment for the project? ☒ Yes ☐ No
4. In 50 words or less, please provide a description of the proposed project:  
Switch backup fuel for GP001 boilers from #6 fuel oil to #2 fuel oil and add new emission units.
5. Is the proposed project subject to PSD? ☐ Yes ☒ No
  - a. If yes, list pollutants: \_\_\_\_\_
  - b. Is this facility considered a major source for PSD: ☐ Yes ☒ No
6. Has the PSD minor source baseline been set for: Hennepin County? ☐ Yes ☐ No
  - a. If yes, for which pollutant(s) and the year(s) it was set (check all that apply)?  
☐ NO<sub>2</sub> \_\_\_\_\_ PM<sub>10</sub> \_\_\_\_\_ PM<sub>2.5</sub> \_\_\_\_\_ ☐ SO<sub>2</sub> \_\_\_\_\_  
PSD major source baseline (*PM<sub>2.5</sub> trigger date will be on Oct. 20, 2011, 1 year after F.R. publication date.*)  
☒ NO<sub>2</sub> 1988 ☒ PM<sub>10</sub> 1975 ☒ PM<sub>2.5</sub> 2010 ☒ SO<sub>2</sub> 1975
7. What type of analysis will be conducted (check all that apply)?  
☒ NAAQS/MAAQS ☐ PSD Class II Increments ☐ PSD Class I Increments ☒ SIL Analysis ☐ Screening  
☒ Other: Air Toxics Analysis using Q/CHI method
8. Was MPCA air dispersion modeling staff consulted while completing this form? ☐ Yes ☒ No
  - a. If yes, please list consultation information:

MPCA staff name: _____	DQ or tracking no: _____	Date of consultation (mm/dd/yyyy): _____
Topic of consultation: _____		
9. Additional information for this section (if not applicable, place N/A in field):  
N/A

## Section B. EPA Pre-Processors and EPA Post-Processors

1. Will AERMAP be used? ☒ Yes ☐ No  
If no, please explain: \_\_\_\_\_
  2. What version of AERMAP is proposed to be used: AERMAP version 11103
    - a. If other, please explain: \_\_\_\_\_
    - b. What type of elevation data will be used:  
☐ NED 1/3 arc second ☒ NED 1 arc second ☐ DEM 7.5 min ☐ DEM 1.0 degree  
☐ Other - Please describe: \_\_\_\_\_
- All UTM coordinates must be in NAD83, Zone 15 Extended (not NAD27).*

3. Will BPIP-PRIME version 04274 be used? ☒ Yes ☐ No

If no, please explain: \_\_\_\_\_

*Tiering of buildings must follow MPCA's modeling guidance from section 6 of the Oct. 2004 "MPCA Air Dispersion Modeling Guidance For Minnesota Title V Modeling Requirements And Federal Prevention of Significant Deterioration (PSD) Requirements (Version 2.2)."*

4. Will MPCA pre-processed AERMET data be used? ☒ Yes ☐ No If no, proceed to question 5.

**Note** – MPCA's pre-processed meteorological data with AERMET incorporates the following details:

- AERSURFACE version 08009 is used to determine surface characteristics using 1992 LULC data.
- Yearly-averaged moisture conditions (wet, dry, or average) based on historical ranks are accounted for in AERSURFACE to aid in the determination of Bowen ratio values.
- Default 1.0 km radius for surface roughness and 10 km by 10 km domain for albedo and Bowen ratio used in AERSURFACE

- a. If **no**, will on-site meteorological data be processed and used? ☐ Yes ☐ No

*If no to question 4a, skip to question 5 and provide additional information in question 6.*

- b. If **yes** to question 4a, please answer the following questions. Otherwise, please move on to question 5.

- i. Will AERSURFACE be used to determine surface characteristics around the meteorological tower? (Default is "Yes") ☐ Yes ☐ No

ii. What version of AERSURFACE is proposed to be used: (Select from list)

iii. What LULC data will be used? (Select from list)

If other, please explain: \_\_\_\_\_

- iv. Will yearly-averaged moisture conditions (wet, dry, or average) based on historical ranks be accounted for in AERSURFACE (for the Bowen Ratio)? (Default is "Yes") ☐ Yes ☐ No

- v. Will the default 1.0 km radius for surface roughness, and 10 km by 10 km domain for albedo and Bowen ratio be used? (Default is "Yes") ☐ Yes ☐ No

If no, please explain: \_\_\_\_\_

5. Are any **EPA** post-processors (such as LEADPOST) proposed to be used in the analysis? ☐ Yes ☒ No

- a. If yes, what post-processor(s) and version(s): \_\_\_\_\_

6. Additional information for this section (if not applicable, place N/A in field):

N/A

## Section C. Model Selection and Options (Key CO Pathway Inputs)

1. Identify the air dispersion model and version proposed to be used in the analysis: AERMOD version 11103

a. If other, please list: \_\_\_\_\_

2. Will alternative air dispersion models and/or methods, as specified by Appendix W, be applied (e.g., parallel version(s) of model, PVMRM/OLM, secondary formation, etc.)? ☒ Yes ☐ No

If yes, please explain: PVMRM is proposed for use with this project

- a. If yes, will approval be required by MPCA and/or EPA Region V air modeling staff? ☒ Yes ☐ No

If yes, please select: ☒ MPCA (State-only action) ☐ EPA Region V (PSD/SIP action)

If no, please explain: \_\_\_\_\_

3. What criteria pollutants are required to and will be modeled (check all that apply)?

☒ CO ☒ NO<sub>2</sub> ☒ PM<sub>2.5</sub> ☒ PM<sub>10</sub> ☒ SO<sub>2</sub> ☐ Pb ☐ H<sub>2</sub>S ☐ Other: \_\_\_\_\_

*Please refer to **table A.1 and A.2 in the appendix** for averaging times and form of standard for each criteria pollutant(s). Refer to the most recent version of the EPA's AERMOD User's Guide for correct pollutant IDs to use. Use EPA's most recent modeling guidance' methods for PM<sub>2.5</sub>.*

4. What model options are proposed to be used in the analysis for the source under review (check all that apply)?



☒ Regulatory Default - list pollutants: CO, PM2.5, PM10, SO2 ☒ Non-Regulatory Default - List pollutants: NO2  
☐ Concentration ☐ Rural ☒ Urban ☐ Other: \_\_\_\_\_

- a. If Urban, please specify population area, population, and surface roughness radius:  
Population area: Minneapolis Population: 385,378 Surface roughness radius: 1.0 km
- b. If Non-Regulatory Default, please specify non-default options: PVMRM

5. If NO<sub>2</sub> is required to be analyzed for the 1-hour and annual NAAQS, what tier methodology(s) is proposed?

- ☐ N/A, NO<sub>2</sub> not required (skip to question 6)  
☐ Tier 1 (100% NO<sub>x</sub> to NO<sub>2</sub> conversion, most conservative)  
☒ Tier 2 (Default ambient ratio of 0.80, or an appropriate ratio value)  
☐ Tier 3 (OLM, requires justification and approval by MPCA and/or EPA Region 5)  
☒ Tier 3 (PVMRM, requires justification and approval by MPCA and/or EPA Region 5)

- a. If Tier 2, please provide the ambient ratio proposed (default = 0.80): 0.80
- b. If Tier 3 is anticipated to demonstrate compliance in the modeling analysis (OLM or PVMRM), please provide the following details now to expedite MPCA's review:  
In-stack ratio of NO<sub>2</sub>/NO<sub>x</sub> (NO2STACK) (default=0.50): 0.50  
Equilibrium ratio (NO2EQUIL) (default=0.90): 0.90

Ozone (Please select option(s)):

- ☐ Monitored Value (OZONEVAL): \_\_\_\_\_ Units (OZONUNIT): ug/m^3  
☐ MPCA-generated Inverse-Distance Weighted Hourly O<sub>3</sub> File (µg/m<sup>3</sup>) (OZONEFIL)  
☐ File name: \_\_\_\_\_ DMAX: km  
☒ MPCA-generated Maximum Hourly Monitored O<sub>3</sub> File (µg/m<sup>3</sup>) (OZONEFIL)  
☒ File name: HourlyOzone.max DMAX: unknown km  
☐ Other - please explain: \_\_\_\_\_

c. Is EPA approval needed for the modeling protocol (e.g., Tier 3 NO<sub>2</sub>)? *Tier 3 NO<sub>2</sub> methodologies that require approval by Region 5 modeling staff need to have said approval before submission of this form.*

- ☐ Yes – PSD/SIP permit action ☒ No – State-only action

d. Are the following criteria from Appendix W, section 3.2.2, paragraph (e) met in this protocol?

- e. *“Finally, for condition (3) in paragraph (b) of this subsection...an alternative refined model may be used provided that:*
- The model has received a scientific peer review;*
  - The model can be demonstrated to be applicable to the problem on a theoretical basis;*
  - The data bases which are necessary to perform the analysis are available and adequate;*
  - Appropriate performance evaluations of the model have shown that the model is not biased toward underestimates; and*
  - A protocol on methods and procedures to be followed has been established.”* ☒ Yes ☐ No

If no, please explain: \_\_\_\_\_

6. Additional information for this section (including justification for non-default or additional values listed in 5a or 5b):

Tier 2 will be used for the NO<sub>2</sub> model if possible, but Abbott requests to be allowed to use Tier 3 (PVMRM).

## Section D. Emission Source Characterizations and Parameters (Key SO Pathway Inputs)

Include and list the facility's modeling parameters for all source types in the MPCA's *Modeling Parameters Spreadsheet* (Form AQDMPS-01). For background sources listed within SO Pathway, please see Section I.

1. Please indicate which of the following source characterizations are present at your facility and will be included for modeling analysis (check all that apply):

“Yes” = Source-type present and will model; “N/A” = Source-type not present; “No” = Source-type present but will not model.

### Subsection I. Point sources:

☒ Yes ☐ N/A ☐ No please explain: \_\_\_\_\_

- a. Are any of the point sources capped and/or horizontal stacks (see guidance in section 6.1, AERMOD Implementation Guide (03/19/2009)) and accounted for in the following?

☐ No ☒ Yes – exit velocity(s) = 0.001 m/s ☐ Non-Default POINTCAP/POINTHOR\*

*\*Please provide justification for use of non-default option in question b, below.*

- b. Additional information for this subsection (if not applicable, place N/A in field):

SV06 is at a 45 degree angle, velocity will equal maximum velocity \* Sin(45°).

The emergency and peaking generators are limited to 300 hours per year. Based on guidance from EPA in a memo dated March 1, 2011, Abbott proposes to exclude the emissions from the generators in the models where the design value is probabilistic (1-hr NO<sub>2</sub>, 1-hr SO<sub>2</sub>). The memo states that emission scenarios should be limited to those that "can logically be assumed to be relatively continuous or which occur frequently enough to contribute significantly to the annual distribution of daily maximum 1-hr concentrations". From 2008 through 2010, all generators at Abbott have been operated an average of less than 24 hours per year (0.3% of the year).

**Subsection II. Volume sources:**

☐ Yes ☒ N/A ☐ No please explain: \_\_\_\_\_

Please refer to figure A.1 in the appendix on calculating the lateral and vertical dimensions.

- a. Will there be any volume source(s) overlapping or within 1.0 meters of any receptors?

☐ No ☐ Yes\*

*\*Volume source should be converted to an area source of commensurate size (per section 6.2 of the latest AERMOD Implementation Guide (03/19/2009)) or be further refined.*

- b. Additional information for this subsection (if not applicable, place N/A in field):

**Subsection III. Area sources (includes AREACIRC and AREAPOLY):**

☐ Yes ☒ N/A ☐ No please explain: \_\_\_\_\_

- a. Additional information for this subsection (if not applicable, place N/A in field):

**Subsection IV. Open pit sources:**

☐ Yes ☒ N/A ☐ No please explain: \_\_\_\_\_

- a. Additional information for this subsection (if not applicable, place N/A in field):

2. Are fugitive emissions emitted from the source and will they be accounted for in the modeling analysis?

*(Examples of fugitive emissions include but are not limited to: traffic on paved and/or unpaved roads, stockpiles of various materials, wind erosion, loadout, unloading, etc.)*

☐ Yes ☒ N/A ☐ No please explain: \_\_\_\_\_

- a. If yes, please list the facilities' fugitive sources: \_\_\_\_\_

*Note: If modeling for paved road fugitive dust, please read and complete Section E.*

- b. Will the Standardized Mobile Source (SMS) Spreadsheet be used to determine emissions due to paved and/or unpaved roads (unpaved spreadsheets under development)? ☐ Yes ☐ No

3. Will all insignificant activities emitted from the source for PM<sub>10</sub>, with emissions over 0.1 lb/hr and for PM<sub>2.5</sub>, with emissions over 0.02 lb/hr, be accounted for in the modeling?

☒ Yes ☐ N/A ☐ No please explain: \_\_\_\_\_

*\* Please provide justification for excluding any fugitive and/or insignificant activities within the modeling.*

*Please scale for other pollutants. For example, (0.1 lb/hr)/(150 µg/m<sup>3</sup>) = (X lb/hr)/(35 µg/m<sup>3</sup>), where X = 0.02 lb/hr.*

*Refer to guidance in section 10 of the Oct. 2004 "MPCA Air Dispersion Modeling Guidance For Minnesota Title V Modeling Requirements And Federal Prevention of Significant Deterioration (PSD) Requirements (Version 2.2)"*

4. Will all applicable PSD increment consuming and/or expanding sources be modeled for your source?

☐ Yes ☒ N/A ☐ No please explain: \_\_\_\_\_

5. Will emission factors/scalars be used to demonstrate compliance in the air dispersion modeling analysis? ☐ Yes ☒ No  
If yes to a., describe which sources and the types of emission factors/scalars that will be applied:
6. Will NO<sub>2</sub>/NO<sub>x</sub> ratios be provided, source-by-source, for OLM/PVMRM options? ☐ N/A ☐ Yes ☒ No
7. Will "OLMGROUP ALL" be used for OLM option? ☒ N/A ☐ Yes ☐ No
8. Additional information for this section (if not applicable, place N/A in field):

## Section E. Paved Roads Fugitive Dust (Optional)

Current MPCA policy regarding modeling of paved road fugitive dust emissions, in support of air quality permitting or environmental review, recommends that:

New facilities or facilities undergoing physical expansions will not be required to model paved road fugitive dust emissions if a facilities' predicted ambient impacts for PM<sub>10</sub> and PM<sub>2.5</sub> are less than a specified % of the NAAQS and/or PSD Class II Increment. This policy does not apply to modeling that supports permitting in maintenance areas or the development of State Implementation Plans. Exceptions to the policy can and will occur.

If paved road fugitive dust emissions are proposed to be included in your modeling analysis and you did **not** answer "No" to question 1b, MPCA guidance recommends that the source in question first model its' facility **without** including paved road fugitive dust emissions. Results then can be recorded using Table E-01 below for PM<sub>10</sub> and PM<sub>2.5</sub> (NAAQS modeling must include background concentrations).

1. Does your facility have paved road fugitive dust emissions for PM<sub>10</sub> and PM<sub>2.5</sub>?  
☐ Yes ☒ No – Please continue to the next section (F)
- a. Will your facility include paved road fugitive dust emissions for modeling? ☐ Yes ☐ No
- b. Is your facility either a new source or an existing facility undergoing a physical expansion?  
☐ New source ☐ Existing w/ phys. expan. ☐ No\*  
\*If no, please answer questions 2 – 4 only as necessary and then proceed to the next section.
- c. If yes to question 1 and no to question 1a, please provide justification for not including paved road fugitives:  
\_\_\_\_\_
2. How many vehicles per day drive on and off your facility's property?  
Employee traffic and parking: \_\_\_\_\_ Third-party truck traffic: \_\_\_\_\_
3. Will you be using the most recent version of the MPCA's Standardized Mobile Source (SMS) spreadsheet to determine paved road fugitive dust emissions and source parameters?  
☐ Yes\* ☐ No \*If yes, please submit SMS with this modeling protocol form and indicate on the cover page of this form.
4. Additional information for this section (if not applicable, place N/A in field):

**Note:** Modeling and completing the tables below are optional for this form. However, results must be provided with the modeling analysis results in the permit application, to support or not support the inclusion paved road fugitive dust sources in the analysis.

Table E-01

	Averaging Period	NAAQS (µg/m <sup>3</sup> )	Modeled NAAQS Impact Concentrations (µg/m <sup>3</sup> )	% of NAAQS	PSD Class II Increments (µg/m <sup>3</sup> )	Modeled Class II Increment Impact Concentrations (µg/m <sup>3</sup> )	% of Class II Increments
PM <sub>10</sub>	24-hour	150		0.00%	30		0.00%
	Annual	50		0.00%	17		0.00%
PM <sub>2.5</sub>	24-hour	35		0.00%	9		0.00%
	Annual	15		0.00%	4		0.00%

Table E-02 indicates the resultant category(s) for your facility, based on the % of the standard(s) for PM<sub>10</sub> and PM<sub>2.5</sub> (see results in columns “% of NAAQS” and “% of Class II Increments” in Table 1F-01 above). This uses the highest % from all averaging periods for each pollutant and standard. The category descriptions are provided in Table E-03. Answers to question 2 above will help determine permit conditions if modeled concentrations result in a category 2 designation.

**Table E-02**

	NAAQS	PSD Class II Increments						
	NAAQS Result(s) w/ Background	Cat. 1	Cat. 2	Cat. 3	PSD Class II Result(s)	Cat. 1	Cat. 2	Cat. 3
PM <sub>10</sub>	0.00	# < 60%	60% < # < 95%	95% < #	0.00	# < 35%	35% < # < 75%	75% < #
PM <sub>2.5</sub>	0.00	# < 80%	80% < # < 95%	95% < #	0.00	# < 40%	40% < # < 80%	80% < #

**Table E-03**

Cat 1:	Paved road fugitive emissions not required to be modeled, and no paved road fugitive dust permit conditions.
Cat 2:	Paved road fugitive emissions not required to be modeled, with paved road fugitive dust permit conditions determined by levels of traffic at the facility.
Cat 3:	Paved road fugitive emissions <b>are</b> required to be modeled, with site-specific paved road fugitive dust permit conditions. Re-modeling and/or addition of paved road fugitive emissions source group required.

## Section F. Receptors (RE Pathway)

Please refer to guidance from Table 4 and 5 of the October 2004 “MPCA Air Dispersion Modeling Guidance For Minnesota Title V Modeling Requirements And Federal Prevention of Significant Deterioration (PSD) Requirements (Version 2.2)”, as well as federal guidance.

- What type of receptor grid will be used? Discrete Cartesian
  - If other or a combination, please describe: \_\_\_\_\_
- How many # receptors in total will be in the receptor grid? unknown - as many as it takes to capture the SIL
- What will be the grid dimensions? (Ex., radius of 10 km, 5 km by 5 km, etc.) \_\_\_\_\_
- What is the proposed spacing of receptors for...?
  - Inside the property boundary(s): 50 meters
  - On the fenceline(s): N/A meters
  - On the property line(s): 25 meters
  - Beyond the property line(s): 100 to 2km 500 to 5km meters
- Will FLAGPOLE receptors be included in the receptor grid?  
☐ Yes ☐ N/A ☒ No – Please continue to the next section (F)
- Additional information for this section (if not applicable, place N/A in field): \_\_\_\_\_

## Section G. Meteorological Data (ME Pathway)

- What meteorological surface station is proposed for use? Please indicate the three letter call sign, station name and the state the surface station is located in. (Ex.: MSP: Minneapolis/St. Paul, MN)  
 Pre-processed AERMET version 06341 or earlier files: (Select from list, \*DLH-\*SXF)  
 Pre-processed AERMET version 11059, with or without AERMINUTE version 11059 processing, files: (Select from list, ABR-GPZ)  
MSP, Minneapolis/St. Paul Int'l Arpt, MN  
 Other: \_\_\_\_\_
- What meteorological upper air station was used? MPX: Twin Cities/Chanhassen, MN
- What consecutive 5- year period will be used? 2004 - 2008

a. If other, please specify: \_\_\_\_\_

### Subsection I: On-Site Meteorological Data

**Note:** If site-specific meteorological data will be collected and used, please follow the federal guidance (EPA's), as specified in section 8.3 and section 8.3.3.2 (QA/QC) of 40 CFR Part 51 dated 11/09/2005 (Appendix W).

a. If site-specific meteorological data will be collected and used, where will the **location** of the meteorological tower be set (city and state, coordinates, etc.)?

N/A

b. If site-specific meteorological data will be collected and used, what **year** of data is proposed to be used?

N/A

4. What justification(s) applies for the proposed surface and upper air stations identified above? (Check all that apply)

☒ Similar surface characteristics as meteorological tower ☐ Similar land use characteristics

☒ Similar wind patterns/characteristics ☒ Proximity to surface and/or upper air station(s)

☐ Other – Please describe: \_\_\_\_\_

a. Please provide additional detail for your justifications:

5. Will wind speed categories be used?

☐ Yes ☒ No – Skip to question 6.

a. If yes, please list the user-specified wind speed categories for the ME WINDCATS pathway:

b. If yes, please list the user-specified wind speed emission factors for the SO EMISFACT WSPEED pathway:

6. Additional information for this section (if not applicable, place N/A in field):

## Section H. SIL Analysis and Results

1. Will a SIL analysis be conducted in conjunction with this project, in order to determine if a cumulative analysis is required?

☐ N/A – Proceed to the next section (I)

☐ No – Will not model against SILs and instead proceed directly to conducting a cumulative analysis

☒ Yes – List for which pollutants: CO, SO<sub>2</sub>, PM<sub>10</sub>, PM, NO<sub>2</sub>

2. Extent of SIL receptor grid: 20 km

3. If a preliminary SIL analysis has been conducted for this project, it is optional but recommended that results be provided (in the table below) including corresponding model output files.

### Class II Significant Impact Levels Modeling Results for:

Pollutant	Averaging Time	Modeled Impacts (H1H) (µg/m <sup>3</sup> )	SILs (µg/m <sup>3</sup> ) *As of 10/26/2010	% of SIL	Exceed SIL?	Radius of Impact (If exceeds SIL)
SO <sub>2</sub>	1-hr		7.83	0.00%	(blank)	km
	3-hr		25	0.00%		
	24-hr		5	0.00%		
	Annual		1	0.00%		
PM <sub>10</sub>	24-hr		5	0.00%	(blank)	km
	Annual		1	0.00%		
PM <sub>2.5</sub>	24-hr		1.2	0.00%	(blank)	km
	Annual		0.3	0.00%		
NO <sub>x</sub>	1-hr		7.52	0.00%	(blank)	km
	Annual		1	0.00%		

CO	1-hr		2000	0.00%	(blank)	km
	8-hr		500	0.00%		

4. Additional information for this section (if not applicable, place N/A in field):  
This project is likely to exceed the SIL for each pollutant based on H1H impacts.

## Section I. Background Values

Please refer to pages 35-39 and Table B-4 of the "AERMOD User's Guide, Addendum for Version 11103" for guidance as well as the latest version of the MPCA's Air Dispersion Modeling Guidance for Title V and PSD.

**\*Contact MPCA air dispersion modeling staff for MPCA-generated products.**

1. Are background concentrations required for your analysis?  
☒ Yes – List pollutants required for: CO, SO2, PM10, PM, NO2  
☐ No – Please explain and proceed to question 3 (e.g., SIL analysis-only, etc.): \_\_\_\_\_
- a. **Will MPCA-generated background concentrations be used?**  
☒ No ☐ Yes – List pollutants required for: \_\_\_\_\_  
*If yes, check MPCA-generated background concentrations option(s) to be used:*  
☐ SO BACKGRND BGflag (BGflag can be defined as ANNUAL, SEASON, MONTH, etc. See Table B-4, Appendix B, of the AERMOD User's Guide Addendum)  
BGflag(s): \_\_\_\_\_  
☐ SO BACKGRND HOURLY  
File name(s): \_\_\_\_\_  
File creation date(s) & time(s): \_\_\_\_\_  
Radius Maximum (RMAX): \_\_\_\_\_ km  
☐ Uniform background concentration(s)
- b. **Will user-generated background concentrations be used?**  
☐ No ☒ Yes – List pollutants required for: CO, SO2, PM10, PM, NO2  
*If yes, check user-generated background concentrations option(s) to be used:*  
☐ SO BACKGRND BGflag (BGflag can be defined as ANNUAL, SEASON, MONTH, etc. See Table B-4, Appendix B, of the AERMOD User's Guide Addendum)  
BGflag(s): \_\_\_\_\_  
☐ SO BACKGRND HOURLY  
File name(s): \_\_\_\_\_  
File creation date(s) & time(s): \_\_\_\_\_  
Radius Maximum (RMAX): \_\_\_\_\_ km  
☒ Uniform background concentration(s)
- c. **If yes to question 1b above, please provide additional information regarding the development of user-generated background concentrations.**  
Background value(s) developed from: ☐ MPCA website ☒ EPA website  
☐ Other – explain: \_\_\_\_\_  
Examined monitors out to a distance of: 50 km  
Facility setting: ☒ Urban ☐ Suburban ☐ Rural  
Facility land use (industrial, residential, agricultural, cropland, mixed, etc.): urban  
Monitor setting: ☒ Urban ☐ Suburban ☐ Rural  
Monitor land use (industrial, residential, agricultural, cropland, mixed, etc.): urban  
Form of background value(s) (maximum, 98<sup>th</sup> percentile, etc.): design values km
2. If "SO BACKGROUND BGflag ANNUAL" or user-developed uniform background concentrations will be used, please input the background concentrations in the table below. (ANNUAL in this context means uniform value; it does not mean annual average.)

### Uniform Background Concentrations

Pollutant	Averaging Time Periods						
	½-Hour	1-Hour	3-Hour	8-Hour	24-Hour	Rolling 3-month	Annual

SO <sub>2</sub>	-	89	89	-	78	-	4
PM <sub>10</sub>	-	-	-	-	59	-	26
PM <sub>2.5</sub>	-	-	-	-	29	-	9
NO <sub>x</sub>	-	84	-	-	-	-	24
CO	-	5486	-	2667	-	-	-
Pb	-	-	-	-	-	-	-
H <sub>2</sub> S	-	-	-	-	-	-	-
Other -							

3. Additional information for this section (if not applicable, place N/A in field):

## Section J. Nearby Sources

**\*Contact MPCA air dispersion modeling staff for MPCA-generated products.**

1. Will any nearby sources be modeled explicitly for the analysis?

☐ N/A ☒ No ☐ Yes – List pollutants required for: \_\_\_\_\_

**a. Will MPCA-generated nearby sources be used?**

☐ N/A ☒ No ☐ Yes – List pollutants required for: \_\_\_\_\_

*If yes, check MPCA-generated near sources option(s) to be used:*

☐ Refined nearby source modeling Within \_\_\_\_\_ km of subject facility

List nearby sources: \_\_\_\_\_

☐ First-approximation representative (FAR) data

File name(s): \_\_\_\_\_

Creation date: \_\_\_\_\_ Creation time: \_\_\_\_\_

Distance (DMAX): \_\_\_\_\_ Scalar (SMAX): \_\_\_\_\_

Significance level: \_\_\_\_\_ Coef. \* D test: \_\_\_\_\_

**b. Will user-generated nearby sources be used?**

☐ N/A ☒ No ☐ Yes – List pollutants required for: \_\_\_\_\_

*If yes, check user-generated near sources option(s) to be used:*

☐ Refined nearby source modeling Within \_\_\_\_\_ km of subject facility

List nearby sources: \_\_\_\_\_

☐ First-approximation representative (FAR) data

File name(s): \_\_\_\_\_

Creation date: \_\_\_\_\_ Creation time: \_\_\_\_\_

Distance (DMAX): \_\_\_\_\_ Scalar (SMAX): \_\_\_\_\_

Significance level: \_\_\_\_\_ Coef. \* D test: \_\_\_\_\_

2. Additional information for this section (if not applicable, place N/A in field):

## Appendix

**Figure A.1**



TABLE 3-1.  
SUMMARY OF SUGGESTED PROCEDURES FOR ESTIMATING  
INITIAL LATERAL DIMENSIONS  $\sigma_{y0}$  AND  
INITIAL VERTICAL DIMENSIONS  $\sigma_{z0}$  FOR VOLUME AND LINE SOURCES

Type of Source	Procedure for Obtaining Initial Dimension	
(a) Initial Lateral Dimensions ( $\sigma_{y0}$ )		
Single Volume Source	$\sigma_{y0} =$	length of side divided by 4.3
Line Source Represented by Adjacent Volume Sources (see Figure 1-8(a) in EPA, 1995)	$\sigma_{y0} =$	length of side divided by 2.15
Line Source Represented by Separated Volume Sources (see Figure 1-8(b) in EPA, 1995)	$\sigma_{y0} =$	center to center distance divided by 2.15
(b) Initial Vertical Dimensions ( $\sigma_{z0}$ )		
Surface-Based Source ( $h_s = 0$ )	$\sigma_{z0} =$	vertical dimension of source divided by 2.15
Elevated Source ( $h_s > 0$ ) on or Adjacent to a Building	$\sigma_{z0} =$	building height divided by 2.15
Elevated Source ( $h_s > 0$ ) not on or Adjacent to a Building	$\sigma_{z0} =$	vertical dimension of source divided by 4.3

**Table A.1 – Modeled Form of the NAAQS/MAAQs for Averaging Periods**

Pollutant	1-hour	3-hour	8-hour	24-hour	Monthly	Annual
CO	H2H	-	H2H	-	-	-
NO <sub>2</sub>	98 <sup>th</sup> percentile of the daily max. 1-hour values	-	-	-	-	H1H
Pb	-	-	-	-	H1H	-
PM <sub>10</sub>	-	-	-	H6H of the multiyear values	-	H1H
PM <sub>2.5</sub>	-	-	-	98 <sup>th</sup> percentile of daily max. 24-hour values	-	H1H
SO <sub>2</sub>	99 <sup>th</sup> percentile of the daily max. 1-hour values	H2H	-	H2H	-	H1H

**Table A.2 – Modeled Form of PSD Increment for Averaging Periods**

Pollutant	1-hour	3-hour	24-hour	Annual
NO <sub>2</sub>	-	-	-	H1H
PM <sub>10</sub>	-	-	H2H	H1H
PM <sub>2.5</sub>	-	-	H2H*	H1H
SO <sub>2</sub>	-	H2H	H2H	H1H

*Criteria pollutants modeled for SIL analyses should be modeled as H1H's.*

## Helpful Webpages and Documents/Guidance

Please consult the following webpages and documents for the most current modeling guidance and recommendations when filling out this form:

- U.S. EPA's Support Center for Regulatory Atmospheric Modeling: <http://www.epa.gov/scram001/>  
**Please check the SCRAM webpage regularly for the most recent updates to guidance, models, and standards; especially, for modeling guidance related to: 24-hour PM2.5, 1-hour NO2, and 1-hour SO2 NAAQS.**
- U.S. EPA's 40 CFR Part 51 Appendix W: [http://www.epa.gov/ttn/scram/guidance/guide/appw\\_05.pdf](http://www.epa.gov/ttn/scram/guidance/guide/appw_05.pdf)
- U.S. EPA's AERMOD Implementation Guide: [http://www.epa.gov/ttn/scram/7thconf/aermod/aermod\\_implmtn\\_guide\\_19March2009.pdf](http://www.epa.gov/ttn/scram/7thconf/aermod/aermod_implmtn_guide_19March2009.pdf)
- U.S. EPA's AirData: <http://www.epa.gov/air/data/index.html>
- MPCA's Air Dispersion Modeling: <http://www.pca.state.mn.us/nwqh421>
- MPCA's Ambient Air Monitoring Network Plan: <http://www.pca.state.mn.us/mvri439>
- USGS' National Map Seamless Viewer (NED data): <http://seamless.usgs.gov/website/seamless/viewer.htm>

For questions on this form, or data requests from MPCA air dispersion modeling staff, please send an e-mail to: [AirModeling.PCA@state.mn.us](mailto:AirModeling.PCA@state.mn.us). Please be sure to include with your questions or requests: the form ID (ADQMP-01), facility name and permit #, and contact information.

Questions can also be asked by calling one of the MPCA's air dispersion modeler's (phone numbers are listed on the MPCA's Air Dispersion Modeling webpage, link above).

**Note:** Please be sure to use UTM Coordinates, NAD83, Zone 15 Extended for all locational data.



Under-Development by MPCA Staff:

Procedures and data involving the following subject areas are under-development and therefore, MPCA air dispersion modeling staff should be contacted (via the email address above) to discuss data files, methods, and/or procedures for:

- Standardized Air Modeling (SAM) Spreadsheet and/or Standardized Mobile Source (SMS) Spreadsheet
- Background concentration data
- Nearby sources
- Pre-processed AERMET meteorological data files
- Ozone data generated for Tier 3 NO<sub>2</sub> modeling

#### **Acronyms**

AERMAP

AERMET

AERMOD

AERSURFACE

Air Quality (AQ)

Air Quality Dispersion Modeling Protocol form (AQDMP-01)

Air Quality Dispersion Modeling Protocol Spreadsheet (AQDMPS-01)

BPIP-PRIME

Carbon Dioxide (CO)

Digital Elevation Model (DEM)

Environmental Assessment Worksheet (EAW)

Environmental Impact Statement (EIS)

U.S. Environmental Protection Agency (EPA)

Hydrogen Sulfide (H<sub>2</sub>S)

Kilometer (km)

Minnesota State Ambient Air Quality Standard (MAAQS)

Minnesota Pollution Control Agency (MPCA)

National Ambient Air Quality Standard (NAAQS)

National Elevation Dataset (NED)

Nitrogen Dioxide (NO<sub>2</sub>)

Particulate Matter less than 10 um in size (PM<sub>10</sub>)

Particulate Matter less than 2.5 um in size (PM<sub>2.5</sub>)

Lead (Pb)

POINTCAP

POINTHOR

Prevention of Significant Deterioration Program (PSD)

Plume Volume Molar Ratio Method/Ozone Limiting Method  
(PVMRM/OLM)

Standardized Air Modeling (SAM)

Significant Impact Level (SIL)

Sulfur Dioxide (SO<sub>2</sub>)

State Implementation Plan (SIP)

Standardized Mobile Source (SMS)

Universal Transverse Mercator (UTM)



Minnesota Pollution  
Control Agency  
520 Lafayette Road North  
St. Paul, MN 55155-4194

# AQDMPS-01

Air Quality Dispersion Modeling (AQDM) Protocol Spreadsheet  
Protocol Form for Criteria Pollutant Modeling  
Doc Type: Air Dispersion Modeling

AQ Facility ID No:	053000061
Facility Name:	Abbott
Facility Address:	800 28th Street
Facility Contact:	Mr. Timothy B. Grote

## Model Input Key

Parameters	Units	Description
Type =		POINT, AREA, AREA_CIRC, AREA_POLY, VOLUME, OPEN_PIT e.g. a stack = POINT, parking lot = AREA
ID =		Source ID up to 8 characters
Base_Elev =	[m]	Source base elevation above mean sea level
Height =	[m]	Release height above ground
Diam =	[m]	Stack/Area diameter (POINT and AREA_CIRC only)
Exit_Vel =	[m/s]	Exit velocity (POINT only)
Exit_Temp =	[K]	Exit temperature (POINT only)
Release_Type =		VERTICAL, HORIZONTAL, CAPPED (POINT only) - HORIZONTAL and CAPPED are non-default beta options
Emission_Rate =	[g/s or g/s/m <sup>2</sup> ]	Emission rate (g/s for POINT and VOLUME, g/s/m <sup>2</sup> for all AREA and OPENPIT)
X and Y	[m]	Stack Coordinates in UTM NAD83
Desc =		Stack description (boiler, furnace, etc)

## LOCATION

SRCPARAM										Easting		Northing	
Stack Vent	Pollutant	Base_Elev	Height	Diam	Exit_Vel	Exit_Temp	Release_Type	Emission_Rate	Emission_Rate	X1	Y1	DESC	
ID		[m]	[m]	[m]	[m/s]	[K]		(lb/hr)	(g/sec)	[m]	[m]		
SV001	NO <sub>2</sub>	450.31	48.77	5.77	15.31	327.6	VERTICAL	149	1182.56	495489.98	5251009.25		
SV001	PM <sub>2.5</sub>	450.31	47.57	5.47	15.31	327.35	VERTICAL	0.005	0.04	495494.98	5251011.25		Hood Exhaust
SV003	PM <sub>2.5</sub>	450.31	46.37	5.17	15.31	327.1	VERTICAL	10	79.37	495499.98	5251013.25		Emergency power generator

## Stack Parameter Input Table

Stack Parameter Input Table										Easting		Northing	
Stack Vent	Pollutant	Base_Elev	Height	Diam	Exit_Vel	Exit_Temp	Release_Type	Emission_Rate	Emission_Rate	X1	Y1	DESC	
ID		[m]	[m]	[m]	[m/s]	[K]		(lb/hr)	(g/sec)	[m]	[m]		
SV01	CO	262.13	30.48	1.83	11.08	546.48	VERTICAL	0.738	5.857271986	479307.36	4977968.18		GP01, EU01-04 Main Campus Boilers (common stack)
SV02	CO	262.13	6.1	0.2	52.39	785.93	VERTICAL	0.4879	3.872307591	479346.1	4977959.35		GP02, EU05 IC Engine 685 hp Cummins (peaking)
SV03	CO	262.13	6.1	0.2	52.39	785.93	VERTICAL	0.4879	3.872307591	479347.71	4977959.35		GP02, EU06 IC Engine 685 hp Cummins (peaking)
SV04	CO	262.13	6.1	0.2	52.83	763.71	VERTICAL	0.5489	4.356445248	479357.97	4977959.11		GP02, EU07 IC Engine 685 hp Cummins (peaking)

Stack Parameter Input Table

Stack Vent ID	Pollutant	Base Elev [m]	Height [m]	Diam [m]	Exit_Vel [m/s]	Exit_Temp [K]	Release_Type	Emission_Rate [g/sec]	Emission_Rate [lb/hr]	Eastings		Northings	
										X1 [m]	Y1 [m]	DESC	
SV05	CO	262.13	9.14	0.2	52.83	763.71	VERTICAL	0.5489	4.356445248	479321.27	4977966.22	GP02, EU08 IC Engine 685 hp Onan (peaking)	
SV06	CO	262.13	10.67	0.2	56.14	783.15	VERTICAL	0.7318	5.808064552	479324.85	4977974.6	GP02, EU09 IC Engine 890 hp Onan (peaking)	
SV07	CO	262.13	6.1	0.13	118.85	799.82	VERTICAL	0.2562	2.033378161	479343.18	4977754.78	GP02, EU10 IC Engine 355 hp Cummins (emergency use only)	
SV08	CO	262.13	41.15	0.76	0.001	544.26	VERTICAL	0.1613	1.280186953	479456.73	4977937.75	GP03, EU11-14 HH Boilers (common stack)	
SV09	CO	262.13	10.97	0.28	0.001	752.59	VERTICAL	0.8672	5.295354836	479452.85	4977933.37	GP04, EU15 IC Engine 1135 hp Cummins (peaking)	
SV10	CO	262.13	10.97	0.28	0.001	752.59	VERTICAL	0.8672	5.295354836	479453.25	4977934.09	GP04, EU16 IC Engine 1135 hp Cummins (peaking)	
SV11	CO	262.13	10.97	0.28	0.001	752.59	VERTICAL	0.8672	5.295354836	479453.87	4977934.78	GP04, EU17 IC Engine 1135 hp Cummins (peaking)	
SV12	CO	262.13	9.14	0.15	56.27	807.59	VERTICAL	0.2246	1.782578981	479392.21	4977625.33	GP04, EU18 IC Engine 382 hp Caterpillar (emergency use only)	
SV13	CO	262.13	30.48	0.71	0.001	449.82	VERTICAL	0.0423	0.335721687	479467.83	4977548.34	GP05, EU19 Raypak Boiler	
SV14	CO	262.13	30.48	0.71	0.001	449.82	VERTICAL	0.0423	0.335721687	479467.88	4977549.82	GP05, EU20 Raypak Boiler	
SV15	CO	262.13	36.27	0.23	0.001	422.04	VERTICAL	0.0318	0.252386516	479398.8	4977568.49	GP05, EU21 Proposed Boiler	
SV16	CO	262.13	36.27	0.23	0.001	422.04	VERTICAL	0.0318	0.252386516	479398.81	4977566.61	GP05, EU22 Proposed Boiler	
SV17	CO	262.13	36.27	0.23	0.001	422.04	VERTICAL	0.0318	0.252386516	479398.83	4977564.7	GP05, EU23 Proposed Boiler	
SV18	CO	262.13	36.27	0.23	0.001	422.04	VERTICAL	0.0318	0.252386516	479398.82	4977562.8	GP05, EU24 Proposed Boiler	
SV19	CO	262.13	35.97	0.31	0.001	422.04	VERTICAL	0.0177	0.140479287	479398.82	4977559.21	GP05, EU25 Proposed Boiler	
SV20	CO	262.13	35.97	0.31	0.001	422.04	VERTICAL	0.0177	0.140479287	479398.83	4977557.31	GP05, EU26 Proposed Boiler	
SV21	CO	262.13	9.14	0.31	98.91	673.15	VERTICAL	2.0691	16.4217906	479392.19	4977626.48	EU27 Proposed IC Engine (emergency use only)	
SV22	CO	262.13	36.27	0.23	0.001	422.04	VERTICAL	0.0318	0.252386516	479398.8	4977570.2	GP05, EU28 Proposed Boiler	
SV01	NO2	262.13	30.48	1.83	11.08	546.48	VERTICAL	2.9519	23.42829427	479307.36	4977968.18	GP01, EU01-04 Main Campus Boilers (common stack)	
SV02	NO2	262.13	6.1	0.2	52.39	785.93	VERTICAL	1.8368	14.57809916	479346.1	4977959.35	GP02, EU05 IC Engine 685 hp Cummins (peaking)	
SV03	NO2	262.13	6.1	0.2	52.39	785.93	VERTICAL	1.8368	14.57809916	479347.71	4977959.35	GP02, EU06 IC Engine 685 hp Cummins (peaking)	
SV04	NO2	262.13	6.1	0.2	52.83	763.71	VERTICAL	2.0665	16.40115523	479357.97	4977959.11	GP02, EU07 IC Engine 685 hp Cummins (peaking)	
SV05	NO2	262.13	9.14	0.2	52.83	763.71	VERTICAL	2.0665	16.40115523	479321.27	4977966.22	GP02, EU08 IC Engine 685 hp Onan (peaking)	
SV06	NO2	262.13	10.67	0.2	56.14	783.15	VERTICAL	2.7552	21.86714875	479324.85	4977974.6	GP02, EU09 IC Engine 890 hp Onan (peaking)	
SV07	NO2	262.13	6.1	0.13	118.85	799.82	VERTICAL	0.9647	7.656518001	479343.18	4977754.78	GP02, EU10 IC Engine 355 hp Cummins (emergency use only)	
SV08	NO2	262.13	41.15	0.76	0	544.26	VERTICAL	0.8451	5.119954144	479456.73	4977937.75	GP03, EU11-14 HH Boilers (common stack)	
SV09	NO2	262.13	10.97	0.28	0	752.59	VERTICAL	2.5119	19.9361538	479452.85	4977933.37	GP04, EU15 IC Engine 1135 hp Cummins (peaking)	
SV10	NO2	262.13	10.97	0.28	0	752.59	VERTICAL	2.5119	19.9361538	479453.25	4977934.09	GP04, EU16 IC Engine 1135 hp Cummins (peaking)	
SV11	NO2	262.13	10.97	0.28	0	752.59	VERTICAL	2.5119	19.9361538	479453.87	4977934.78	GP04, EU17 IC Engine 1135 hp Cummins (peaking)	
SV12	NO2	262.13	9.14	0.15	56.27	807.59	VERTICAL	0.8454	6.70967173	479392.21	4977625.33	GP04, EU18 IC Engine 382 hp Caterpillar (emergency use only)	
SV13	NO2	262.13	30.48	0.71	0	449.82	VERTICAL	0.0504	0.400008819	479467.83	4977548.34	GP05, EU19 Raypak Boiler	
SV14	NO2	262.13	30.48	0.71	0	449.82	VERTICAL	0.0504	0.400008819	479467.88	4977549.82	GP05, EU20 Raypak Boiler	
SV15	NO2	262.13	36.27	0.23	0	422.04	VERTICAL	0.0378	0.300006614	479398.8	4977568.49	GP05, EU21 Proposed Boiler	
SV16	NO2	262.13	36.27	0.23	0	422.04	VERTICAL	0.0378	0.300006614	479398.81	4977566.61	GP05, EU22 Proposed Boiler	
SV17	NO2	262.13	36.27	0.23	0	422.04	VERTICAL	0.0378	0.300006614	479398.83	4977564.7	GP05, EU23 Proposed Boiler	
SV18	NO2	262.13	36.27	0.23	0	422.04	VERTICAL	0.0378	0.300006614	479398.82	4977562.8	GP05, EU24 Proposed Boiler	
SV19	NO2	262.13	35.97	0.31	0	422.04	VERTICAL	0.0211	0.167464009	479398.82	4977559.21	GP05, EU25 Proposed Boiler	
SV20	NO2	262.13	35.97	0.31	0	422.04	VERTICAL	0.0211	0.167464009	479398.83	4977557.31	GP05, EU26 Proposed Boiler	
SV21	NO2	262.13	9.14	0.31	98.91	673.15	VERTICAL	7.7897	61.82437884	479392.19	4977626.48	EU27 Proposed IC Engine (emergency use only)	
SV22	NO2	262.13	36.27	0.23	0	422.04	VERTICAL	0.0378	0.300006614	479398.8	4977570.2	GP05, EU28 Proposed Boiler	
SV01	PM10	262.13	30.48	1.83	11.08	546.48	VERTICAL	0.1476	1.171454397	479307.36	4977968.18	GP01, EU01-04 Main Campus Boilers (common stack)	
SV02	PM10	262.13	6.1	0.2	52.39	785.93	VERTICAL	0.0329	0.261118668	479346.1	4977959.35	GP02, EU05 IC Engine 685 hp Cummins (peaking)	
SV03	PM10	262.13	6.1	0.2	52.39	785.93	VERTICAL	0.0329	0.261118668	479347.71	4977959.35	GP02, EU06 IC Engine 685 hp Cummins (peaking)	
SV04	PM10	262.13	6.1	0.2	52.83	763.71	VERTICAL	0.037	0.293657268	479357.97	4977959.11	GP02, EU07 IC Engine 685 hp Cummins (peaking)	
SV05	PM10	262.13	9.14	0.2	52.83	763.71	VERTICAL	0.037	0.293657268	479321.27	4977966.22	GP02, EU08 IC Engine 685 hp Onan (peaking)	

Stack Parameter Input Table

Stack Vent ID	Pollutant	Base Elev [m]	Height [m]	Diam [m]	Exit_Vel [m/s]	Exit_Temp [K]	Release_Type	Emission_Rate [g/sec]	Emission_Rate [lb/hr]	Eastings		Northings	
										X1 [m]	Y1 [m]	DESC	
SV06	PM10	262.13	10.67	0.2	56.14	783.15	VERTICAL	0.0493	0.391278467	479324.85	4977974.6	GP02, EU09 IC Engine 890 hp Onan (peaking)	
SV07	PM10	262.13	6.1	0.13	118.85	799.82	VERTICAL	0.0173	0.137304614	479343.18	4977754.78	GP02, EU10 IC Engine 355 hp Cummins (emergency use only)	
SV08	PM10	262.13	41.15	0.76	0	544.26	VERTICAL	0.0323	0.256354858	479456.73	4977937.75	GP03, EU11-14 HH Boilers (common stack)	
SV09	PM10	262.13	10.97	0.28	0	752.59	VERTICAL	0.045	0.357150731	479452.65	4977933.37	GP04, EU15 IC Engine 1135 hp Cummins (peaking)	
SV10	PM10	262.13	10.97	0.28	0	752.59	VERTICAL	0.045	0.357150731	479453.25	4977934.09	GP04, EU16 IC Engine 1135 hp Cummins (peaking)	
SV11	PM10	262.13	10.97	0.28	0	752.59	VERTICAL	0.045	0.357150731	479453.87	4977934.78	GP04, EU17 IC Engine 1135 hp Cummins (peaking)	
SV12	PM10	262.13	9.14	0.15	56.27	807.59	VERTICAL	0.0151	0.119843912	479392.21	4977625.33	GP04, EU18 IC Engine 382 hp Caterpillar (emergency use only)	
SV13	PM10	262.13	30.48	0.71	0	449.82	VERTICAL	0.0038	0.030759395	479467.83	4977548.34	GP05, EU19 Raypak Boiler	
SV14	PM10	262.13	30.48	0.71	0	449.82	VERTICAL	0.0038	0.030759395	479467.68	4977549.82	GP05, EU20 Raypak Boiler	
SV15	PM10	262.13	36.27	0.23	0	422.04	VERTICAL	0.0029	0.023071638	479398.8	4977568.49	GP05, EU21 Proposed Boiler	
SV16	PM10	262.13	36.27	0.23	0	422.04	VERTICAL	0.0029	0.023071638	479398.81	4977566.61	GP05, EU22 Proposed Boiler	
SV17	PM10	262.13	36.27	0.23	0	422.04	VERTICAL	0.0029	0.023071638	479398.83	4977564.7	GP05, EU23 Proposed Boiler	
SV18	PM10	262.13	36.27	0.23	0	422.04	VERTICAL	0.0029	0.023071638	479398.82	4977562.8	GP05, EU24 Proposed Boiler	
SV19	PM10	262.13	35.97	0.31	0	422.04	VERTICAL	0.0016	0.012698693	479398.82	4977559.21	GP05, EU25 Proposed Boiler	
SV20	PM10	262.13	35.97	0.31	0	422.04	VERTICAL	0.0016	0.012698693	479398.83	4977557.31	GP05, EU26 Proposed Boiler	
SV21	PM10	262.13	9.14	0.31	98.91	673.15	VERTICAL	0.1395	1.107167266	479392.19	4977626.48	EU27 Proposed IC Engine (emergency use only)	
SV22	PM10	262.13	36.27	0.23	0	422.04	VERTICAL	0.0029	0.023071638	479398.8	4977570.2	GP05, EU28 Proposed Boiler	
SV01	PM2.5	262.13	30.48	1.83	11.08	546.48	VERTICAL	0.0369	0.292863599	479307.36	4977968.18	GP01, EU01-04 Main Campus Boilers (common stack)	
SV02	PM2.5	262.13	6.1	0.2	52.39	785.93	VERTICAL	0.0275	0.21825878	479346.1	4977959.35	GP02, EU05 IC Engine 685 hp Cummins (peaking)	
SV03	PM2.5	262.13	6.1	0.2	52.39	785.93	VERTICAL	0.0275	0.21825878	479347.1	4977959.35	GP02, EU06 IC Engine 685 hp Cummins (peaking)	
SV04	PM2.5	262.13	6.1	0.2	52.83	763.71	VERTICAL	0.0309	0.245243502	479357.97	4977959.11	GP02, EU07 IC Engine 685 hp Cummins (peaking)	
SV05	PM2.5	262.13	9.14	0.2	52.83	763.71	VERTICAL	0.0309	0.245243502	479321.27	4977966.22	GP02, EU08 IC Engine 685 hp Onan (peaking)	
SV06	PM2.5	262.13	10.67	0.2	56.14	783.15	VERTICAL	0.0412	0.326991336	479324.85	4977974.6	GP02, EU09 IC Engine 890 hp Onan (peaking)	
SV07	PM2.5	262.13	6.1	0.13	118.85	799.82	VERTICAL	0.0144	0.114288234	479343.18	4977754.78	GP02, EU10 IC Engine 355 hp Cummins (emergency use only)	
SV08	PM2.5	262.13	41.15	0.76	0	544.26	VERTICAL	0.0081	0.064287132	479456.73	4977937.75	GP03, EU11-14 HH Boilers (common stack)	
SV09	PM2.5	262.13	10.97	0.28	0	752.59	VERTICAL	0.0376	0.298419277	479452.65	4977933.37	GP04, EU15 IC Engine 1135 hp Cummins (peaking)	
SV10	PM2.5	262.13	10.97	0.28	0	752.59	VERTICAL	0.0376	0.298419277	479453.25	4977934.09	GP04, EU16 IC Engine 1135 hp Cummins (peaking)	
SV11	PM2.5	262.13	10.97	0.28	0	752.59	VERTICAL	0.0376	0.298419277	479453.87	4977934.78	GP04, EU17 IC Engine 1135 hp Cummins (peaking)	
SV12	PM2.5	262.13	9.14	0.15	56.27	807.59	VERTICAL	0.0127	0.100796873	479392.21	4977625.33	GP04, EU18 IC Engine 382 hp Caterpillar (emergency use only)	
SV13	PM2.5	262.13	30.48	0.71	0	449.82	VERTICAL	0.0038	0.030759395	479467.83	4977548.34	GP05, EU19 Raypak Boiler	
SV14	PM2.5	262.13	30.48	0.71	0	449.82	VERTICAL	0.0038	0.030759395	479467.68	4977549.82	GP05, EU20 Raypak Boiler	
SV15	PM2.5	262.13	36.27	0.23	0	422.04	VERTICAL	0.0029	0.023071638	479398.8	4977568.49	GP05, EU21 Proposed Boiler	
SV16	PM2.5	262.13	36.27	0.23	0	422.04	VERTICAL	0.0029	0.023071638	479398.81	4977566.61	GP05, EU22 Proposed Boiler	
SV17	PM2.5	262.13	36.27	0.23	0	422.04	VERTICAL	0.0029	0.023071638	479398.83	4977564.7	GP05, EU23 Proposed Boiler	
SV18	PM2.5	262.13	36.27	0.23	0	422.04	VERTICAL	0.0029	0.023071638	479398.82	4977562.8	GP05, EU24 Proposed Boiler	
SV19	PM2.5	262.13	35.97	0.31	0	422.04	VERTICAL	0.0016	0.012698693	479398.82	4977559.21	GP05, EU25 Proposed Boiler	
SV20	PM2.5	262.13	35.97	0.31	0	422.04	VERTICAL	0.0016	0.012698693	479398.83	4977557.31	GP05, EU26 Proposed Boiler	
SV21	PM2.5	262.13	9.14	0.31	98.91	673.15	VERTICAL	0.1166	0.925417227	479392.19	4977626.48	EU27 Proposed IC Engine (emergency use only)	
SV22	PM2.5	262.13	36.27	0.23	0	422.04	VERTICAL	0.0029	0.023071638	479398.8	4977570.2	GP05, EU28 Proposed Boiler	
SV01	SO2	262.13	30.48	1.83	11.08	546.48	VERTICAL	1.0479	8.316850019	479307.36	4977968.18	GP01, EU01-04 Main Campus Boilers (common stack)	
SV02	SO2	262.13	6.1	0.2	52.39	785.93	VERTICAL	0.0009	0.007143015	479346.1	4977959.35	GP02, EU05 IC Engine 685 hp Cummins (peaking)	
SV03	SO2	262.13	6.1	0.2	52.39	785.93	VERTICAL	0.0009	0.007143015	479347.1	4977959.35	GP02, EU06 IC Engine 685 hp Cummins (peaking)	
SV04	SO2	262.13	6.1	0.2	52.83	763.71	VERTICAL	0.001	0.007936683	479357.97	4977959.11	GP02, EU07 IC Engine 685 hp Cummins (peaking)	
SV05	SO2	262.13	9.14	0.2	52.83	763.71	VERTICAL	0.001	0.007936683	479321.27	4977966.22	GP02, EU08 IC Engine 685 hp Onan (peaking)	
SV06	SO2	262.13	10.67	0.2	56.14	783.15	VERTICAL	0.0013	0.010317688	479324.85	4977974.6	GP02, EU09 IC Engine 890 hp Onan (peaking)	

Stack Parameter Input Table

Stack Vent ID	Pollutant	Base Elev [m]	Height [m]	Diam [m]	Exit_Vel [m/s]	Exit_Temp [K]	Release_Type	Emission_Rate (g/sec)	Emission_Rate (lb/hr)	Easting		Northing	
										X1 [m]	Y1 [m]	DESC	
SV07	SO2	262.13	6.1	0.13	118.85	799.82	VERTICAL	0.0005	0.003968341	479343.18	4977754.78	GP02. EU10 IC Engine 355 hp Cummins (emergency use only)	
SV08	SO2	262.13	41.15	0.76	0	544.26	VERTICAL	0.229	1.817500386	479456.73	4977937.75	GP03. EU11-14 HH Boilers (common stack)	
SV09	SO2	262.13	10.97	0.28	0	752.59	VERTICAL	0.0012	0.009524019	479452.65	4977933.37	GP04. EU15 IC Engine 1135 hp Cummins (peaking)	
SV10	SO2	262.13	10.97	0.28	0	752.59	VERTICAL	0.0012	0.009524019	479453.25	4977934.09	GP04. EU16 IC Engine 1135 hp Cummins (peaking)	
SV11	SO2	262.13	10.97	0.28	0	752.59	VERTICAL	0.0012	0.009524019	479453.87	4977934.78	GP04. EU17 IC Engine 1135 hp Cummins (peaking)	
SV12	SO2	262.13	9.14	0.15	56.27	807.59	VERTICAL	0.0004	0.003174673	479392.21	4977625.33	GP04. EU18 IC Engine 382 hp Caterpillar (emergency use only)	
SV13	SO2	262.13	30.48	0.71	0	449.82	VERTICAL	0.0003	0.002381005	479467.83	4977548.34	GP05. EU19 Raypak Boiler	
SV14	SO2	262.13	30.48	0.71	0	449.82	VERTICAL	0.0003	0.002381005	479467.68	4977549.82	GP05. EU20 Raypak Boiler	
SV15	SO2	262.13	36.27	0.23	0	422.04	VERTICAL	0.0002	0.001587337	479398.8	4977568.49	GP05. EU21 Proposed Boiler	
SV16	SO2	262.13	36.27	0.23	0	422.04	VERTICAL	0.0002	0.001587337	479398.81	4977566.61	GP05. EU22 Proposed Boiler	
SV17	SO2	262.13	36.27	0.23	0	422.04	VERTICAL	0.0002	0.001587337	479398.83	4977564.7	GP05. EU23 Proposed Boiler	
SV18	SO2	262.13	36.27	0.23	0	422.04	VERTICAL	0.0002	0.001587337	479398.82	4977562.8	GP05. EU24 Proposed Boiler	
SV19	SO2	262.13	35.97	0.31	0	422.04	VERTICAL	0.0001	0.000793668	479398.82	4977559.21	GP05. EU25 Proposed Boiler	
SV20	SO2	262.13	35.97	0.31	0	422.04	VERTICAL	0.0001	0.000793668	479398.83	4977557.31	GP05. EU26 Proposed Boiler	
SV21	SO2	262.13	9.14	0.31	98.91	673.15	VERTICAL	0.0037	0.029365727	479392.19	4977625.48	EU27 Proposed IC Engine (emergency use only)	
SV22	SO2	262.13	36.27	0.23	0	422.04	VERTICAL	0.0002	0.001587337	479398.8	4977570.2	GP05. EU28 Proposed Boiler	



Minnesota Pollution  
Control Agency  
520 Lafayette Road North  
St. Paul, MN 55155-4194

# AQDMPS-01

Air Quality Dispersion Modeling (AQDM) Protocol Spreadsheet  
Protocol Form for Criteria Pollutant Modeling  
Doc Type: Air Dispersion Modeling

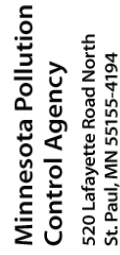
AQ Facility ID No:	05300061
Facility Name:	Abbott
Facility Address:	800 28th
	Mr.
Facility Contact:	Timothy B. Grote

## Model Input Key

Parameters	Units	Description
ID =		Source ID up to 8 characters
Desc =		Optional description
Base_Elev =	[m]	Source base elevation above mean sea level
Height =	[m]	Release height above ground
Length_X =	[m]	X side length (OPEN PIT, AREA and VOLUME only, optional for VOLUME, will be used to calculate SigmaY)
Length_Y =	[m]	Y side length (OPEN PIT and AREA only)
SigmaZ =	[m]	Initial sigma Z (all AREA and VOLUME only, optional for all AREA)
Emission_Rate =	[g/s or g/s/m2]	Emission rate (g/s for POINT and VOLUME, g/s/m2 for all AREA and OPENPIT)
Num_Coords =		Number of coordinate pairs (POINT = 1, VOLUME = 1, OPENPIT = 1, AREA = 1, AREA_CIRC = 1, AREA_POLY >= 3)
X1 =	[m]	X coordinate of source location [m] Enter here the X coordinate for the vertex of the area source that occurs in the southwest quadrant of the source.
Y1 =	[m]	Y coordinate of source location [m] Enter here the Y coordinate for the vertex of the area source that occurs in the southwest quadrant of the source.

ID	Pollutant	Base_Elev [m]	Height [m]	Length_X [m]	Length_Y [m]	Rotation_Angle [deg]	Emission_Rate (g/sec)	Emission_Rate (lb/hr)	X1 [m]	Y1 [m]	X2 [m]	Y2 [m]	X3 [m]	Y3 [m]	X4 [m]	Y4 [m]	Desc
CONCWE	PM <sub>10</sub>	469.24	0	200	500	0	0	1	483070.73	5247239.03							parking lot
OXPILE	PM <sub>2.5</sub>	469.24	0	50	100	0	0.00000536		483070.73	5247239.03							tailings basin

ID	Pollutant	Base_Elev [m]	Height [m]	Length_X [m]	Length_Y [m]	Rotation_Angle [deg]	Emission_Rate (g/sec)	Emission_Rate (lb/hr)	X1 [m]	Y1 [m]	X2 [m]	Y2 [m]	X3 [m]	Y3 [m]	X4 [m]	Y4 [m]	Desc
NONE																	



Air Quality Dispersion Modeling (AQDM) Protocol Spreadsheet  
Protocol Form for Criteria Pollutant Modeling  
Doc Type: Air Dispersion Modeling

## Model Input Key

[illegible]



**Minnesota Pollution  
Control Agency**

520 Lafayette Road North  
St. Paul, MN 55155-4194

# AQDMPS-01

## Air Quality Dispersion Modeling (AQDM) Protocol Spreadsheet Protocol Form for Criteria Pollutant Modeling

Doc Type: Air Dispersion Modeling

AQ Facility ID No:	05300061
Facility Name:	Abbott
Facility Address:	800 28th Street
Facility Contact:	Mr. Timothy B. Grote

Stack Vent ID	Emission Unit	Pollutant	Description	Emission Factor	Emission Factors References/Assumptions/Equations
SV001	EU001	NO <sub>2</sub>	Emergency Power Generator Concentrator - Diesel	0.01	Used to generate short - term emission rate 1,200 kW capacity provided by vendor x 1.341 hp/kW = 1,609 hp lb/hp-hr emission factors from AP-42 'Large Stationary Diesel And All Stationary Dual-fuel Engines'

### Emission Calculations Table

Stack Vent ID	Emission Unit	Pollutant	Description	Emission Factor	Emission Factors References/Assumptions/Equations
SV01	EU01	CO	Boiler 1 - Bros - W2-37 - Main Campus	84.00	AP-42 Section 1.4 (lb/MMSCF)
SV01	EU02	CO	Boiler 2 - Bros - W2-37 - Main Campus	84.00	AP-42 Section 1.4 (lb/MMSCF)
SV01	EU03	CO	Boiler 3 - Bros - W2-37 - Main Campus	84.00	AP-42 Section 1.4 (lb/MMSCF)
SV01	EU04	CO	Boiler 4 - Cleaver Brooks - WT 439X-CN6 - N	84.00	AP-42 Section 1.4 (lb/MMSCF)
SV02	EU05	CO	IC Engine 1 - Cummins - VT-1710-GS - Mair	0.85	AP-42 Section 3.4 (lb/MMBtu)
SV03	EU06	CO	IC Engine 2 - Cummins - VT-1710-GS - Mair	0.85	AP-42 Section 3.4 (lb/MMBtu)
SV04	EU07	CO	IC Engine 3 - Cummins - KTTA 19-G1 - Mair	0.85	AP-42 Section 3.4 (lb/MMBtu)
SV05	EU08	CO	IC Engine 4 - Onan - KTTA 19-G1 - Main Ca	0.85	AP-42 Section 3.4 (lb/MMBtu)
SV06	EU09	CO	IC Engine 5 - Onan - VTA-28 G2 - Main Cam	0.85	AP-42 Section 3.4 (lb/MMBtu)
SV07	EU10	CO	IC Engine 6 - Cummins - NT-855-GS - SKI	0.85	AP-42 Section 3.4 (lb/MMBtu)
SV08	EU11	CO	Boiler 5 - Cleaver Brooks - FLX-900 - Heart H	84.00	AP-42 Section 1.4 (lb/MMSCF)
SV08	EU12	CO	Boiler 6 - Cleaver Brooks - FLX-900 - Heart H	84.00	AP-42 Section 1.4 (lb/MMSCF)
SV08	EU13	CO	Boiler 7 - Cleaver Brooks - FLX-900 - Heart H	84.00	AP-42 Section 1.4 (lb/MMSCF)
SV08	EU14	CO	Boiler 8 - Cleaver Brooks - FLX-900 - Heart H	84.00	AP-42 Section 1.4 (lb/MMSCF)
SV09	EU15	CO	IC Engine 7 - Cummins - QST30-G1 - Heart	0.85	AP-42 Section 3.4 (lb/MMBtu)
SV10	EU16	CO	IC Engine 8 - Cummins - QST30-G1 - Heart	0.85	AP-42 Section 3.4 (lb/MMBtu)
SV11	EU17	CO	IC Engine 9 - Cummins - QST30-G1 - Heart	0.85	AP-42 Section 3.4 (lb/MMBtu)



Stack Vent ID	Emission Unit	Pollutant	Description	Emission Factor	Emission Factors References/Assumptions/Equations Used to generate short - term emission rate
SV12	EU18	CO	IC Engine 10 - Caterpillar - 3306B - Parking 0	0.85	AP-42 Section 3.4 (lb/MMBtu)
SV13	EU19	CO	Raypak Boiler - Raypac - H34001 - Parking 0	84.00	AP-42 Section 1.4 (lb/MMSCF)
SV14	EU20	CO	Raypak Boiler - Raypac - H34001 - Parking 0	84.00	AP-42 Section 1.4 (lb/MMSCF)
SV15	EU21	CO	NEW BOILER #1 - Hydratherm - KN-30 - 10th A	84.00	AP-42 Section 1.4 (lb/MMSCF)
SV16	EU22	CO	NEW BOILER #2 - Hydratherm - KN-30 - 10th A	84.00	AP-42 Section 1.4 (lb/MMSCF)
SV17	EU23	CO	NEW BOILER #3 - Hydratherm - KN-30 - 10th A	84.00	AP-42 Section 1.4 (lb/MMSCF)
SV18	EU24	CO	NEW BOILER #4 - Hydratherm - KN-30 - 10th A	84.00	AP-42 Section 1.4 (lb/MMSCF)
SV19	EU25	CO	NEW BOILER #6 - Lattner - WLF - 40 - 10th A	84.00	AP-42 Section 1.4 (lb/MMSCF)
SV20	EU26	CO	NEW BOILER #7 - Lattner - WLF - 40 - 10th A	84.00	AP-42 Section 1.4 (lb/MMSCF)
SV21	EU27	CO	NEW GEN #1 - Caterpillar - DM8263 - 10th A	0.85	AP-42 Section 3.4 (lb/MMBtu)
SV22	EU28	CO	NEW BOILER #5 - Hydratherm - KN-30 - 10th A	84.00	AP-42 Section 1.4 (lb/MMSCF)



**Minnesota Pollution  
Control Agency**

520 Lafayette Road North  
St. Paul, MN 55155-4194

# AQDMPS-01

## Air Quality Dispersion Modeling (AQDM) Protocol Spreadsheet Protocol Form for Criteria Pollutant Modeling

Doc Type: Air Dispersion Modeling

AQ Facility ID No:	05300061
Facility Name:	Abbott
Facility Address:	800 28th Street
Facility Contact:	Mr. Timothy B. Grote

Stack Vent ID	Emission Unit	Pollutant	Description	Emission Factor	Emission Factors References/Assumptions/Equations
SV001	EU001	NO <sub>2</sub>	Emergency Power Generator Concentrator - Diesel	0.01	Used to generate short - term emission rate 1,200 kW capacity provided by vendor x 1.341 hp/kW = 1,609 hp lb/hp-hr emission factors from AP-42 'Large Stationary Diesel And All Stationary Dual-fuel Engines'

### Emission Calculations Table

Stack Vent ID	Emission Unit	Pollutant	Description	Emission Factor	Emission Factors References/Assumptions/Equations
SV01	EU01	PM10	Boiler 1 - Bros - W2-37 - Main Campus	7.60	AP-42 Section 1.4 (lb/MMSCF)
SV01	EU02	PM10	Boiler 2 - Bros - W2-37 - Main Campus	7.60	AP-42 Section 1.4 (lb/MMSCF)
SV01	EU03	PM10	Boiler 3 - Bros - W2-37 - Main Campus	7.60	AP-42 Section 1.4 (lb/MMSCF)
SV01	EU04	PM10	Boiler 4 - Cleaver Brooks - WT 439X-CN6 - N	7.60	AP-42 Section 1.4 (lb/MMSCF)
SV02	EU05	PM10	IC Engine 1 - Cummins - VT-1710-GS - Mair	0.0573	AP-42 Table 3.4-2 (lb/MMBtu)
SV03	EU06	PM10	IC Engine 2 - Cummins - VT-1710-GS - Mair	0.0573	AP-42 Table 3.4-2 (lb/MMBtu)
SV04	EU07	PM10	IC Engine 3 - Cummins - KTTA 19-G1 - Mair	0.0573	AP-42 Table 3.4-2 (lb/MMBtu)
SV05	EU08	PM10	IC Engine 4 - Onan - KTTA 19-G1 - Main Ca	0.0573	AP-42 Table 3.4-2 (lb/MMBtu)
SV06	EU09	PM10	IC Engine 5 - Onan - VTA-28 G2 - Main Cam	0.0573	AP-42 Table 3.4-2 (lb/MMBtu)
SV07	EU10	PM10	IC Engine 6 - Cummins - NT-855-GS - SKI	0.0573	AP-42 Table 3.4-2 (lb/MMBtu)
SV08	EU11	PM10	Boiler 5 - Cleaver Brooks - FLX-900 - Heart H	7.60	AP-42 Section 1.4 (lb/MMSCF)
SV08	EU12	PM10	Boiler 6 - Cleaver Brooks - FLX-900 - Heart H	7.60	AP-42 Section 1.4 (lb/MMSCF)
SV08	EU13	PM10	Boiler 7 - Cleaver Brooks - FLX-900 - Heart H	7.60	AP-42 Section 1.4 (lb/MMSCF)
SV08	EU14	PM10	Boiler 8 - Cleaver Brooks - FLX-900 - Heart H	7.60	AP-42 Section 1.4 (lb/MMSCF)
SV09	EU15	PM10	IC Engine 7 - Cummins - QST30-G1 - Heart	0.0573	AP-42 Table 3.4-2 (lb/MMBtu)
SV10	EU16	PM10	IC Engine 8 - Cummins - QST30-G1 - Heart	0.0573	AP-42 Table 3.4-2 (lb/MMBtu)
SV11	EU17	PM10	IC Engine 9 - Cummins - QST30-G1 - Heart	0.0573	AP-42 Table 3.4-2 (lb/MMBtu)

Stack Vent ID	Emission Unit	Pollutant	Description	Emission Factor	Emission Factors References/Assumptions/Equations Used to generate short - term emission rate
SV12	EU18	PM10	IC Engine 10 - Caterpillar - 3306B - Parking 0	0.0573	AP-42 Table 3.4-2 (lb/MMBtu)
SV13	EU19	PM10	Raypak Boiler - Raypac - H34001 - Parking 0	7.60	AP-42 Section 1.4 (lb/MMSCF)
SV14	EU20	PM10	Raypak Boiler - Raypac - H34001 - Parking 0	7.60	AP-42 Section 1.4 (lb/MMSCF)
SV15	EU21	PM10	NEW BOILER #1 - Hydratherm - KN-30 - 10th A	7.60	AP-42 Section 1.4 (lb/MMSCF)
SV16	EU22	PM10	NEW BOILER #2 - Hydratherm - KN-30 - 10th A	7.60	AP-42 Section 1.4 (lb/MMSCF)
SV17	EU23	PM10	NEW BOILER #3 - Hydratherm - KN-30 - 10th A	7.60	AP-42 Section 1.4 (lb/MMSCF)
SV18	EU24	PM10	NEW BOILER #4 - Hydratherm - KN-30 - 10th A	7.60	AP-42 Section 1.4 (lb/MMSCF)
SV19	EU25	PM10	NEW BOILER #6 - Lattner - WLF - 40 - 10th A	7.60	AP-42 Section 1.4 (lb/MMSCF)
SV20	EU26	PM10	NEW BOILER #7 - Lattner - WLF - 40 - 10th A	7.60	AP-42 Section 1.4 (lb/MMSCF)
SV21	EU27	PM10	NEW GEN #1 - Caterpillar - DM8263 - 10th A	0.0573	AP-42 Table 3.4-2 (lb/MMBtu)
SV22	EU28	PM10	NEW BOILER #5 - Hydratherm - KN-30 - 10th A	7.60	AP-42 Section 1.4 (lb/MMSCF)



**Minnesota Pollution  
Control Agency**

520 Lafayette Road North  
St. Paul, MN 55155-4194

# AQDMPS-01

## Air Quality Dispersion Modeling (AQDM) Protocol Spreadsheet Protocol Form for Criteria Pollutant Modeling

Doc Type: Air Dispersion Modeling

AQ Facility ID No:	05300061
Facility Name:	Abbott
Facility Address:	800 28th Street
Facility Contact:	Mr. Timothy B. Grote

Stack Vent ID	Emission Unit	Pollutant	Description	Emission Factor	Emission Factors References/Assumptions/Equations
SV001	EU001	NO <sub>2</sub>	Emergency Power Generator Concentrator - Diesel	0.01	Used to generate short - term emission rate 1,200 kW capacity provided by vendor x 1.341 hp/kW = 1,609 hp lb/hp-hr emission factors from AP-42 'Large Stationary Diesel And All Stationary Dual-fuel Engines'

**Emission Calculations Table**

Stack Vent ID	Emission Unit	Pollutant	Description	Emission Factor	Emission Factors References/Assumptions/Equations
SV01	EU01	PM2.5	Boiler 1 - Bros - W2-37 - Main Campus	7.60	AP-42 Section 1.4 (lb/MMSCF)
SV01	EU02	PM2.5	Boiler 2 - Bros - W2-37 - Main Campus	7.60	AP-42 Section 1.4 (lb/MMSCF)
SV01	EU03	PM2.5	Boiler 3 - Bros - W2-37 - Main Campus	7.60	AP-42 Section 1.4 (lb/MMSCF)
SV01	EU04	PM2.5	Boiler 4 - Cleaver Brooks - WT 439X-CN6 - N	7.60	AP-42 Section 1.4 (lb/MMSCF)
SV02	EU05	PM2.5	IC Engine 1 - Cummins - VT-1710-GS - Mair	0.0479	AP-42 Table 3.4-2 (lb/MMBtu)
SV03	EU06	PM2.5	IC Engine 2 - Cummins - VT-1710-GS - Mair	0.0479	AP-42 Table 3.4-2 (lb/MMBtu)
SV04	EU07	PM2.5	IC Engine 3 - Cummins - KTTA 19-G1 - Mair	0.0479	AP-42 Table 3.4-2 (lb/MMBtu)
SV05	EU08	PM2.5	IC Engine 4 - Onan - KTTA 19-G1 - Main Ca	0.0479	AP-42 Table 3.4-2 (lb/MMBtu)
SV06	EU09	PM2.5	IC Engine 5 - Onan - VTA-28 G2 - Main Cam	0.0479	AP-42 Table 3.4-2 (lb/MMBtu)
SV07	EU10	PM2.5	IC Engine 6 - Cummins - NT-855-GS - SKI	0.0479	AP-42 Table 3.4-2 (lb/MMBtu)
SV08	EU11	PM2.5	Boiler 5 - Cleaver Brooks - FLX-900 - Heart H	7.60	AP-42 Section 1.4 (lb/MMSCF)
SV08	EU12	PM2.5	Boiler 6 - Cleaver Brooks - FLX-900 - Heart H	7.60	AP-42 Section 1.4 (lb/MMSCF)
SV08	EU13	PM2.5	Boiler 7 - Cleaver Brooks - FLX-900 - Heart H	7.60	AP-42 Section 1.4 (lb/MMSCF)
SV08	EU14	PM2.5	Boiler 8 - Cleaver Brooks - FLX-900 - Heart H	7.60	AP-42 Section 1.4 (lb/MMSCF)
SV09	EU15	PM2.5	IC Engine 7 - Cummins - QST30-G1 - Heart	0.0479	AP-42 Table 3.4-2 (lb/MMBtu)
SV10	EU16	PM2.5	IC Engine 8 - Cummins - QST30-G1 - Heart	0.0479	AP-42 Table 3.4-2 (lb/MMBtu)
SV11	EU17	PM2.5	IC Engine 9 - Cummins - QST30-G1 - Heart	0.0479	AP-42 Table 3.4-2 (lb/MMBtu)

Stack Vent ID	Emission Unit	Pollutant	Description	Emission Factor	Emission Factors References/Assumptions/Equations Used to generate short - term emission rate
SV12	EU18	PM2.5	IC Engine 10 - Caterpillar - 3306B - Parking 0	0.0479	AP-42 Table 3.4-2 (lb/MMBtu)
SV13	EU19	PM2.5	Raypak Boiler - Raypac - H34001 - Parking 0	7.60	AP-42 Section 1.4 (lb/MMSCF)
SV14	EU20	PM2.5	Raypak Boiler - Raypac - H34001 - Parking 0	7.60	AP-42 Section 1.4 (lb/MMSCF)
SV15	EU21	PM2.5	NEW BOILER #1 - Hydratherm - KN-30 - 10th A	7.60	AP-42 Section 1.4 (lb/MMSCF)
SV16	EU22	PM2.5	NEW BOILER #2 - Hydratherm - KN-30 - 10th A	7.60	AP-42 Section 1.4 (lb/MMSCF)
SV17	EU23	PM2.5	NEW BOILER #3 - Hydratherm - KN-30 - 10th A	7.60	AP-42 Section 1.4 (lb/MMSCF)
SV18	EU24	PM2.5	NEW BOILER #4 - Hydratherm - KN-30 - 10th A	7.60	AP-42 Section 1.4 (lb/MMSCF)
SV19	EU25	PM2.5	NEW BOILER #6 - Lattner - WLF - 40 - 10th A	7.60	AP-42 Section 1.4 (lb/MMSCF)
SV20	EU26	PM2.5	NEW BOILER #7 - Lattner - WLF - 40 - 10th A	7.60	AP-42 Section 1.4 (lb/MMSCF)
SV21	EU27	PM2.5	NEW GEN #1 - Caterpillar - DM8263 - 10th A	0.0479	AP-42 Table 3.4-2 (lb/MMBtu)
SV22	EU28	PM2.5	NEW BOILER #5 - Hydratherm - KN-30 - 10th A	7.60	AP-42 Section 1.4 (lb/MMSCF)



**Minnesota Pollution  
Control Agency**

520 Lafayette Road North  
St. Paul, MN 55155-4194

# AQDMPS-01

## Air Quality Dispersion Modeling (AQDM) Protocol Spreadsheet Protocol Form for Criteria Pollutant Modeling

Doc Type: Air Dispersion Modeling

AQ Facility ID No:	05300061
Facility Name:	Abbott
Facility Address:	800 28th Street
Facility Contact:	Mr. Timothy B. Grote

Stack Vent ID	Emission Unit	Pollutant	Description	Emission Factor	Emission Factors References/Assumptions/Equations
SV001	EU001	NO <sub>2</sub>	Emergency Power Generator Concentrator - Diesel	0.01	Used to generate short - term emission rate 1,200 kW capacity provided by vendor x 1.341 hp/kW = 1,609 hp lb/hp-hr emission factors from AP-42 'Large Stationary Diesel And All Stationary Dual-fuel Engines'

### Emission Calculations Table

Stack Vent ID	Emission Unit	Pollutant	Description	Emission Factor	Emission Factors References/Assumptions/Equations
SV01	EU01	NO2	Boiler 1 - Bros - W2-37 - Main Campus	20.00	AP-42 Section 1.3 (lb/1000 gal)
SV01	EU02	NO2	Boiler 2 - Bros - W2-37 - Main Campus	20.00	AP-42 Section 1.3 (lb/1000 gal)
SV01	EU03	NO2	Boiler 3 - Bros - W2-37 - Main Campus	20.00	AP-42 Section 1.3 (lb/1000 gal)
SV01	EU04	NO2	Boiler 4 - Cleaver Brooks - WT 439X-CN6 - Main	20.00	AP-42 Section 1.3 (lb/1000 gal)
SV02	EU05	NO2	IC Engine 1 - Cummins - VT-1710-GS - Main	3.2	AP-42 Section 3.4 (lb/MMBtu)
SV03	EU06	NO2	IC Engine 2 - Cummins - VT-1710-GS - Main	3.2	AP-42 Section 3.4 (lb/MMBtu)
SV04	EU07	NO2	IC Engine 3 - Cummins - KTTA 19-G1 - Main	3.2	AP-42 Section 3.4 (lb/MMBtu)
SV05	EU08	NO2	IC Engine 4 - Onan - KTTA 19-G1 - Main	3.2	AP-42 Section 3.4 (lb/MMBtu)
SV06	EU09	NO2	IC Engine 5 - Onan - VTA-28 G2 - Main	3.2	AP-42 Section 3.4 (lb/MMBtu)
SV07	EU10	NO2	IC Engine 6 - Cummins - NT-855-GS - SKI	3.2	AP-42 Section 3.4 (lb/MMBtu)
SV08	EU11	NO2	Boiler 5 - Cleaver Brooks - FLX-900 - Heart	20.00	AP-42 Section 1.3 (lb/1000 gal)
SV08	EU12	NO2	Boiler 6 - Cleaver Brooks - FLX-900 - Heart	20.00	AP-42 Section 1.3 (lb/1000 gal)
SV08	EU13	NO2	Boiler 7 - Cleaver Brooks - FLX-900 - Heart	20.00	AP-42 Section 1.3 (lb/1000 gal)
SV08	EU14	NO2	Boiler 8 - Cleaver Brooks - FLX-900 - Heart	20.00	AP-42 Section 1.3 (lb/1000 gal)
SV09	EU15	NO2	IC Engine 7 - Cummins - QST30-G1 - Heart	3.2	AP-42 Section 3.4 (lb/MMBtu)
SV10	EU16	NO2	IC Engine 8 - Cummins - QST30-G1 - Heart	3.2	AP-42 Section 3.4 (lb/MMBtu)
SV11	EU17	NO2	IC Engine 9 - Cummins - QST30-G1 - Heart	3.2	AP-42 Section 3.4 (lb/MMBtu)

Stack Vent ID	Emission Unit	Pollutant	Description	Emission Factor	Emission Factors References/Assumptions/Equations Used to generate short - term emission rate
SV12	EU18	NO2	IC Engine 10 - Caterpillar - 3306B - Parking 0	3.2	AP-42 Section 3.4 (lb/MMBtu)
SV13	EU19	NO2	Raypak Boiler - Raypac - H34001 - Parking 0	100.00	AP-42 Section 1.4 (lb/MMSCF)
SV14	EU20	NO2	Raypak Boiler - Raypac - H34001 - Parking 0	100.00	AP-42 Section 1.4 (lb/MMSCF)
SV15	EU21	NO2	NEW BOILER #1 - Hydratherm - KN-30 - 10th A	100.00	AP-42 Section 1.4 (lb/MMSCF)
SV16	EU22	NO2	NEW BOILER #2 - Hydratherm - KN-30 - 10th A	100.00	AP-42 Section 1.4 (lb/MMSCF)
SV17	EU23	NO2	NEW BOILER #3 - Hydratherm - KN-30 - 10th A	100.00	AP-42 Section 1.4 (lb/MMSCF)
SV18	EU24	NO2	NEW BOILER #4 - Hydratherm - KN-30 - 10th A	100.00	AP-42 Section 1.4 (lb/MMSCF)
SV19	EU25	NO2	NEW BOILER #6 - Lattner - WLF - 40 - 10th A	100.00	AP-42 Section 1.4 (lb/MMSCF)
SV20	EU26	NO2	NEW BOILER #7 - Lattner - WLF - 40 - 10th A	100.00	AP-42 Section 1.4 (lb/MMSCF)
SV21	EU27	NO2	NEW GEN #1 - Caterpillar - DM8263 - 10th A	3.2	AP-42 Section 3.4 (lb/MMBtu)
SV22	EU28	NO2	NEW BOILER #5 - Hydratherm - KN-30 - 10th A	100.00	AP-42 Section 1.4 (lb/MMSCF)



**Minnesota Pollution  
Control Agency**

520 Lafayette Road North  
St. Paul, MN 55155-4194

# AQDMPS-01

## Air Quality Dispersion Modeling (AQDM) Protocol Spreadsheet Protocol Form for Criteria Pollutant Modeling

Doc Type: Air Dispersion Modeling

AQ Facility ID No:	05300061
Facility Name:	Abbott
Facility Address:	800 28th Street
Facility Contact:	Mr. Timothy B. Grote

Stack Vent ID	Emission Unit	Pollutant	Description	Emission Factor	Emission Factors References/Assumptions/Equations
SV001	EU001	NO <sub>2</sub>	Emergency Power Generator Concentrator - Diesel	0.01	Used to generate short - term emission rate 1,200 kW capacity provided by vendor x 1.341 hp/kW = 1,609 hp lb/hp-hr emission factors from AP-42 'Large Stationary Diesel And All Stationary Dual-fuel Engines'

### Emission Calculations Table

Stack Vent ID	Emission Unit	Pollutant	Description	Emission Factor	Emission Factors References/Assumptions/Equations
SV01	EU01	SO2	Boiler 1 - Bros - W2-37 - Main Campus	7.10	AP-42 Section 1.3 (lb/1000 gal) Sulfur=0.05%
SV01	EU02	SO2	Boiler 2 - Bros - W2-37 - Main Campus	7.10	AP-42 Section 1.3 (lb/1000 gal) Sulfur=0.05%
SV01	EU03	SO2	Boiler 3 - Bros - W2-37 - Main Campus	7.10	AP-42 Section 1.3 (lb/1000 gal) Sulfur=0.05%
SV01	EU04	SO2	Boiler 4 - Cleaver Brooks - WT 439X-CN6 - Main	7.10	AP-42 Section 1.3 (lb/1000 gal) Sulfur=0.05%
SV02	EU05	SO2	IC Engine 1 - Cummins - VT-1710-GS - Main	0.00152	AP-42 Section 3.4 (lb/MMBtu), Sulfur = 0.0015%
SV03	EU06	SO2	IC Engine 2 - Cummins - VT-1710-GS - Main	0.00152	AP-42 Section 3.4 (lb/MMBtu), Sulfur = 0.0015%
SV04	EU07	SO2	IC Engine 3 - Cummins - KTTA 19-G1 - Main	0.00152	AP-42 Section 3.4 (lb/MMBtu), Sulfur = 0.0015%
SV05	EU08	SO2	IC Engine 4 - Onan - KTTA 19-G1 - Main	0.00152	AP-42 Section 3.4 (lb/MMBtu), Sulfur = 0.0015%
SV06	EU09	SO2	IC Engine 5 - Onan - VTA-28 G2 - Main	0.00152	AP-42 Section 3.4 (lb/MMBtu), Sulfur = 0.0015%
SV07	EU10	SO2	IC Engine 6 - Cummins - NT-855-GS - SKI	0.00152	AP-42 Section 3.4 (lb/MMBtu), Sulfur = 0.0015%
SV08	EU11	SO2	Boiler 5 - Cleaver Brooks - FLX-900 - Heart	7.10	AP-42 Section 1.3 (lb/1000 gal) Sulfur=0.05%
SV08	EU12	SO2	Boiler 6 - Cleaver Brooks - FLX-900 - Heart	7.10	AP-42 Section 1.3 (lb/1000 gal) Sulfur=0.05%
SV08	EU13	SO2	Boiler 7 - Cleaver Brooks - FLX-900 - Heart	7.10	AP-42 Section 1.3 (lb/1000 gal) Sulfur=0.05%
SV08	EU14	SO2	Boiler 8 - Cleaver Brooks - FLX-900 - Heart	7.10	AP-42 Section 1.3 (lb/1000 gal) Sulfur=0.05%
SV09	EU15	SO2	IC Engine 7 - Cummins - QST30-G1 - Heart	0.00152	AP-42 Section 3.4 (lb/MMBtu), Sulfur = 0.0015%
SV10	EU16	SO2	IC Engine 8 - Cummins - QST30-G1 - Heart	0.00152	AP-42 Section 3.4 (lb/MMBtu), Sulfur = 0.0015%
SV11	EU17	SO2	IC Engine 9 - Cummins - QST30-G1 - Heart	0.00152	AP-42 Section 3.4 (lb/MMBtu), Sulfur = 0.0015%



Stack Vent ID	Emission Unit	Pollutant	Description	Emission Factor	Emission Factors References/Assumptions/Equations Used to generate short - term emission rate
SV12	EU18	SO2	IC Engine 10 - Caterpillar - 3306B - Parking 0	0.00152	AP-42 Section 3.4 (lb/MMBtu), Sulfur = 0.0015%
SV13	EU19	SO2	Raypak Boiler - Raypac - H34001 - Parking 0	0.60	AP-42 Section 1.4 (lb/MMSCF)
SV14	EU20	SO2	Raypak Boiler - Raypac - H34001 - Parking 0	0.60	AP-42 Section 1.4 (lb/MMSCF)
SV15	EU21	SO2	NEW BOILER #1 - Hydratherm - KN-30 - 10th A	0.60	AP-42 Section 1.4 (lb/MMSCF)
SV16	EU22	SO2	NEW BOILER #2 - Hydratherm - KN-30 - 10th A	0.60	AP-42 Section 1.4 (lb/MMSCF)
SV17	EU23	SO2	NEW BOILER #3 - Hydratherm - KN-30 - 10th A	0.60	AP-42 Section 1.4 (lb/MMSCF)
SV18	EU24	SO2	NEW BOILER #4 - Hydratherm - KN-30 - 10th A	0.60	AP-42 Section 1.4 (lb/MMSCF)
SV19	EU25	SO2	NEW BOILER #6 - Lattner - WLF - 40 - 10th A	0.60	AP-42 Section 1.4 (lb/MMSCF)
SV20	EU26	SO2	NEW BOILER #7 - Lattner - WLF - 40 - 10th A	0.60	AP-42 Section 1.4 (lb/MMSCF)
SV21	EU27	SO2	NEW GEN #1 - Caterpillar - DM8263 - 10th A	0.00152	AP-42 Section 3.4 (lb/MMBtu), Sulfur = 0.0015%
SV22	EU28	SO2	NEW BOILER #5 - Hydratherm - KN-30 - 10th A	0.60	AP-42 Section 1.4 (lb/MMSCF)

**APPENDIX C**  
**MPCA –AIR QUALITY DISPERSION MODELING REPORT (AQDMR) FORM QDMR-01**



**Minnesota Pollution  
Control Agency**

520 Lafayette Road North  
St. Paul, MN 55155-4194

**AQDMR-01**

**Air Quality Dispersion Modeling Report(AQDMR)  
Protocol Form for Criteria Pollutant Modeling**

*Doc Type: Air Dispersion Modeling*

**Acronym Information on Page 6**

**Instructions:** Permit applicants required to conduct air dispersion modeling should submit two paper copies of the completed Air Quality Dispersion Modeling Report form (AQDMR-01) and all accompanying files to:

Air Quality Permit Document Coordinator  
Minnesota Pollution Control Agency  
520 Lafayette Road North  
St. Paul, MN 55155-4194

Applicants may also submit an electronic version in addition to the two paper copies.

Electronic copies of the forms and accompanying files should be sent to: [AirModeling.PCA@state.mn.us](mailto:AirModeling.PCA@state.mn.us).

**Facility Information**

AQ tracking number: \_\_\_\_\_

AQ file no.: 253 AQ facility/permit ID no.: 05300061 Today's date (mm/dd/yyyy): 3/26/12

Three-letter modeling facility ID (ex., XEK = Xcel Energy Allen S. King, MEC = Mankato Energy Center, etc.): ANW

Facility name: Abbott Northwestern Hospital

Facility street address: 800 28<sup>th</sup> St East

City: Minneapolis County: Hennepin

State: MN Zip code: 55407 Elevation at facility: 262.1 m

Facility contact: Mr. Timothy B. Grote Protocol prepared by: Mr. Ryan Birkenholz

Facility contact phone: 612-863-4164 Preparer phone: 651-697-9737

Facility contact e-mail address: tim.grote@allina.com Preparer e-mail address: rbirkenholz@golder.com

Latitude, Longitude of facility (Decimal degrees to **four** decimal places): 44.953177 N, 93.261375 W

UTM coordinates of facility (NAD83, zone 15 extended **only**): x = 479,383.00 m East, y = 4,977,783.00 m North

**This report is associated with:**

- ☒ Permit application  
☐ Permit requirement  
☐ Other: \_\_\_\_\_

**Project Description (50 words or less)**

This modeling report is required by Minnesota Statute 116.07 Subd 4a in connection with an air permit modification.

**Files to Accompany Modeling Report**

Include the following files with the completed modeling report form. Use checkbox to indicate that all applicable files are included.

- ☒ AERMOD input files (\*.inp, \*.adi, \*.ami)  
☒ AERMOD output files (\*.out, \*.ado, \*.amo)  
☒ AERMOD plot files (\*.plt)  
☐ AERMOD post files (\*.pst) – If applicable  
☐ AERMOD event files (\*.evi, \*.evo) – If applicable

☐ AERMOD miscellaneous/other files (MAXDCONT, ?, ?, etc.) – If applicable

2. AERMET files: ☒ \*.sfc ☐ \*.pfl
3. BPIP-PRIME files: ☒ Input (\*.bpi) ☒ Output (\*.bpo, \*.sum)
4. AERMAP files: ☒ Terrain (\*.dem(s), \*.tif (NED files)), ☒ Input (\*.ami), ☒ Output (\*.rou, \*.sou, etc.)
5. Background data files: ☒ Background concentrations for applicable pollutants (seasonal, monthly, daily, hourly, etc.)
6. Modeling Results: ☒ Figures (\*.jpeg, \*.pdf), ☐ GIS Maps (\*.shp)
7. AQDMPS-01 spreadsheet\*: ☒
8. Other files and supporting documents (SMSv\*.xls, Far sources, readme, etc.):

\* Provide the final spreadsheet (i.e. AQDMPS-01) and indicate/highlight changes.

## Section 1. Modeling Protocol

1. The Air Dispersion Modeling presented in this report is based on a Protocol that has been:

☒ Approved ☐ Conditionally approved ☒ \*MPCA approval date (mm/dd/yyyy): 12/19/2011

*\*This is the date given on AQDM PAN-01 form*

2. Does this Modeling submittal **completely** follow the Approved Protocol? ☐ Yes ☒ No

If yes, proceed to Section 3.

If no, proceed to Section 2.

## Section 2. Changes to Modeling Protocol

**Table 1: Protocol Changes** (Please indicate which sections in Approved Protocol contain changes.)

Modeling protocol by sections	
Section and section name	Change/No change
Files to accompany protocol	No Change
Section A <i>Purpose for Air Dispersion Modeling and Related Information</i>	No Change
Section B <i>EPA Pre-Processors and EPA Post-Processors</i>	No Change
Section C <i>Model Selection and Options (Key CO Pathway Inputs)</i>	No Change
Section D <i>Emission Source Characterizations and Parameters (Key SO Pathway Inputs)</i>	Change
Section E <i>Paved Roads Fugitive Dust (as per MPCA April 25, 2011 Policy)</i>	No Change
Section F <i>Receptors (RE Pathway)</i>	Change
Section G <i>Meteorological Data (ME Pathway)</i>	No Change
Section H <i>SIL Analysis and Results</i>	Change
Section I <i>Background Values</i>	No Change
Section J <i>Nearby Sources</i>	No Change
Section K <i>Anticipated Outputs (OU Pathway)</i>	No Change

## Section 2.1: Detailed Changes to Modeling Protocol

---

Please provide specific information corresponding to those sections in Table 1 where changes are indicated.

Changes to Sections D, F, and H are consistent with the comments on the protocol approval form AQDMPRF-01 dated 12/19/2011.

### Section A. Purpose for air dispersion modeling and related information

---

MPCA approved change: ☐ Yes ☐ No Date (mm/dd/yyyy): \_\_\_\_\_

Describe changes and/or indicate section item number(s):

### Section B. EPA pre-processors and EPA post-processors

---

MPCA approved change: ☐ Yes ☐ No Date (mm/dd/yyyy): \_\_\_\_\_

Describe changes and/or indicate section item number(s):

### Section C. Model selection and options (Key CO pathway inputs)

---

MPCA approved change: ☐ Yes ☐ No Date (mm/dd/yyyy): \_\_\_\_\_

Describe changes and/or indicate section item number(s):

### Section D. Emission source characterizations and parameters (Key SO pathway inputs)

---

MPCA approved change: ☐ Yes ☒ No Date (mm/dd/yyyy): \_\_\_\_\_

Describe changes and/or indicate section item number(s):

Emission rates changed since the protocol was last approved and are highlighted in MPCA form ADQMPS-01

### Section E. Paved roads fugitive dust

---

MPCA approved change: ☐ Yes ☐ No Date (mm/dd/yyyy): \_\_\_\_\_

Describe changes and/or indicate section item number(s):

### Section F. Receptors (RE pathway)

---

MPCA approved change: ☐ Yes ☒ No Date (mm/dd/yyyy): \_\_\_\_\_

Describe changes and/or indicate section item number(s):

Flagpole receptors are included for refined models.

### Section G. Meteorological data (ME pathway)

---

MPCA approved change: ☐ Yes ☐ No Date (mm/dd/yyyy): \_\_\_\_\_

Describe changes and/or indicate section item number(s):

### Section H. SIL analysis and results

---

MPCA approved change: ☐ Yes ☒ No Date (mm/dd/yyyy): \_\_\_\_\_

Describe changes and/or indicate section item number(s):

The original protocol listed the SIR to be 0 km for PM<sub>2.5</sub>. This was not an error. The actual SIR is 0.4 km, but the form does not allow decimals.

## Section I. Background values

MPCA approved change: ☐ Yes ☐ No Date (mm/dd/yyyy): \_\_\_\_\_

Describe changes and/or indicate section item number(s):

## Section J. Nearby sources

MPCA approved change: ☐ Yes ☐ No Date (mm/dd/yyyy): \_\_\_\_\_

Describe changes and/or indicate section item number(s):

## Section K. Anticipated outputs (OU pathway)

MPCA approved change: ☐ Yes ☐ No Date (mm/dd/yyyy): \_\_\_\_\_

Describe changes and/or indicate section item number(s):

## Section 3. Paved Roads Fugitive Dust (Optional)

Facilities that have indicated in AQDMP-01 form the exclusion of paved roads in the air dispersion modeling should provide the results of that modeling in Table 1. (See the AQDMP-01 form for details.)

**Table 1: Paved Road Dust modeling results**

	Averaging Period	NAAQS (µg/m <sup>3</sup> )	Total Modeled NAAQS Concentration (includes Background and Nearby Sources) (ug/m <sup>3</sup> )	% of NAAQS	PSD Class II Increments (µg/m <sup>3</sup> )	Modeled Class II Increment Impact Concentrations (µg/m <sup>3</sup> )	% of Class II Increments
PM <sub>10</sub>	24-hour	150		0.00%	30		0.00%
	Annual	50		0.00%	17		0.00%
PM <sub>2.5</sub>	24-hour	35		0.00%	9		0.00%
	Annual	15		0.00%	4		0.00%

## Section 4. Modeling Results

**Table 2: Pollutants and averaging periods** (Indicate with an "X" all pollutant and averaging period(s) modeled.)

Pollutant	Averaging Period	Standard		Increment
		NAAQS	MAAQs	
CO	1-hr	X	X	
	8-hr	X	X	
Lead	Rolling 3 mo. Avg	X	X	
	Quarterly Avg			
NO <sub>2</sub>	1-hr	X	X	
	Annual	X	X	
SO <sub>2</sub>	1-hr	X	X	
	3-hr	X	X	
	24-hr	X	X	

	Annual	X	X	
PM <sub>10</sub>	24-hr	X	X	
	Annual	X	X	
PM <sub>2.5</sub>	24-hr	X	X	
	Annual	X	X	

**Table 3: NAAQS/MAAQS modeling results** (Enter modeling results along with the percent of standard.)

Pollutant	Averaging period	NAAQS standard (ug/m <sup>3</sup> )	MAAQS standard (ug/m <sup>3</sup> )	Total modeled concentration (includes background and nearby sources) (ug/m <sup>3</sup> )	Percent of standard (%)	
					NAAQS	MAAQS
CO	1-hr	40,000	35,000	<SIL		
	8-hr	10,000	10,000	<SIL		
Lead	Rolling 3 mo. Avg	0.15	***	0.00065 (month)	0.4%	
	Quarterly Avg	1.5	1.5	0.00065 (month)	0.04%	0.04%
NO <sub>2</sub>	1-hr	188	***	442	235%	
	Annual	100	100	48.8	49%	49%
SO <sub>2</sub>	1-hr	196	1300	<SIL		
	3-hr	***	1300/*915	<SIL		
	24-hr	365	365	<SIL		
	Annual	80	60	<SIL		
PM <sub>10</sub>	24-hr	150	150	<SIL		
	Annual	***	50	<SIL		
PM <sub>2.5</sub>	24-hr	35	65	34.0	97%	52%
	Annual	15	15	13.0	87%	87%

\*SO<sub>2</sub> 3-hr for Northern Minnesota is 915 ug/m<sup>3</sup>.

**Table 4: Increment modeling results** (Provide the increment modeling results along with the percent of standard.)

Pollutant	Averaging Period	Class II Increment (ug/m <sup>3</sup> )	Total Modeled Concentration (includes other increment sources) (ug/m <sup>3</sup> )	Percent of Standard (%)
NO <sub>2</sub>	1-hr	***		
	Annual	25		
SO <sub>2</sub>	1-hr	***		
	3-hr	512		
	24-hr	91		
	Annual	20		
PM <sub>10</sub>	24-hr	30		
	Annual	17		
PM <sub>2.5</sub>	24-hr	9		
	Annual	4		

## Section 5. Discussion

Enter any discussion comments:

See attached disperison modeling report for discussion. Modeled concentration of 442 µg/m<sup>3</sup> for 1-hr NO<sub>2</sub> is due to background. This Facility does not cause or contribute to a modeled NAAQS exceedance.

## Section 6. Modeling Results Figures/Maps

Insert a figure or map showing the facility emission sources, receptors, and the location of the modeled maximum concentration(s) for each applicable pollutant, corresponding averaging periods, and operating scenarios. Figures or maps should correspond to Section 3 NAAQS and Increment results.

See Model Report





**Minnesota Pollution  
Control Agency**

520 Lafayette Road North  
St. Paul, MN 55155-4194

# AQDMPS-01

## Air Quality Dispersion Modeling (AQDM) Protocol Spreadsheet Protocol Form for Criteria Pollutant Modeling

Doc Type: Air Dispersion Modeling

AQ Facility ID No:	05300061
Facility Name:	Abbott
Facility Address:	800 28th Street
Facility Contact:	Mr. Timothy B. Grote

Stack Vent ID	Emission Unit	Pollutant	Description	Emission Factor	Emission Factors References/Assumptions/Equations
SV001	EU001	NO <sub>2</sub>	Emergency Power Generator Concentrator - Diesel	0.01	Used to generate short - term emission rate 1,200 kW capacity provided by vendor x 1.341 hp/kW = 1,609 hp lb/hp-hr emission factors from AP-42 'Large Stationary Diesel And All Stationary Dual-fuel Engines'

### Emission Calculations Table

Stack Vent ID	Emission Unit	Pollutant	Description	Emission Factor	Emission Factors References/Assumptions/Equations
SV01	EU01	SO2	Boiler 1 - Bros - W2-37 - Main Campus	0.21	AP-42 Section 1.3 (lb/1000 gal) Sulfur=0.0015%
SV01	EU02	SO2	Boiler 2 - Bros - W2-37 - Main Campus	0.21	AP-42 Section 1.3 (lb/1000 gal) Sulfur=0.0015%
SV01	EU03	SO2	Boiler 3 - Bros - W2-37 - Main Campus	0.21	AP-42 Section 1.3 (lb/1000 gal) Sulfur=0.0015%
SV01	EU04	SO2	Boiler 4 - Cleaver Brooks - WT 439X-CN6 - Main Campus	0.21	AP-42 Section 1.3 (lb/1000 gal) Sulfur=0.0015%
SV02	EU05	SO2	IC Engine 1 - Cummins - VT-1710-GS - Mair	0.00152	AP-42 Section 3.4 (lb/MMBtu), Sulfur = 0.0015%
SV03	EU06	SO2	IC Engine 2 - Cummins - VT-1710-GS - Mair	0.00152	AP-42 Section 3.4 (lb/MMBtu), Sulfur = 0.0015%
SV04	EU07	SO2	IC Engine 3 - Cummins - KTTA 19-G1 - Mair	0.00152	AP-42 Section 3.4 (lb/MMBtu), Sulfur = 0.0015%
SV05	EU08	SO2	IC Engine 4 - Onan - KTTA 19-G1 - Main Campus	0.00152	AP-42 Section 3.4 (lb/MMBtu), Sulfur = 0.0015%
SV06	EU09	SO2	IC Engine 5 - Onan - VTA-28 G2 - Main Campus	0.00152	AP-42 Section 3.4 (lb/MMBtu), Sulfur = 0.0015%
SV07	EU10	SO2	IC Engine 6 - Cummins - NT-855-GS - SKI	0.00152	AP-42 Section 3.4 (lb/MMBtu), Sulfur = 0.0015%
SV08	EU11	SO2	Boiler 5 - Cleaver Brooks - FLX-900 - Heartland	0.21	AP-42 Section 1.3 (lb/1000 gal) Sulfur=0.0015%
SV08	EU12	SO2	Boiler 6 - Cleaver Brooks - FLX-900 - Heartland	0.21	AP-42 Section 1.3 (lb/1000 gal) Sulfur=0.0015%
SV08	EU13	SO2	Boiler 7 - Cleaver Brooks - FLX-900 - Heartland	0.21	AP-42 Section 1.3 (lb/1000 gal) Sulfur=0.0015%
SV08	EU14	SO2	Boiler 8 - Cleaver Brooks - FLX-900 - Heartland	0.21	AP-42 Section 1.3 (lb/1000 gal) Sulfur=0.0015%
SV09	EU15	SO2	IC Engine 7 - Cummins - QST30-G1 - Heartland	0.00152	AP-42 Section 3.4 (lb/MMBtu), Sulfur = 0.0015%
SV10	EU16	SO2	IC Engine 8 - Cummins - QST30-G1 - Heartland	0.00152	AP-42 Section 3.4 (lb/MMBtu), Sulfur = 0.0015%
SV11	EU17	SO2	IC Engine 9 - Cummins - QST30-G1 - Heartland	0.00152	AP-42 Section 3.4 (lb/MMBtu), Sulfur = 0.0015%

Stack Vent ID	Emission Unit	Pollutant	Description	Emission Factor	Emission Factors References/Assumptions/Equations Used to generate short - term emission rate
SV12	EU18	SO2	IC Engine 10 - Caterpillar - 3306B - Parking	0.00152	AP-42 Section 3.4 (lb/MMBtu), Sulfur = 0.0015%
SV13	EU19	SO2	Raypak Boiler - Raypac - H34001 - Parking	0.60	AP-42 Section 1.4 (lb/MMSCF)
SV14	EU20	SO2	Raypak Boiler - Raypac - H34001 - Parking	0.60	AP-42 Section 1.4 (lb/MMSCF)
SV15	EU21	SO2	LAB BOILER #1 - Hydratherm - KN-30 - 10th	0.60	AP-42 Section 1.4 (lb/MMSCF)
SV16	EU22	SO2	LAB BOILER #2 - Hydratherm - KN-30 - 10th	0.60	AP-42 Section 1.4 (lb/MMSCF)
SV17	EU23	SO2	LAB BOILER #3 - Hydratherm - KN-30 - 10th	0.60	AP-42 Section 1.4 (lb/MMSCF)
SV18	EU24	SO2	LAB BOILER #4 - Hydratherm - KN-30 - 10th	0.60	AP-42 Section 1.4 (lb/MMSCF)
SV19	EU25	SO2	LAB BOILER #6 - Lattner - WLF - 40 - 10th	0.60	AP-42 Section 1.4 (lb/MMSCF)
SV20	EU26	SO2	LAB BOILER #7 - Lattner - WLF - 40 - 10th	0.60	AP-42 Section 1.4 (lb/MMSCF)
SV21	EU27	SO2	LAB GEN #1 - Caterpillar - DM8263 - 10th	0.00152	AP-42 Section 3.4 (lb/MMBtu), Sulfur = 0.0015%
SV22	EU28	SO2	LAB BOILER #5 - Hydratherm - KN-30 - 10th	0.60	AP-42 Section 1.4 (lb/MMSCF)



# Air Quality Dispersion Modeling (AQDM) Protocol Spreadsheet

AQ Facility ID No:	05300061
Facility Name:	Abbott
Facility Address:	800 28th Street
Facility Contact:	Mr. Timothy B. Grote

Parameters	Units	Description
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Parameters	Units	Description
Type =		POINT, AREA, AREA_CIRC, AREA_POLY, VOLUME, OPEN_PIT e.g. a stack = POINT, parking lot = AREA
ID =		Source ID up to 8 characters
Base_Elev =	[m]	Source base elevation above mean sea level
Height =	[m]	Release height above ground
Diam =	[m]	Stack/Area diameter (POINT and AREA_CIRC only)
Exit_Val =	[m/s]	Exit velocity (POINT only)
Exit_Temp =	[K]	Exit temperature (POINT only)
Release_Type =		VERTICAL, HORIZONTAL, CAPPED (POINT only) - HORIZONTAL and CAPPED are non-default beta options
Emission_Rate =	[g/s or g/s/m <sup>2</sup> ]	Emission rate (g/s for POINT and VOLUME, g/s/m <sup>2</sup> for all AREA and OPENPIT)
X and Y	[m]	Stack Coordinates in UTM NAD83
Desc =		Stack description (boiler, furnace, etc)

## SRCPARAM

SRCPARAM												
Stack Vent ID	Pollutant	Base_Elev [m]	Height [m]	Diam [m]	Exit_Vel [m/s]	Exit_Temp [K]	Release_Type	Emission_Rate (g/sec)	Easting		Northing	
									X1	Y1	DESC	
SV001	NO <sub>2</sub>	450.31	48.77	5.77	15.31	327.6	VERTICAL	149	495489.98	5251009.25		Hood Exhaust
SV001	PM <sub>2.5</sub>	450.31	47.57	5.47	15.31	327.35	VERTICAL	0.005	495494.98	5251011.25		Emergency power generator
SV003	PM <sub>2.5</sub>	450.31	46.37	5.17	15.31	327.1	VERTICAL	10	495499.98	5251013.25		Emergency power generator

## Stack Parameter Input Table

Stack Vent	Pollutant	Base Elev [m]	Height [m]	Diam [m]	Exit_Vel [m/s]	Exit_Temp [K]	Release_Type	Emission_Rate (g/sec)	Emission_Rate (lb/hr)	Easting		Northing	
										X1	Y1	[m]	[m]
ID													
ANW_SV01	CO	262.13	30.48	1.829	11.083	546.483333	VERTICAL	1.7017	13.506	479307.36	497968.18	GP01, EU01-04 Main Campus Boilers (common stack)	
ANW_SV02	CO	262.13	6.1	0.203	52.391	785.927778	VERTICAL	0.4879	3.872	479346.1	497959.35	GP02, EU05 IC Engine 685 hp Cummins (emergency use only)	
ANW_SV03	CO	262.13	6.1	0.203	52.391	785.927778	VERTICAL	0.4879	3.872	479347.71	497959.35	GP02, EU06 IC Engine 685 hp Cummins (emergency use only)	
ANW_SV04	CO	262.13	6.1	0.203	52.828	763.705556	VERTICAL	0.5489	4.356	479357.97	497959.11	GP02, EU07 IC Engine 685 hp Cummins (emergency use only)	

Stack Parameter Input Table

Stack Vent ID	Pollutant	Base Elev [m]	Height [m]	Diam [m]	Exit Vel [m/s]	Exit Temp [K]	Release_Type	Emission_Rate (g/sec)	Emission_Rate (lb/hr)	Northing	
										X1 [m]	Y1 [m]
ANW_SV05	CO	262.13	9.14	0.203	52.828	763.705556	VERTICAL	0.5489	4.356	479321.27	4977966.22
ANW_SV06	CO	262.13	10.67	0.203	56.135	783.15	VERTICAL	0.7318	5.808	479324.85	4977974.6
ANW_SV07	CO	262.13	6.1	0.127	118.847	799.816667	VERTICAL	0.2864	2.273	479343.18	4977754.78
ANW_SV08	CO	262.13	41.15	0.762	12.4187	544.261111	VERTICAL	0.1613	1.280	479456.73	4977937.75
ANW_SV09	CO	262.13	10.97	0.279	47.55	752.594444	VERTICAL	0.6672	5.295	479452.65	4977933.37
ANW_SV10	CO	262.13	10.97	0.279	47.55	752.594444	VERTICAL	0.6672	5.295	479453.25	4977934.09
ANW_SV11	CO	262.13	10.97	0.279	47.55	752.594444	VERTICAL	0.6672	5.295	479453.87	4977934.78
ANW_SV12	CO	262.13	9.14	0.152	56.272	807.594444	VERTICAL	0.251	1.992	479392.21	4977625.33
ANW_SV13	CO	262.13	30.48	1.067	0.573	449.816667	VERTICAL	0.0423	0.336	479467.83	4977548.34
ANW_SV14	CO	262.13	30.48	1.067	0.573	449.816667	VERTICAL	0.0423	0.336	479467.88	4977549.82
ANW_SV15	CO	262.13	36.3	0.229	0.001	355	VERTICAL	0.0318	0.252	479398.8	4977568.49
ANW_SV16	CO	262.13	36.3	0.229	0.001	355	VERTICAL	0.0318	0.252	479398.81	4977566.61
ANW_SV17	CO	262.13	36.3	0.229	0.001	355	VERTICAL	0.0318	0.252	479398.83	4977564.7
ANW_SV18	CO	262.13	36.3	0.229	0.001	355	VERTICAL	0.0318	0.252	479398.82	4977562.8
ANW_SV19	CO	262.13	35.97	0.305	2.75178	422.038889	VERTICAL	0.0177	0.140	479398.82	4977559.21
ANW_SV20	CO	262.13	35.97	0.305	2.75178	422.038889	VERTICAL	0.0177	0.140	479398.83	4977557.31
ANW_SV21	CO	262.13	9.14	0.305	98.907	673.15	VERTICAL	0.435	3.452	479392.19	4977626.48
ANW_SV22	CO	262.13	36.3	0.229	0.001	355.372222	VERTICAL	0.0318	0.252	479398.8	4977570.2
ANW_SV01	NO2	262.13	30.48	1.829	11.083	546.483333	VERTICAL	2.9519	23.428	479307.36	4977968.18
ANW_SV02	NO2	262.13	6.1	0.203	52.391	785.927778	VERTICAL	1.8368	14.578	479346.1	4977959.35
ANW_SV03	NO2	262.13	6.1	0.203	52.391	785.927778	VERTICAL	1.8368	14.578	479347.71	4977959.35
ANW_SV04	NO2	262.13	6.1	0.203	52.828	763.705556	VERTICAL	2.0665	16.401	479357.97	4977959.11
ANW_SV05	NO2	262.13	9.14	0.203	52.828	763.705556	VERTICAL	2.0665	16.401	479321.27	4977966.22
ANW_SV06	NO2	262.13	10.67	0.203	56.135	783.15	VERTICAL	2.7552	21.867	479324.85	4977974.6
ANW_SV07	NO2	262.13	6.1	0.127	118.847	799.816667	VERTICAL	1.3294	10.551	479343.18	4977754.78
ANW_SV08	NO2	262.13	41.15	0.762	12.4187	544.261111	VERTICAL	0.6451	5.120	479456.73	4977937.75
ANW_SV09	NO2	262.13	10.97	0.279	47.55	752.594444	VERTICAL	2.5119	19.936	479452.65	4977933.37
ANW_SV10	NO2	262.13	10.97	0.279	47.55	752.594444	VERTICAL	2.5119	19.936	479453.25	4977934.09
ANW_SV11	NO2	262.13	10.97	0.279	47.55	752.594444	VERTICAL	2.5119	19.936	479453.87	4977934.78
ANW_SV12	NO2	262.13	9.14	0.152	56.272	807.594444	VERTICAL	1.1651	9.247	479392.21	4977625.33
ANW_SV13	NO2	262.13	30.48	1.067	0.573	449.816667	VERTICAL	0.0504	0.400	479467.83	4977548.34
ANW_SV14	NO2	262.13	30.48	1.067	0.573	449.816667	VERTICAL	0.0504	0.400	479467.88	4977549.82
ANW_SV15	NO2	262.13	36.3	0.229	0.001	355	VERTICAL	0.0378	0.300	479398.8	4977568.49
ANW_SV16	NO2	262.13	36.3	0.229	0.001	355	VERTICAL	0.0378	0.300	479398.81	4977566.61
ANW_SV17	NO2	262.13	36.3	0.229	0.001	355	VERTICAL	0.0378	0.300	479398.83	4977564.7
ANW_SV18	NO2	262.13	36.3	0.229	0.001	355	VERTICAL	0.0378	0.300	479398.82	4977562.8
ANW_SV19	NO2	262.13	35.97	0.305	2.75178	422.038889	VERTICAL	0.0211	0.167	479398.82	4977559.21
ANW_SV20	NO2	262.13	35.97	0.305	2.75178	422.038889	VERTICAL	0.0211	0.167	479398.83	4977557.31
ANW_SV21	NO2	262.13	9.14	0.305	98.907	673.15	VERTICAL	5.3	42.064	479392.19	4977626.48
ANW_SV22	NO2	262.13	36.3	0.229	0.001	355.372222	VERTICAL	0.0378	0.300	479398.8	4977570.2
ANW_SV01	PM10	262.13	30.48	1.829	11.083	546.483333	VERTICAL	0.339	2.691	479307.36	4977968.18
ANW_SV02	PM10	262.13	6.1	0.203	52.391	785.927778	VERTICAL	0.0329	0.261	479346.1	4977959.35
ANW_SV03	PM10	262.13	6.1	0.203	52.391	785.927778	VERTICAL	0.0329	0.261	479347.71	4977959.35
ANW_SV04	PM10	262.13	6.1	0.203	52.828	763.705556	VERTICAL	0.037	0.294	479357.97	4977959.11
ANW_SV05	PM10	262.13	9.14	0.203	52.828	763.705556	VERTICAL	0.037	0.294	479321.27	4977966.22

Stack Parameter Input Table

Stack Vent ID	Pollutant	Base Elev [m]	Height [m]	Diam [m]	Exit_Vel [m/s]	Exit_Temp [K]	Release_Type	Emission_Rate (g/sec)	Emission_Rate (lb/hr)	Easting		Northing	
										X1 [m]	Y1 [m]	DESC	
ANW_SV06	PM10	262.13	10.67	0.203	56.135	783.15	VERTICAL	0.0493	0.391	479324.85	4977974.6	GP02, EU09 IC Engine 890 hp Onan (emergency use only)	
ANW_SV07	PM10	262.13	6.1	0.127	118.847	799.816667	VERTICAL	0.0935	0.742	479343.18	4977754.78	GP02, EU10 IC Engine 355 hp Cummins (emergency use only)	
ANW_SV08	PM10	262.13	41.15	0.762	12.4187	544.261111	VERTICAL	0.0742	0.589	479456.73	4977937.75	GP03, EU11-14 HH Boilers (common stack)	
ANW_SV09	PM10	262.13	10.97	0.279	47.55	752.594444	VERTICAL	0.045	0.357	479452.65	4977933.37	GP04, EU15 IC Engine 1135 hp Cummins (emergency use only)	
ANW_SV10	PM10	262.13	10.97	0.279	47.55	752.594444	VERTICAL	0.045	0.357	479453.25	4977934.09	GP04, EU16 IC Engine 1135 hp Cummins (emergency use only)	
ANW_SV11	PM10	262.13	10.97	0.279	47.55	752.594444	VERTICAL	0.045	0.357	479453.87	4977934.78	GP04, EU17 IC Engine 1135 hp Cummins (emergency use only)	
ANW_SV12	PM10	262.13	9.14	0.152	56.272	807.594444	VERTICAL	0.0819	0.650	479392.21	4977625.33	GP04, EU18 IC Engine 382 hp Caterpillar (emergency use only)	
ANW_SV13	PM10	262.13	30.48	1.067	0.573	449.816667	VERTICAL	0.0038	0.030	479467.83	4977548.34	GP05, EU19 Raypak Boiler	
ANW_SV14	PM10	262.13	30.48	1.067	0.573	449.816667	VERTICAL	0.0038	0.030	479467.68	4977549.82	GP05, EU20 Raypak Boiler	
ANW_SV15	PM10	262.13	36.3	0.229	0.001	355	VERTICAL	0.0029	0.023	479398.8	4977568.49	GP05, EU21 Lab Boiler	
ANW_SV16	PM10	262.13	36.3	0.229	0.001	355	VERTICAL	0.0029	0.023	479398.81	4977566.61	GP05, EU22 Lab Boiler	
ANW_SV17	PM10	262.13	36.3	0.229	0.001	355	VERTICAL	0.0029	0.023	479398.83	4977564.7	GP05, EU23 Lab Boiler	
ANW_SV18	PM10	262.13	35.97	0.305	2.75178	422.038889	VERTICAL	0.0016	0.013	479398.82	4977559.21	GP05, EU25 Lab Boiler	
ANW_SV19	PM10	262.13	35.97	0.305	2.75178	422.038889	VERTICAL	0.0016	0.013	479398.83	4977557.31	GP05, EU26 Lab Boiler	
ANW_SV20	PM10	262.13	35.97	0.305	2.75178	422.038889	VERTICAL	0.0016	0.013	479398.83	4977557.31	GP05, EU26 Lab Boiler	
ANW_SV21	PM10	262.13	9.14	0.203	52.828	763.705556	VERTICAL	0.0013	0.008	479321.27	4977966.22	GP02, EU08 IC Engine 685 hp Onan (emergency use only)	
ANW_SV22	PM10	262.13	36.3	0.229	0.001	355.372222	VERTICAL	0.0029	0.023	479398.8	4977570.2	GP05, EU28 Lab Boiler	
ANW_SV01	PM2.5	262.13	30.48	1.829	11.083	546.483333	VERTICAL	0.229	1.818	479307.36	4977968.18	GP01, EU01-04 Main Campus Boilers (common stack)	
ANW_SV02	PM2.5	262.13	6.1	0.203	52.391	785.927778	VERTICAL	0.0319	0.253	479346.1	4977959.35	GP02, EU05 IC Engine 685 hp Cummins (emergency use only)	
ANW_SV03	PM2.5	262.13	6.1	0.203	52.391	785.927778	VERTICAL	0.0319	0.253	479347.71	4977959.35	GP02, EU06 IC Engine 685 hp Cummins (emergency use only)	
ANW_SV04	PM2.5	262.13	6.1	0.203	52.828	763.705556	VERTICAL	0.0359	0.285	479357.97	4977959.11	GP02, EU07 IC Engine 685 hp Cummins (emergency use only)	
ANW_SV05	PM2.5	262.13	9.14	0.203	52.828	763.705556	VERTICAL	0.0359	0.285	479321.27	4977966.22	GP02, EU08 IC Engine 685 hp Onan (emergency use only)	
ANW_SV06	PM2.5	262.13	10.67	0.203	56.135	783.15	VERTICAL	0.0479	0.380	479324.85	4977974.6	GP02, EU09 IC Engine 890 hp Onan (emergency use only)	
ANW_SV07	PM2.5	262.13	6.1	0.127	118.847	799.816667	VERTICAL	0.0935	0.742	479343.18	4977754.78	GP02, EU10 IC Engine 355 hp Cummins (emergency use only)	
ANW_SV08	PM2.5	262.13	41.15	0.762	12.4187	544.261111	VERTICAL	0.05	0.397	479456.73	4977937.75	GP03, EU11-14 HH Boilers (common stack)	
ANW_SV09	PM2.5	262.13	10.97	0.279	47.55	752.594444	VERTICAL	0.0436	0.346	479452.65	4977933.37	GP04, EU15 IC Engine 1135 hp Cummins (emergency use only)	
ANW_SV10	PM2.5	262.13	10.97	0.279	47.55	752.594444	VERTICAL	0.0436	0.346	479453.25	4977934.09	GP04, EU16 IC Engine 1135 hp Cummins (emergency use only)	
ANW_SV11	PM2.5	262.13	10.97	0.279	47.55	752.594444	VERTICAL	0.0436	0.346	479453.87	4977934.78	GP04, EU17 IC Engine 1135 hp Cummins (emergency use only)	
ANW_SV12	PM2.5	262.13	9.14	0.152	56.272	807.594444	VERTICAL	0.0819	0.650	479392.21	4977625.33	GP04, EU18 IC Engine 382 hp Caterpillar (emergency use only)	
ANW_SV13	PM2.5	262.13	30.48	1.067	0.573	449.816667	VERTICAL	0.0038	0.030	479467.83	4977548.34	GP05, EU19 Raypak Boiler	
ANW_SV14	PM2.5	262.13	30.48	1.067	0.573	449.816667	VERTICAL	0.0038	0.030	479467.68	4977549.82	GP05, EU20 Raypak Boiler	
ANW_SV15	PM2.5	262.13	36.3	0.229	0.001	355	VERTICAL	0.0029	0.023	479398.8	4977568.49	GP05, EU21 Lab Boiler	
ANW_SV16	PM2.5	262.13	36.3	0.229	0.001	355	VERTICAL	0.0029	0.023	479398.81	4977566.61	GP05, EU22 Lab Boiler	
ANW_SV17	PM2.5	262.13	36.3	0.229	0.001	355	VERTICAL	0.0029	0.023	479398.83	4977564.7	GP05, EU23 Lab Boiler	
ANW_SV18	PM2.5	262.13	36.3	0.229	0.001	355	VERTICAL	0.0029	0.023	479398.82	4977562.8	GP05, EU24 Lab Boiler	
ANW_SV19	PM2.5	262.13	35.97	0.305	2.75178	422.038889	VERTICAL	0.0016	0.013	479398.82	4977559.21	GP05, EU25 Lab Boiler	
ANW_SV20	PM2.5	262.13	35.97	0.305	2.75178	422.038889	VERTICAL	0.0016	0.013	479398.83	4977557.31	GP05, EU26 Lab Boiler	
ANW_SV21	PM2.5	262.13	9.14	0.203	52.828	763.705556	VERTICAL	0.0013	0.008	479321.27	4977966.22	GP02, EU08 IC Engine 685 hp Onan (emergency use only)	
ANW_SV22	PM2.5	262.13	36.3	0.229	0.001	355.372222	VERTICAL	0.0029	0.023	479398.8	4977570.2	GP05, EU28 Lab Boiler	
ANW_SV01	SO2	262.13	30.48	1.829	11.083	546.483333	VERTICAL	0.0314	0.249	479307.36	4977968.18	GP01, EU01-04 Main Campus Boilers (common stack)	
ANW_SV02	SO2	262.13	6.1	0.203	52.391	785.927778	VERTICAL	0.0009	0.007	479346.1	4977959.35	GP02, EU05 IC Engine 685 hp Cummins (emergency use only)	
ANW_SV03	SO2	262.13	6.1	0.203	52.391	785.927778	VERTICAL	0.0009	0.007	479347.71	4977959.35	GP02, EU06 IC Engine 685 hp Cummins (emergency use only)	
ANW_SV04	SO2	262.13	6.1	0.203	52.828	763.705556	VERTICAL	0.001	0.008	479357.97	4977959.11	GP02, EU07 IC Engine 685 hp Cummins (emergency use only)	
ANW_SV05	SO2	262.13	9.14	0.203	52.828	763.705556	VERTICAL	0.001	0.008	479321.27	4977966.22	GP02, EU08 IC Engine 685 hp Onan (emergency use only)	
ANW_SV06	SO2	262.13	10.67	0.203	56.135	783.15	VERTICAL	0.0013	0.010	479324.85	4977974.6	GP02, EU09 IC Engine 890 hp Onan (emergency use only)	

Stack Parameter Input Table

Stack Vent ID	Pollutant	Base Elev [m]	Height [m]	Diam [m]	Exit_Vel [m/s]	Exit_Temp [K]	Release_Type	Emission_Rate (g/sec)	Emission_Rate (lb/hr)	Easting		Northing	
										X1 [m]	Y1 [m]	DESC	
ANW_SV07	SO2	262.13	6.1	0.127	118.847	799.816667	VERTICAL	0.0005	0.004	479343.18	4977754.78	GP02, EU10 IC Engine 355 hp Cummins (emergency use only)	
ANW_SV08	SO2	262.13	41.15	0.762	12.4187	544.261111	VERTICAL	0.00687	0.055	479456.73	4977937.75	GP03, EU11-14 HH Boilers (common stack)	
ANW_SV09	SO2	262.13	10.97	0.279	47.55	752.594444	VERTICAL	0.0012	0.010	479452.65	4977933.37	GP04, EU15 IC Engine 1135 hp Cummins (emergency use only)	
ANW_SV10	SO2	262.13	10.97	0.279	47.55	752.594444	VERTICAL	0.0012	0.010	479453.25	4977934.09	GP04, EU16 IC Engine 1135 hp Cummins (emergency use only)	
ANW_SV11	SO2	262.13	10.97	0.279	47.55	752.594444	VERTICAL	0.0012	0.010	479453.87	4977934.78	GP04, EU17 IC Engine 1135 hp Cummins (emergency use only)	
ANW_SV12	SO2	262.13	9.14	0.152	56.272	807.594444	VERTICAL	0.0004	0.003	479392.21	4977625.33	GP04, EU18 IC Engine 382 hp Caterpillar (emergency use only)	
ANW_SV13	SO2	262.13	30.48	1.067	0.573	449.816667	VERTICAL	0.0003	0.002	479467.83	4977548.34	GP05, EU19 Raypak Boiler	
ANW_SV14	SO2	262.13	30.48	1.067	0.573	449.816667	VERTICAL	0.0003	0.002	479467.68	4977549.82	GP05, EU20 Raypak Boiler	
ANW_SV15	SO2	262.13	36.3	0.229	0.001	355	VERTICAL	0.0002	0.002	479398.8	4977568.49	GP05, EU21 Lab Boiler	
ANW_SV16	SO2	262.13	36.3	0.229	0.001	355	VERTICAL	0.0002	0.002	479398.81	4977566.61	GP05, EU22 Lab Boiler	
ANW_SV17	SO2	262.13	36.3	0.229	0.001	355	VERTICAL	0.0002	0.002	479398.83	4977564.7	GP05, EU23 Lab Boiler	
ANW_SV18	SO2	262.13	36.3	0.229	0.001	355	VERTICAL	0.0002	0.002	479398.82	4977562.8	GP05, EU24 Lab Boiler	
ANW_SV19	SO2	262.13	35.97	0.305	2.75178	422.038889	VERTICAL	0.0001	0.001	479398.82	4977559.21	GP05, EU25 Lab Boiler	
ANW_SV20	SO2	262.13	35.97	0.305	2.75178	422.038889	VERTICAL	0.0001	0.001	479398.83	4977557.31	GP05, EU26 Lab Boiler	
ANW_SV21	SO2	262.13	9.14	0.305	98.907	673.15	VERTICAL	0.0037	0.029	479392.19	4977626.48	EU27 Lab IC Engine (emergency use only)	
ANW_SV22	SO2	262.13	36.3	0.229	0.001	355.372222	VERTICAL	0.0002	0.002	479398.8	4977570.2	GP05, EU28 Lab Boiler	



Minnesota Pollution  
Control Agency  
520 Lafayette Road North  
St. Paul, MN 55155-4194

AQDMPS-01  
Air Quality Dispersion Modeling (AQDM) Protocol Spreadsheet  
Protocol Form for Criteria Pollutant Modeling  
Doc Type: Air Dispersion Modeling

AQ Facility ID No:	05300061
Facility Name:	Abbott
Facility Address:	800 28th St. St. Paul, MN 55102
Facility Contact:	Mr. Timothy B. Grote

Model Input Key

Parameters	Units	Description
ID =		Source ID up to 8 characters
Desc =		Optional description
Base_Elev =	[m]	Source base elevation above mean sea level
Height =	[m]	Release height above ground
Length_X =	[m]	X side length (OPEN PIT, AREA and VOLUME only, optional for VOLUME, will be used to calculate SigmaY)
Length_Y =	[m]	Y side length (OPEN PIT and AREA only)
SigmaZ =	[m]	Initial sigma Z (all AREA and VOLUME only, optional for all AREA)
Emission_Rate =	[g/s or g/s/m2]	Emission rate (g/s for POINT and VOLUME, g/s/m2 for all AREA and OPENPIT)
Num_Coords =		Number of coordinate pairs (POINT = 1, VOLUME = 1, OPENPIT = 1, AREA = 1, AREA_CIRC = 1, AREA_POLY >= 3)
X1 =	[m]	X coordinate of source location [m] Enter here the X coordinate for the vertex of the area source that occurs in the southwest quadrant of the source.
Y1 =	[m]	Y coordinate of source location [m] Enter here the Y coordinate for the vertex of the area source that occurs in the southwest quadrant of the source.

ID	Pollutant	Base_Elev	Height	Length_X	Length_Y	Rotation_Angle	Emission_Rate	Emission_Rate	X1	Y1	X2	Y2	X3	Y3	X4	Y4	Desc
		[m]	[m]	[m]	[m]	[deg]	(lb/hr)	(g/sec)	[m]	[m]	[m]	[m]	[m]	[m]	[m]	[m]	
CONCWE	PM <sub>10</sub>	469.24	0	200	500	0	1	0	483070.73	5247239.03							parking lot
OXPILE	PM <sub>2.5</sub>	469.24	0	50	100	0	0.00000536	0	483070.73	5247239.03							tailings basin

ID	Pollutant	Base_Elev	Height	Length_X	Length_Y	Rotation_Angle	Emission_Rate	Emission_Rate	X1	Y1	X2	Y2	X3	Y3	X4	Y4	Desc
		[m]	[m]	[m]	[m]	[deg]	(lb/hr)	(g/sec)	[m]	[m]	[m]	[m]	[m]	[m]	[m]	[m]	
NONE																	



Minnesota Pollution  
Control Agency  
520 Lafayette Road North  
St. Paul, MN 55155-4194

# AQDMPS-01

Air Quality Dispersion Modeling (AQDM) Protocol Spreadsheet  
Protocol Form for Criteria Pollutant Modeling  
Doc Type: Air Dispersion Modeling

AQ Facility ID No:	053000061
Facility Name:	Abbott
Facility Address:	800 28th Street
Facility Contact:	Mr. Timothy B.

## Model Input Key

Parameters	Units	Description
ID =		Source ID up to 8 characters
Desc =		Optional description
Base_Elev =	[m]	Source base elevation above mean sea level
Height =	[m]	Release height above ground
SigmaY =	[m]	Initial sigma Y (VOLUME only)
SigmaZ =	[m]	Initial sigma Z (all AREA and VOLUME only, optional for all AREA)
Length_X =	[m]	X side length (OPEN PIT, AREA and VOLUME only, optional for VOLUME, will be used to calculate SigmaY)
Emission_Rate =	[g/s or g/s/m2]	Emission rate (g/s for POINT and VOLUME, g/s/m2 for all AREA and OPENPIT)
Num_Coords =		Number of coordinate pairs (POINT = 1, VOLUME = 1, OPENPIT = 1, AREA = 1, AREA_CIRC = 1, AREA_POLY >= 3)
X1 =	[m]	X coordinate of source location [m]
Y1 =	[m]	Y coordinate of source location [m]

ID	Pollutant	Base_Elev [m]	Height [m]	Lateral Dimension		Vertical Dimension		Length_X [m]	Emission_Rate (g/sec)	Emission_Rate (lb/hr)	Easting		Northing
				SigmaY [m]	SigmaZ [m]	SigmaY [m]	SigmaZ [m]				X1 [m]	Y1 [m]	
CONCWE	PM <sub>2.5</sub>	469.24	5	0.2	0.47						483070.73	5247239.03	Desc
SPACEHT	NO <sub>2</sub>	469.24	5	15.2	4.65						483070.73	5247239.03	haul road space heaters

ID	Pollutant	Base_Elev [m]	Height [m]	Lateral Dimension		Vertical Dimension		Length_X [m]	Emission_Rate (g/sec)	Emission_Rate (lb/hr)	Easting		Northing
				SigmaY [m]	SigmaZ [m]	SigmaY [m]	SigmaZ [m]				X1 [m]	Y1 [m]	
NONE													Desc





**Minnesota Pollution  
Control Agency**

520 Lafayette Road North  
St. Paul, MN 55155-4194

# AQDMPS-01

## Air Quality Dispersion Modeling (AQDM) Protocol Spreadsheet Protocol Form for Criteria Pollutant Modeling

Doc Type: Air Dispersion Modeling

AQ Facility ID No:	05300061
Facility Name:	Abbott
Facility Address:	800 28th Street
Facility Contact:	Mr. Timothy B. Grote

Stack Vent ID	Emission Unit	Pollutant	Description	Emission Factor	Emission Factors References/Assumptions/Equations
SV001	EU001	NO <sub>2</sub>	Emergency Power Generator Concentrator - Diesel	0.01	Used to generate short - term emission rate 1,200 kW capacity provided by vendor x 1.341 hp/kW = 1,609 hp lb/hp-hr emission factors from AP-42 'Large Stationary Diesel And All Stationary Dual-fuel Engines'

### Emission Calculations Table

Stack Vent ID	Emission Unit	Pollutant	Description	Emission Factor	Emission Factors References/Assumptions/Equations
SV01	EU01	CO	Boiler 1 - Bros - W2-37 - Main Campus	84.00	AP-42 Section 1.4 (lb/MMSCF)
SV01	EU02	CO	Boiler 2 - Bros - W2-37 - Main Campus	84.00	AP-42 Section 1.4 (lb/MMSCF)
SV01	EU03	CO	Boiler 3 - Bros - W2-37 - Main Campus	84.00	AP-42 Section 1.4 (lb/MMSCF)
SV01	EU04	CO	Boiler 4 - Cleaver Brooks - WT 439X-CN6 - N	84.00	AP-42 Section 1.4 (lb/MMSCF)
SV02	EU05	CO	IC Engine 1 - Cummins - VT-1710-GS - Mair	0.85	AP-42 Section 3.4 (lb/MMBtu)
SV03	EU06	CO	IC Engine 2 - Cummins - VT-1710-GS - Mair	0.85	AP-42 Section 3.4 (lb/MMBtu)
SV04	EU07	CO	IC Engine 3 - Cummins - KTTA 19-G1 - Mair	0.85	AP-42 Section 3.4 (lb/MMBtu)
SV05	EU08	CO	IC Engine 4 - Onan - KTTA 19-G1 - Main Ca	0.85	AP-42 Section 3.4 (lb/MMBtu)
SV06	EU09	CO	IC Engine 5 - Onan - VTA-28 G2 - Main Cam	0.85	AP-42 Section 3.4 (lb/MMBtu)
SV07	EU10	CO	IC Engine 6 - Cummins - NT-855-GS - SKI	0.95	AP-42 Section 3.3 (lb/MMBtu)
SV08	EU11	CO	Boiler 5 - Cleaver Brooks - FLX-900 - Heart H	84.00	AP-42 Section 1.4 (lb/MMSCF)
SV08	EU12	CO	Boiler 6 - Cleaver Brooks - FLX-900 - Heart H	84.00	AP-42 Section 1.4 (lb/MMSCF)
SV08	EU13	CO	Boiler 7 - Cleaver Brooks - FLX-900 - Heart H	84.00	AP-42 Section 1.4 (lb/MMSCF)
SV08	EU14	CO	Boiler 8 - Cleaver Brooks - FLX-900 - Heart H	84.00	AP-42 Section 1.4 (lb/MMSCF)
SV09	EU15	CO	IC Engine 7 - Cummins - QST30-G1 - Heart	0.85	AP-42 Section 3.4 (lb/MMBtu)
SV10	EU16	CO	IC Engine 8 - Cummins - QST30-G1 - Heart	0.85	AP-42 Section 3.4 (lb/MMBtu)
SV11	EU17	CO	IC Engine 9 - Cummins - QST30-G1 - Heart	0.85	AP-42 Section 3.4 (lb/MMBtu)

Stack Vent ID	Emission Unit	Pollutant	Description	Emission Factor	Emission Factors References/Assumptions/Equations Used to generate short - term emission rate
SV12	EU18	CO	IC Engine 10 - Caterpillar - 3306B - Parking	0.95	AP-42 Section 3.3 (lb/MMBtu)
SV13	EU19	CO	Raypak Boiler - Raypac - H34001 - Parking	84.00	AP-42 Section 1.4 (lb/MMSCF)
SV14	EU20	CO	Raypak Boiler - Raypac - H34001 - Parking	84.00	AP-42 Section 1.4 (lb/MMSCF)
SV15	EU21	CO	LAB BOILER #1 - Hydratherm - KN-30 - 10th	84.00	AP-42 Section 1.4 (lb/MMSCF)
SV16	EU22	CO	LAB BOILER #2 - Hydratherm - KN-30 - 10th	84.00	AP-42 Section 1.4 (lb/MMSCF)
SV17	EU23	CO	LAB BOILER #3 - Hydratherm - KN-30 - 10th	84.00	AP-42 Section 1.4 (lb/MMSCF)
SV18	EU24	CO	LAB BOILER #4 - Hydratherm - KN-30 - 10th	84.00	AP-42 Section 1.4 (lb/MMSCF)
SV19	EU25	CO	LAB BOILER #6 - Lattner - WLF - 40 - 10th	84.00	AP-42 Section 1.4 (lb/MMSCF)
SV20	EU26	CO	LAB BOILER #7 - Lattner - WLF - 40 - 10th	84.00	AP-42 Section 1.4 (lb/MMSCF)
SV21	EU27	CO	LAB GEN #1 - Caterpillar - DM8263 - 10th	3.45	Manufacturer (lb/hr)
SV22	EU28	CO	LAB BOILER #5 - Hydratherm - KN-30 - 10th	84.00	AP-42 Section 1.4 (lb/MMSCF)



**Minnesota Pollution  
Control Agency**

520 Lafayette Road North  
St. Paul, MN 55155-4194

# AQDMPS-01

## Air Quality Dispersion Modeling (AQDM) Protocol Spreadsheet Protocol Form for Criteria Pollutant Modeling

Doc Type: Air Dispersion Modeling

AQ Facility ID No:	05300061
Facility Name:	Abbott
Facility Address:	800 28th Street
Facility Contact:	Mr. Timothy B. Grote

Stack Vent ID	Emission Unit	Pollutant	Description	Emission Factor	Emission Factors References/Assumptions/Equations
SV001	EU001	NO <sub>2</sub>	Emergency Power Generator Concentrator - Diesel	0.01	Used to generate short - term emission rate 1,200 kW capacity provided by vendor x 1.341 hp/kW = 1,609 hp lb/hp-hr emission factors from AP-42 'Large Stationary Diesel And All Stationary Dual-fuel Engines'

### Emission Calculations Table

Stack Vent ID	Emission Unit	Pollutant	Description	Emission Factor	Emission Factors References/Assumptions/Equations
SV01	EU01	PM10	Boiler 1 - Bros - W2-37 - Main Campus	2.30	AP-42 Section 1.3 (lb/1000 gal)
SV01	EU02	PM10	Boiler 2 - Bros - W2-37 - Main Campus	2.30	AP-42 Section 1.3 (lb/1000 gal)
SV01	EU03	PM10	Boiler 3 - Bros - W2-37 - Main Campus	2.30	AP-42 Section 1.3 (lb/1000 gal)
SV01	EU04	PM10	Boiler 4 - Cleaver Brooks - WT 439X-CN6 - N	2.30	AP-42 Section 1.3 (lb/1000 gal)
SV02	EU05	PM10	IC Engine 1 - Cummins - VT-1710-GS - Mair	0.0573	AP-42 Table 3.4-2 (lb/MMBtu)
SV03	EU06	PM10	IC Engine 2 - Cummins - VT-1710-GS - Mair	0.0573	AP-42 Table 3.4-2 (lb/MMBtu)
SV04	EU07	PM10	IC Engine 3 - Cummins - KTTA 19-G1 - Mair	0.0573	AP-42 Table 3.4-2 (lb/MMBtu)
SV05	EU08	PM10	IC Engine 4 - Onan - KTTA 19-G1 - Main Ca	0.0573	AP-42 Table 3.4-2 (lb/MMBtu)
SV06	EU09	PM10	IC Engine 5 - Onan - VTA-28 G2 - Main Cam	0.0573	AP-42 Table 3.4-2 (lb/MMBtu)
SV07	EU10	PM10	IC Engine 6 - Cummins - NT-855-GS - SKI	0.31	AP-42 Section 3.3 (lb/MMBtu)
SV08	EU11	PM10	Boiler 5 - Cleaver Brooks - FLX-900 - Heart H	2.30	AP-42 Section 1.3 (lb/1000 gal)
SV08	EU12	PM10	Boiler 6 - Cleaver Brooks - FLX-900 - Heart H	2.30	AP-42 Section 1.3 (lb/1000 gal)
SV08	EU13	PM10	Boiler 7 - Cleaver Brooks - FLX-900 - Heart H	2.30	AP-42 Section 1.3 (lb/1000 gal)
SV08	EU14	PM10	Boiler 8 - Cleaver Brooks - FLX-900 - Heart H	2.30	AP-42 Section 1.3 (lb/1000 gal)
SV09	EU15	PM10	IC Engine 7 - Cummins - QST30-G1 - Heart	0.0573	AP-42 Table 3.4-2 (lb/MMBtu)
SV10	EU16	PM10	IC Engine 8 - Cummins - QST30-G1 - Heart	0.0573	AP-42 Table 3.4-2 (lb/MMBtu)
SV11	EU17	PM10	IC Engine 9 - Cummins - QST30-G1 - Heart	0.0573	AP-42 Table 3.4-2 (lb/MMBtu)

Stack Vent ID	Emission Unit	Pollutant	Description	Emission Factor	Emission Factors References/Assumptions/Equations Used to generate short - term emission rate
SV12	EU18	PM10	IC Engine 10 - Caterpillar - 3306B - Parking 0	0.31	AP-42 Section 3.3 (lb/MMBtu)
SV13	EU19	PM10	Raypak Boiler - Raypac - H34001 - Parking 0	7.60	AP-42 Section 1.4 (lb/MMSCF)
SV14	EU20	PM10	Raypak Boiler - Raypac - H34001 - Parking 0	7.60	AP-42 Section 1.4 (lb/MMSCF)
SV15	EU21	PM10	LAB BOILER #1 - Hydratherm - KN-30 - 10th A	7.60	AP-42 Section 1.4 (lb/MMSCF)
SV16	EU22	PM10	LAB BOILER #2 - Hydratherm - KN-30 - 10th A	7.60	AP-42 Section 1.4 (lb/MMSCF)
SV17	EU23	PM10	LAB BOILER #3 - Hydratherm - KN-30 - 10th A	7.60	AP-42 Section 1.4 (lb/MMSCF)
SV18	EU24	PM10	LAB BOILER #4 - Hydratherm - KN-30 - 10th A	7.60	AP-42 Section 1.4 (lb/MMSCF)
SV19	EU25	PM10	LAB BOILER #6 - Lattner - WLF - 40 - 10th A	7.60	AP-42 Section 1.4 (lb/MMSCF)
SV20	EU26	PM10	LAB BOILER #7 - Lattner - WLF - 40 - 10th A	7.60	AP-42 Section 1.4 (lb/MMSCF)
SV21	EU27	PM10	LAB GEN #1 - Caterpillar - DM8263 - 10th A	0.23	Manufacturer not to exceed (lb/hr)
SV22	EU28	PM10	LAB BOILER #5 - Hydratherm - KN-30 - 10th A	7.60	AP-42 Section 1.4 (lb/MMSCF)



**Minnesota Pollution  
Control Agency**

520 Lafayette Road North  
St. Paul, MN 55155-4194

# AQDMPS-01

## Air Quality Dispersion Modeling (AQDM) Protocol Spreadsheet Protocol Form for Criteria Pollutant Modeling

Doc Type: Air Dispersion Modeling

AQ Facility ID No:	05300061
Facility Name:	Abbott
Facility Address:	800 28th Street
Facility Contact:	Mr. Timothy B. Grote

Stack Vent ID	Emission Unit	Pollutant	Description	Emission Factor	Emission Factors References/Assumptions/Equations
SV001	EU001	NO <sub>2</sub>	Emergency Power Generator Concentrator - Diesel	0.01	Used to generate short - term emission rate 1,200 kW capacity provided by vendor x 1.341 hp/kW = 1,609 hp lb/hp-hr emission factors from AP-42 'Large Stationary Diesel And All Stationary Dual-fuel Engines'

### Emission Calculations Table

Stack Vent ID	Emission Unit	Pollutant	Description	Emission Factor	Emission Factors References/Assumptions/Equations
SV01	EU01	PM2.5	Boiler 1 - Bros - W2-37 - Main Campus	1.55	AP-42 Section 1.3 (lb/1000 gal)
SV01	EU02	PM2.5	Boiler 2 - Bros - W2-37 - Main Campus	1.55	AP-42 Section 1.3 (lb/1000 gal)
SV01	EU03	PM2.5	Boiler 3 - Bros - W2-37 - Main Campus	1.55	AP-42 Section 1.3 (lb/1000 gal)
SV01	EU04	PM2.5	Boiler 4 - Cleaver Brooks - WT 439X-CN6 - Main	1.55	AP-42 Section 1.3 (lb/1000 gal)
SV02	EU05	PM2.5	IC Engine 1 - Cummins - VT-1710-GS - Main	0.0556	AP-42 Table 3.4-2 (lb/MMBtu)
SV03	EU06	PM2.5	IC Engine 2 - Cummins - VT-1710-GS - Main	0.0556	AP-42 Table 3.4-2 (lb/MMBtu)
SV04	EU07	PM2.5	IC Engine 3 - Cummins - KTTA 19-G1 - Main	0.0556	AP-42 Table 3.4-2 (lb/MMBtu)
SV05	EU08	PM2.5	IC Engine 4 - Onan - KTTA 19-G1 - Main	0.0556	AP-42 Table 3.4-2 (lb/MMBtu)
SV06	EU09	PM2.5	IC Engine 5 - Onan - VTA-28 G2 - Main	0.0556	AP-42 Table 3.4-2 (lb/MMBtu)
SV07	EU10	PM2.5	IC Engine 6 - Cummins - NT-855-GS - SKI	0.31	AP-42 Section 3.3 (lb/MMBtu)
SV08	EU11	PM2.5	Boiler 5 - Cleaver Brooks - FLX-900 - Heart	1.55	AP-42 Section 1.3 (lb/1000 gal)
SV08	EU12	PM2.5	Boiler 6 - Cleaver Brooks - FLX-900 - Heart	1.55	AP-42 Section 1.3 (lb/1000 gal)
SV08	EU13	PM2.5	Boiler 7 - Cleaver Brooks - FLX-900 - Heart	1.55	AP-42 Section 1.3 (lb/1000 gal)
SV08	EU14	PM2.5	Boiler 8 - Cleaver Brooks - FLX-900 - Heart	1.55	AP-42 Section 1.3 (lb/1000 gal)
SV09	EU15	PM2.5	IC Engine 7 - Cummins - QST30-G1 - Heart	0.0556	AP-42 Table 3.4-2 (lb/MMBtu)
SV10	EU16	PM2.5	IC Engine 8 - Cummins - QST30-G1 - Heart	0.0556	AP-42 Table 3.4-2 (lb/MMBtu)
SV11	EU17	PM2.5	IC Engine 9 - Cummins - QST30-G1 - Heart	0.0556	AP-42 Table 3.4-2 (lb/MMBtu)

Stack Vent ID	Emission Unit	Pollutant	Description	Emission Factor	Emission Factors References/Assumptions/Equations Used to generate short - term emission rate
SV12	EU18	PM2.5	IC Engine 10 - Caterpillar - 3306B - Parking 0	0.31	AP-42 Section 3.3 (lb/MMBtu)
SV13	EU19	PM2.5	Raypak Boiler - Raypac - H34001 - Parking 0	7.60	AP-42 Section 1.4 (lb/MMSCF)
SV14	EU20	PM2.5	Raypak Boiler - Raypac - H34001 - Parking 0	7.60	AP-42 Section 1.4 (lb/MMSCF)
SV15	EU21	PM2.5	LAB BOILER #1 - Hydratherm - KN-30 - 10th A	7.60	AP-42 Section 1.4 (lb/MMSCF)
SV16	EU22	PM2.5	LAB BOILER #2 - Hydratherm - KN-30 - 10th A	7.60	AP-42 Section 1.4 (lb/MMSCF)
SV17	EU23	PM2.5	LAB BOILER #3 - Hydratherm - KN-30 - 10th A	7.60	AP-42 Section 1.4 (lb/MMSCF)
SV18	EU24	PM2.5	LAB BOILER #4 - Hydratherm - KN-30 - 10th A	7.60	AP-42 Section 1.4 (lb/MMSCF)
SV19	EU25	PM2.5	LAB BOILER #6 - Lattner - WLF - 40 - 10th A	7.60	AP-42 Section 1.4 (lb/MMSCF)
SV20	EU26	PM2.5	LAB BOILER #7 - Lattner - WLF - 40 - 10th A	7.60	AP-42 Section 1.4 (lb/MMSCF)
SV21	EU27	PM2.5	LAB GEN #1 - Caterpillar - DM8263 - 10th A	0.23	Manufacturer not to exceed (lb/hr)
SV22	EU28	PM2.5	LAB BOILER #5 - Hydratherm - KN-30 - 10th A	7.60	AP-42 Section 1.4 (lb/MMSCF)



**Minnesota Pollution  
Control Agency**

520 Lafayette Road North  
St. Paul, MN 55155-4194

# AQDMPS-01

## Air Quality Dispersion Modeling (AQDM) Protocol Spreadsheet Protocol Form for Criteria Pollutant Modeling

Doc Type: Air Dispersion Modeling

AQ Facility ID No:	05300061
Facility Name:	Abbott
Facility Address:	800 28th Street
Facility Contact:	Mr. Timothy B. Grote

Stack Vent ID	Emission Unit	Pollutant	Description	Emission Factor	Emission Factors References/Assumptions/Equations
SV001	EU001	NO <sub>2</sub>	Emergency Power Generator Concentrator - Diesel	0.01	Used to generate short - term emission rate 1,200 kW capacity provided by vendor x 1.341 hp/kW = 1,609 hp lb/hp-hr emission factors from AP-42 'Large Stationary Diesel And All Stationary Dual-fuel Engines'

### Emission Calculations Table

Stack Vent ID	Emission Unit	Pollutant	Description	Emission Factor	Emission Factors References/Assumptions/Equations
SV01	EU01	NO2	Boiler 1 - Bros - W2-37 - Main Campus	20.00	AP-42 Section 1.3 (lb/1000 gal)
SV01	EU02	NO2	Boiler 2 - Bros - W2-37 - Main Campus	20.00	AP-42 Section 1.3 (lb/1000 gal)
SV01	EU03	NO2	Boiler 3 - Bros - W2-37 - Main Campus	20.00	AP-42 Section 1.3 (lb/1000 gal)
SV01	EU04	NO2	Boiler 4 - Cleaver Brooks - WT 439X-CN6 - Main	20.00	AP-42 Section 1.3 (lb/1000 gal)
SV02	EU05	NO2	IC Engine 1 - Cummins - VT-1710-GS - Main	3.2	AP-42 Section 3.4 (lb/MMBtu)
SV03	EU06	NO2	IC Engine 2 - Cummins - VT-1710-GS - Main	3.2	AP-42 Section 3.4 (lb/MMBtu)
SV04	EU07	NO2	IC Engine 3 - Cummins - KTTA 19-G1 - Main	3.2	AP-42 Section 3.4 (lb/MMBtu)
SV05	EU08	NO2	IC Engine 4 - Onan - KTTA 19-G1 - Main	3.2	AP-42 Section 3.4 (lb/MMBtu)
SV06	EU09	NO2	IC Engine 5 - Onan - VTA-28 G2 - Main	3.2	AP-42 Section 3.4 (lb/MMBtu)
SV07	EU10	NO2	IC Engine 6 - Cummins - NT-855-GS - SKI	4.41	AP-42 Section 3.3 (lb/MMBtu)
SV08	EU11	NO2	Boiler 5 - Cleaver Brooks - FLX-900 - Heart	20.00	AP-42 Section 1.3 (lb/1000 gal)
SV08	EU12	NO2	Boiler 6 - Cleaver Brooks - FLX-900 - Heart	20.00	AP-42 Section 1.3 (lb/1000 gal)
SV08	EU13	NO2	Boiler 7 - Cleaver Brooks - FLX-900 - Heart	20.00	AP-42 Section 1.3 (lb/1000 gal)
SV08	EU14	NO2	Boiler 8 - Cleaver Brooks - FLX-900 - Heart	20.00	AP-42 Section 1.3 (lb/1000 gal)
SV09	EU15	NO2	IC Engine 7 - Cummins - QST30-G1 - Heart	3.2	AP-42 Section 3.4 (lb/MMBtu)
SV10	EU16	NO2	IC Engine 8 - Cummins - QST30-G1 - Heart	3.2	AP-42 Section 3.4 (lb/MMBtu)
SV11	EU17	NO2	IC Engine 9 - Cummins - QST30-G1 - Heart	3.2	AP-42 Section 3.4 (lb/MMBtu)

Stack Vent ID	Emission Unit	Pollutant	Description	Emission Factor	Emission Factors References/Assumptions/Equations Used to generate short - term emission rate
SV12	EU18	NO2	IC Engine 10 - Caterpillar - 3306B - Parking 0	4.41	AP-42 Section 3.3 (lb/MMBtu)
SV13	EU19	NO2	Raypak Boiler - Raypac - H34001 - Parking 0	100.00	AP-42 Section 1.4 (lb/MMSCF)
SV14	EU20	NO2	Raypak Boiler - Raypac - H34001 - Parking 0	100.00	AP-42 Section 1.4 (lb/MMSCF)
SV15	EU21	NO2	LAB BOILER #1 - Hydratherm - KN-30 - 10th A	100.00	AP-42 Section 1.4 (lb/MMSCF)
SV16	EU22	NO2	LAB BOILER #2 - Hydratherm - KN-30 - 10th A	100.00	AP-42 Section 1.4 (lb/MMSCF)
SV17	EU23	NO2	LAB BOILER #3 - Hydratherm - KN-30 - 10th A	100.00	AP-42 Section 1.4 (lb/MMSCF)
SV18	EU24	NO2	LAB BOILER #4 - Hydratherm - KN-30 - 10th A	100.00	AP-42 Section 1.4 (lb/MMSCF)
SV19	EU25	NO2	LAB BOILER #6 - Lattner - WLF - 40 - 10th A	100.00	AP-42 Section 1.4 (lb/MMSCF)
SV20	EU26	NO2	LAB BOILER #7 - Lattner - WLF - 40 - 10th A	100.00	AP-42 Section 1.4 (lb/MMSCF)
SV21	EU27	NO2	LAB GEN #1 - Caterpillar - DM8263 - 10th A	42.1	Manufacturer not to exceed (lb/hr)
SV22	EU28	NO2	LAB BOILER #5 - Hydratherm - KN-30 - 10th A	100.00	AP-42 Section 1.4 (lb/MMSCF)





**Minnesota Pollution  
Control Agency**

520 Lafayette Road North  
St. Paul, MN 55155-4194

**AQDMRRF-01**

Air Quality Dispersion Modeling  
Report Review Form (AQDMRRF)  
for Criteria Pollutant Modeling using AERMOD

*Doc Type: Air Dispersion Modeling*

**Acronym Information on Page 6**

**Instructions:** This form is used for Minnesota Pollution Control Agency (MPCA) internal use by Air Dispersion Modeler to review for Criteria Pollutant Modeling.

**Facility Information**

Project title: Abbott Northwestern Hospital Submittal date (mm/dd/yyyy): 04/03/2012  
AQ file no.: 253 AQ facility/permit ID no.: 05300061 AQ tracking number: \_\_\_\_\_  
Three-letter modeling facility ID (ex., XEK = Xcel Energy Allen S. King, MEC = Mankato Energy Center, etc.): ANW  
Facility name: Abbott Northwestern Hospital  
Facility street address: 800 28<sup>th</sup> St East  
City: Minneapolis County: Hennepin  
State: MN Zip code: 55407 Elevation at facility: 262.1 m  
Facility contact: Timothy B Grote Report prepared by: Ryan Birkenholz  
Facility contact phone: 612.863.4164 Preparer phone: 651.697.9737  
Facility contact e-mail: tim.grote@allina.com Preparer e-mail: rbirkenholz@golder.com  
MPCA air modeler: Greg Pratt MPCA air permit engineer: Sarah Sevcik  
Latitude, Longitude of facility (Decimal degrees to **four** decimal places): 44.953177 N, 93.261375 W  
UTM coordinates of facility (NAD83, zone 15 extended **only**): x = 479,383.00 m East, y = 4,977,783.00 m North

**List of Files with Names/Descriptions submitted with Modeling Report**

1. ☒ AERMOD input files (\*.inp, \*.adi, \*.ami)  
☒ AERMOD output files (\*.out, \*.ado, \*.amo)  
☒ AERMOD plot files (\*.plt)  
☐ AERMOD post files (\*.pst) – If applicable  
☐ AERMOD event files (\*.evi, \*.evo) – If applicable  
☐ AERMOD miscellaneous/other files (MAXDCONT, SUMTABLE, etc.) – If applicable
2. ☒ AERMOD meteorological surface files (\*.sfc)  
☒ AERMOD meteorological upper air/profile files (\*.pfl)
3. ☒ BPIP-PRIME input files (\*.bpi, \*.pip)  
☒ BPIP-PRIME output files (\*.bpo, \*.sum)
4. ☒ Terrain file(s) for AERMAP (\*.dem, \*.tif)  
☒ AERMAP input files (\*.ami)  
☒ AERMAP output files (\*.rou, \*.sou, etc.)
5. ☒ Background data files/background concentrations for applicable pollutants (seasonal, monthly, daily, hourly, etc.)
6. ☒ Figures for modeling results (\*.jpeg, \*.bmp, \*.pdf)  
☒ GIS maps for modeling results (\*.shp)

7. ☒ AQDMPS-01 form – if applicable
8. ☒ Other files and supporting documents (SMSv\*.xls, FAR sources, hourly background, hourly ozone, README\*.doc, etc.):

## Section 1. Modeling Review - 30-Day Substantial Completeness Determination

### Review of modeling report by sections

Section and section name	Substantially complete/incomplete	Deficiencies and/or comments
Files to accompany modeling	Substantially Complete	No comments on this section
Section 1: Modeling protocol	Substantially Complete	No comments on this section
Section 2: Changes to modeling protocol	Substantially Complete	No comments on this section
Section 3: Paved roads fugitive dust (optional)	Substantially Complete	No comments on this section
Section 4: Modeling results	Substantially Complete	No comments on this section
Section 5: Discussion	Substantially Complete	No comments on this section
Section 6: Modeling results figures/maps	Substantially Complete	No comments on this section
Modeling report substantially complete?	Substantially Complete	Date (mm/dd/yyyy): 6/18/2012

## Section 2. Modeling Review - 150-Day Approval Determination/Permit Conditions

### Technical review of final modeling report

Review items	Acceptable/ Unacceptable	Deficiencies and/or comments
Are all changes from the protocol adequately described and addressed?	Acceptable	No comments on this section
Are the model files consistent with the MPCA AQDMPS spreadsheet accompanying the permit application?	Acceptable	No comments on this section
Modeling demonstrates compliance with applicable NAAQS/MAAQs and PSD increments?	Acceptable	No comments on this section
Modeling report approved?	Acceptable	Date (mm/dd/yyyy): 6/18/2012
Recommended permit conditions or related items:	The operating schedule for the emergency generators was modeled such that no two were tested simultaneously, and each one was only tested one day per month. This should be reflected in the permit.	

## Section 3. Recommended Permitting Language

### Modeling language tier table

Pollutant	Recommended tier
CO	Tier 1
NO <sub>2</sub>	Tier 3
Pb	Tier 1
PM <sub>2.5</sub>	Tier 3
PM <sub>10</sub>	Tier 1
SO <sub>2</sub>	Tier 1

**Tier language for each modeled pollutant will be based on the lowest growth level for all averaging times.**

% of NAAQS/MAAQS:	> 90%	90% - 75%	< 75%
Allowable Growth Level:	Low	Medium	High
<b>PSD – Limits</b>	Tier 4	Tier 2**	Tier 1
<b>PSD – No Limits</b>	Tier 3	Tier 2**	Tier 1
<b>Not PSD – Limits</b>	Tier 3**	Tier 2**	Tier 1
<b>Not PSD – No Limits</b>	Tier 1	Tier 1	Tier 1

### Acronyms

AERMAP	AERMOD Terrain Preprocessor
AERMOD	AMS/EPA Regulatory Model
AQ	Air Quality
AQDMPS-01	Air Quality Dispersion Modeling Protocol Spreadsheet
BPIP-PRIME	Building Profile Input Program for PRIME
CO	Carbon Monoxide
MAAQS	Minnesota State Ambient Air Quality Standard
MPCA	Minnesota Pollution Control Agency
NAAQS	National Ambient Air Quality Standard
NO <sub>2</sub>	Nitrogen Dioxide
Pb	Lead
PM <sub>10</sub>	Particulate Matter less than 10 um in size
PM <sub>2.5</sub>	Particulate Matter less than 2.5 um in size
PSD	Prevention of Significant Deterioration Program
SO <sub>2</sub>	Sulfur Dioxide

Abbott Northwestern Hospital  
Permit No. 05300061-002  
Technical Support Document

## **Attachment 8**

### **Cumulative Levels and Effects Analysis Report**



# REPORT

## REVISED CUMULATIVE LEVELS AND EFFECTS ANALYSIS

FOR

**Abbott Northwestern Hospital**

**Submitted To:** Abbott Northwestern Hospital  
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**September 2012**

**Project No. 103-81295**



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## EXECUTIVE SUMMARY

This analysis is required by Minnesota Statute § 116.07, Subd 4a and requires that cumulative impacts be considered before the Minnesota Pollution Control Agency can issue a permit. Abbott Northwestern is submitting an air permit application and is located in the geographic area described by the statute. The information presented and discussions in this analysis satisfy the requirements of the statute.

This report, dated September 2012, supersedes the report dated March 2012 and incorporates additional information the MPCA provided.



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## Definitions

Abbott	Abbott Northwestern Hospital
AERA	Air Emission Risk Analysis
Air Dispersion Modeling	Standalone report discussing ambient air quality modeling
Concentration Analysis	
Allina	Allina Health System (parent company that owns Abbott)
Analysis	Cumulative Levels and Effects Analysis
CL&E	Cumulative Levels and Effects
CO	Carbon Monoxide
EPA	United States Environmental Protection Agency
Facility	Abbott Northwestern Hospital and the 10 <sup>th</sup> Avenue Lab Facility
Golder	Golder Associates Inc.
MPCA	Minnesota Pollution Control Agency
MNRS	MPCA Risk Assessment Model
NAAQS	National Ambient Air Quality Standards
NO <sub>2</sub>	Nitrogen Dioxide
NO <sub>x</sub>	Oxides of Nitrogen
Process Document	Process Document for Minnesota Statute 116.07 Subd 4a, version 1.0
Reference Document	Reference Document for Minnesota Statute 116.07 Subd 4a, Sept. 2011
SIL	Significant Impact Level
SIR	Significant Impact Radius
Statute	Minnesota Statute 116.07 Subdivision 4a
Study Area	Defined by the Statute as the outer limit which must be considered in the Analysis
TAC	Toxic Air Contaminant
WIMN	What's in My Neighborhood



## 1.0 INTRODUCTION

Golder Associates Inc. (Golder) performed a cumulative levels and effects analysis (herein referred to as Analysis) to determine the health risks associated with air emissions from the Abbott Northwestern Hospital (Hospital) and the Allina Hospitals and Clinics Labs (Lab) collectively described herein as the Facility. The Facility is owned and operated by Allina Hospitals and Clinics (Allina) and operates under Minnesota Pollution Control Agency (MPCA) air permit 05300061-001. This Analysis is required to comply with Minnesota Statute 116.07 Subdivision 4a (Statute) in connection with the air permit modification. This Analysis is not required by any federal or state regulation other than the Statute.

### 1.1 Facility Description

#### **Background**

Abbott Northwestern Hospital, located in one of the most culturally rich areas of the Twin Cities, is an institution equally rich in its history. Beginning as two separate entities, Northwestern Hospital for Women and Children in the late 1800s and Abbott Hospital for Women in the early 1900s, both hospitals achieved consistent growth and widespread recognition for excellence in care. With a desire to expand medical research and areas of practice, Northwestern and Abbott saw their similar patient demographic, overlap of medical staff, and vision as beneficial reasons to merge. The two entities merged in 1970 to become what's known today as Abbott Northwestern Hospital, the largest hospital in the Twin Cities with a model of care unparalleled in the Upper Midwest. Currently, Abbott Northwestern serves more than 200,000 patients and families each year, delivers more babies than any other hospital in Minnesota—over 4,000 per year, and performs more brain and spine operations than any other Twin Cities hospital. Though the hospital has achieved unmatched volume, the excellence in care is in the quality it delivers. Abbott Northwestern ranks among the top 50 hospitals in the US by *US News & World Report*, is the first hospital in Minnesota to achieve Joint Commission certification for hip and knee replacements, has the first breast center in Minnesota to be accredited by the National Accreditation Program for Breast Centers, and has breast cancer survival rates among the best in the United States. The heart of these achievements that are met and exceeded every day is the people Abbott Northwestern employs—4,800 people with an average of 11.2 years of service. Together with the community, Abbott Northwestern continues to be an institution dedicated to excellence.

#### **Benefitting our Communities**

Each year, Abbott Northwestern Hospital commits substantial resources to community building activities and in response to the health needs of our community. Abbott Northwestern Hospital strives to have a significant and meaningful presence beyond the walls of our institution by partnering with neighborhood groups and working with local non-profits to meet needs and improve health. In 2010, Abbott Northwestern Hospital invested \$62 million in our community; in 2011 the investment was \$68 million.



Examples of ways in which Abbott Northwestern Hospital invests in its community include, but are not limited to: providing access to care for the uninsured; training medical providers; research; partnering with Free Bikes 4 Kidz to distribute bikes to thousands of children; providing gifts to over 100 local families through Adopt-a-family; approximately 75 employees participate each school year in the Everybody Wins reading program at Andersen School; provided grounds maintenance for the CEPRO Site (Midtown Greenway) for the first five years; provide highly subsidized leased space to Freewheel Midtown Bike Center; provide off-season storage for the City of Minneapolis' Nice Ride bikes at no charge; sponsor a Nice Ride kiosk located on Chicago and 27<sup>th</sup>; provide highly subsidized leased space for the YWCA of Minneapolis' Children's Center which provides care for neighborhood children and children whose parents work at the hospital, along with the Child Care Business Development program which trains Somali and Latino women to establish high-quality, licensed childcare businesses; sponsor National Night Out activities; support many other neighborhood activities, projects and organizations, along with health education and support groups for the community.

### **Air Permitting Description**

The Facility consists of the following groups and emission units:

- Group 001 – Four boilers (EU01-EU04) provide steam heating for all Hospital buildings except the Allina Heart Hospital (Heart Hospital). Typically fueled by natural gas, these boilers are equipped to use Number 2 (distillate) fuel oil, primarily as a backup fuel.
- Group 002 – Six internal combustion engine-generators (EU05-EU10) provide backup electrical generation and are fueled by distillate fuel oil. Five of the engines (EU05-EU09) currently participate in the Xcel peak shaving program; however the Hospital will discontinue participation in the Xcel peaking program and will relegate these engine-generators for emergency use only as part of this permit modification. EU10 is classified as an emergency engine-generator and is periodically operated only for maintenance and readiness testing or in the event of an electrical interruption.
- Group 003 – Four boilers (EU11-EU14) provide steam heating for Heart Hospital. Typically fueled by natural gas, boilers are equipped to use distillate fuel oil, primarily as a backup fuel.
- Group 004 – Four internal combustion engine-generators (EU15-EU18) provide backup electrical generation and are fueled by distillate fuel oil. These engines are classified as emergency engine-generators and are periodically operated for maintenance and readiness testing or in the event of an electrical interruption.
- Group 005 – Ten natural gas fired boilers provide building heat and hot water for the 10<sup>th</sup> Avenue parking garage and the Lab. Two boilers (EU19 and EU20) heat the parking garage. These boilers were included in the purchase of the parking garage. The other eight boilers/ water heaters provide steam and hot water to the Lab.
- EU27 – EU27 is classified as an emergency engine-generator and is periodically operated only for maintenance and readiness testing or in the event of an electrical interruption. .



The following processes will also occur, but are either insignificant or do not emit regulated air pollutants:

- VOC emission from above ground storage tanks that contain diesel fuel. Emissions from these sources are insignificant and are not required to be listed on air permit applications in Minnesota if the total capacity is less than 100,000 gallons<sup>1</sup>.
- General health care activities occur at the Hospital and are not required to be listed in an air permit application<sup>2</sup>.
- Laboratory emissions including ventilation from hoods and the use of laboratory chemicals<sup>3</sup>. These emissions are required to be listed on an application but are considered insignificant.

The Analysis considers cumulative health risks due to emissions from air toxics from the Facility. The Analysis follows MPCA guidance<sup>4</sup> in subsequent sections.

## 1.2 Alternatives Considered

The proposed modification involves two changes to the Facility. The first change is switching from number 6 fuel oil to number 2 fuel oil for backup fuel in the GP001 boilers. No other alternatives were considered or are feasible. The fuel switch will result in a permitted reduction of approximately 89 tons per year of sulfur dioxide as well as less significant decreases in the other criteria pollutants and hazardous air pollutants. The Facility is required to have a backup supply of fuel in the event of natural gas curtailment by the utility or an emergency loss of natural gas supply (e.g. pipe rupture). The ability to operate on backup fuel is necessary to protect the patients at the Facility. Other, cleaner burning sources of backup fuel are not feasible for these boilers.

The second change is to incorporate emission units that were installed for the Lab and parking garage at the 10<sup>th</sup> Avenue. The emission units include:

- Ten natural gas fired boilers (EU19-27, EU28); and
- One emergency generator (EU27)

The boilers at the Lab are new, high efficiency hot water and steam boilers that operate on natural gas fuel. The hot water boilers are condensing boilers which can operate at efficiencies up to 99%. Electric heaters were not considered because the electrical demand to heat a building of this size would likely be too great for the utility service that exists. The Lab also has a diesel fueled emergency generator to power life safety systems in the event of a power outage as required by the certificate of occupancy. A natural gas fired generator was not considered because it would be rendered useless during a natural gas curtailment and was not a viable option for this project.

<sup>1</sup> Minnesota Rule 7007.1300 Subp. 2(E)(3)

<sup>2</sup> Minnesota Rule 7007.1300 Subp. 2(I)

<sup>3</sup> Minnesota Rule 7007.1300 Subp. 3(G)

<sup>4</sup> Process Document for Minn. Stat § 116.07, subd. 4a (Cumulative Levels and Effects Process), Version 1.0



Allina chose the 10<sup>th</sup> Avenue location for the Lab for the following reasons:

- Proximity to the Hospital, which requires 24 hours laboratory support
- The building at 10<sup>th</sup> Avenue was vacant
- The Lab will keep an estimated 400 jobs in the Phillips neighborhood



## 2.0 CUMULATIVE LEVELS AND EFFECTS ANALYSIS PROCESS

MPCA guidance suggests the following steps to complete the Analysis:

1. Determine if project is located in an area described by the Statute
2. Submit a modeling protocol to MPCA prior to application
3. Complete Criteria Pollutant Modeling and AERA forms
4. Provide CL&E Scoping Information
5. Submit the CL&E Analysis as part of the complete permit application

Sections 2.1 through 2.5 discuss each step individually and how each step is addressed in this Analysis.

### 2.1 Statute Area

The Statute defines the Statute Area bounded by the following:

***[The Statute Area is defined as] ...a community in a city of the first class in Hennepin County that meets all of the following conditions:***

- (1) is within a half mile of a site designated by the federal government as an EPA superfund site due to residential arsenic contamination;***
- (2) a majority of the population are low-income persons of color and American Indians;***
- (3) a disproportionate percent of the children have childhood lead poisoning, asthma, or other environmentally related health problems;***
- (4) is located in a city that has experienced numerous air quality alert days of dangerous air quality for sensitive populations between February 2007 and February 2008; and***
- (5) is located near the junctions of several heavily trafficked state and county highways and two one-way streets which carry both truck and auto traffic.***

The Statute Area boundary, Figure A1, is described in the MPCA Reference Document<sup>5</sup>. Figure A1 shows that Abbott lies completely within the Statute Area, therefore a cumulative levels and effects analysis (Analysis) is required to be considered before the MPCA can issue the Facility's modified air permit.

### 2.2 Modeling Protocol

The Analysis guidance suggests the use of air dispersion modeling to predict ground level concentrations of pollutants and human health risk. The MPCA reviews and approves the dispersion modeling protocol before dispersion modeling is completed. A protocol was approved by the MPCA on December 19, 2011. The protocol and review forms are located in an attachment to the Air Dispersion Modeling Concentration Analysis.

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<sup>5</sup> Reference Document for Minnesota Statute § 116.07, Subdivision 4a, Version 1.1, September 2011



### 2.3 Criteria Pollutant Modeling/Air Toxics Modeling AERA Forms

The Analysis requires criteria pollutant modeling and air toxics modeling as well as the completion of the MPCA AERA forms. Although both criteria modeling and air toxics modeling use the same dispersion model, the standards for each process have different purposes. The criteria pollutant concentrations must meet the National Ambient Air Quality Standards (NAAQS), which are set by the U.S. EPA. Compliance with the NAAQS is required by any facility that has an air permit; however typically a compliance demonstration using a dispersion model is not required for non-Title V permits in Minnesota (such as this Facility). Air toxics modeling is conducted to estimate the human risk associated with the air toxics emissions. The estimated risks are calculated based on state guidelines for inhalation toxicity values. There are no federal standards, state air toxics rules, or any other requirements that apply to this situation to conduct such a study. The criteria pollutant and air toxics analyses have been separated in this text since the purposes and related regulatory requirements of the two analyses differ. The differences can be explained partially by the table below.

TABLE 2.3 : DIFFERENCES BETWEEN CRITERIA POLLUTANT AND AIR TOXICS REQUIREMENTS	
Criteria pollutants	Air toxics
<ul style="list-style-type: none"><li>• Have national and/or state standards</li></ul>	<ul style="list-style-type: none"><li>• Have state guidelines</li></ul>
<ul style="list-style-type: none"><li>• Enforceable</li></ul>	<ul style="list-style-type: none"><li>• Less enforceable</li></ul>
<ul style="list-style-type: none"><li>• More confidence in health numbers/more data</li></ul>	<ul style="list-style-type: none"><li>• Less confidence in health numbers/less data</li></ul>
<ul style="list-style-type: none"><li>• Include PM<sub>2.5</sub>, NO<sub>2</sub>, PM<sub>10</sub>, SO<sub>2</sub>, CO, O<sub>3</sub>, lead</li></ul>	<ul style="list-style-type: none"><li>• Includes non-criteria pollutants</li></ul>

The criteria pollutant modeling analysis is submitted as a separate report. The criteria pollutant modeling analysis shows that the Facility does not cause or contribute to an exceedance of the NAAQS and therefore is protective of human health and welfare. A summary of these modeled concentrations is discussed in Section 3.1.

The air toxics analysis follows the AERA process established by the MPCA. The AERA process is typically only required for a facility that emits greater than 250 tpy of criteria pollutants and some other specific categories such as coal fired power plants.

The AERA process involves completing a series of MPCA forms. These forms are included in Appendix B. A more detailed discussion of the AERA analysis is in Section 3.2.

### 2.4 CL&E Scoping

The size of the Study Area considered in the Analysis is defined by the air modeling results. The Study Area is the larger of the following areas:





- The area where a criteria pollutant ( $\text{NO}_2$ ,  $\text{SO}_2$ , CO, PM10, or PM2.5) concentration exceeds the significant impact level (SIL) or
- The area where the human health risk exceeds 10% of the screening level ( i.e., 0.1 for hazard indices and 0.1 per 100,000 for cancer risk)

The Study Area for this Analysis is defined by the extent of the  $\text{NO}_2$  SIL as represented by the average of the annual 98<sup>th</sup> percentile values of the daily maximum 1-hr average. The Study Area extends approximately 3,100 meters from the Facility.

## 2.5 CL&E Analysis

The Analysis submitted with the air permit application and discusses the effects of air emissions from the Facility within the Study Area. The following sections discuss both qualitative and quantitative aspects of the AERA and CL&E Analysis.

## 2.6 Public Outreach

The CL&E process requires that the Facility conduct public outreach with the surrounding community. Allina proposes to conduct the following activities to communicate this proposed change to the public:

- Conduct formal presentations to the various neighborhood groups in the Philips neighborhood, such as Midtown Philips Neighborhood Association, Philips West, and others
- Conduct formal presentations to other neighborhood groups such as the Lake Street Council, Midtown Business Association, and others
- Meet with city, county and state officials who represent the Philips neighborhood
- Conduct open meetings/tours at Abbott Northwestern Hospital if need is identified as a result of the aforementioned activities



### 3.0 QUANTITATIVE ANALYSIS

#### 3.1 Criteria Pollutant Modeling Summary

The following criteria pollutants and averaging times are analyzed:

- Carbon Monoxide, CO (1-hr and 8-hr)
- Nitrogen Dioxide, NO<sub>2</sub> (1-hr, and annual)
- Particulate Matter less than 10 microns, PM<sub>10</sub> (24-hr)
- Particulate Matter less than 2.5 microns, PM<sub>2.5</sub> (24-hr and annual)
- Sulfur Dioxide (1-hr, 3-hr, 24-hr, and annual)
- Lead (monthly)

The first step of the NAAQS analysis is to determine the significant impact radius for each pollutant and averaging time. The results from the significant impact analysis are presented in Table 3.1.

TABLE 3.1 - SIGNIFICANT IMPACT RADIUS				
Pollutant	Averaging Time	Maximum Impact (µg/m <sup>3</sup> )	Significant Impact Radius (meters)	Significant Impact Level (µg/m <sup>3</sup> )
NO <sub>2</sub>	Annual	9.5	700	1.0
NO <sub>2</sub>	1-hr	373.1	6000	7.55
PM <sub>10</sub>	Annual	0.9	N/A	1.0
PM <sub>10</sub>	24-hr	4.3	N/A	5.0
PM <sub>2.5</sub>	Annual	0.9	400	0.3
PM <sub>2.5</sub>	24-hr	3.3	600	1.2
CO	8-hr	76.2	N/A	500
CO	1-hr	241.4	N/A	2000
SO <sub>2</sub>	Annual	0.1	N/A	1.0
SO <sub>2</sub>	24-hr	0.3	N/A	5.0
SO <sub>2</sub>	3-hr	0.7	N/A	25
SO <sub>2</sub>	1-hr	1.5	N/A	7.80

Table 3.1 indicates a significant impact radius of 6,000 meters. The significant impact area will be referred to as the Study Area throughout the remainder of this analysis. This distance is based on the high first high impact rather than the design value impact. Through discussions with the MPCA, the design value is a better way to define the Study Area. The design value exceeds the SIL out to a distance of 3,100 meters. Only pollutants that have concentrations that exceed the significant impact level are required to undergo refined dispersion modeling. NO<sub>2</sub> and PM<sub>2.5</sub> are further refined in this Analysis. See the Air Dispersion Modeling Concentration Analysis for details on NAAQS modeling.



### 3.2 AERA Summary

The AERA analysis use air modeling results and air toxic emissions to determine the human health risks from inhalation and ingestion. The four primary classifications to describe human health risk are:

- Acute Inhalation – Based on the maximum 1-hr impact
- Subchronic Noncancer – Based on the maximum monthly impact
- Chronic Noncancer – Based on the average impact over the entire period (annual)
- Cancer – Based on the average impact over the entire period (annual)

Although lead and NO<sub>2</sub> concentrations are included in the NAAQS analysis in Section 3.1, they are also included in the AERA analysis.

Each of the risks from the dispersion modeling and AERA analysis are quantified in Table 3.2.

TABLE 3.2A - Health Risks from AERA				
Risk Classification	Modeled Risk Using Q/CHI	Risk Guideline	Less Than 10% of Risk Guideline?	Meet Risk Guideline?
<b>Inhalation Risks</b>				
Acute	0.589	1	NO	YES
Subchronic	0.001	1	YES	YES
Chronic	0.016	1	YES	YES
Cancer	5.6E-07	1E-05	YES	YES
<b>Indirect Risks</b>				
Urban Gardener, Chronic	0.018	1	YES	YES
Urban Gardener, Cancer	4.1E-07	1E-05	YES	YES
Resident, Chronic	0.002	1	YES	YES
Resident, Cancer	1.0E-07	1E-05	YES	YES
<b>Total Multipathway Risks</b>				
Urban Gardener, Chronic	0.018	1	YES	YES
Urban Gardener, Cancer	9.6E-07	1E-05	YES	YES
Resident, Chronic	0.017	1	YES	YES
Resident, Cancer	6.6E-07	1E-05	YES	YES

**NOTES:**

Farmer risks were not quantified because there are no farming receptors that meet the exposure requirements within the farmer scenario. The farmer exposure criteria are listed in Table 3.2b.



TABLE 3.2B - Farmer Exposure Criteria		
Exposure	Exposure Criteria (lb/week)	
	Adult	Child
Exposed Vegetables*	0.5	0.3
Root Vegetables*	0.2	0.1
Protected Vegetables*	0.7	0.4
Beef Consumption	1.3	0.2
Pork Consumption	0.6	0.1
Poultry Consumption	0.7	0.1
Egg Consumption	7 eggs/week	1 egg/week
Dairy Consumption	0.03 pints/week	5 pints/week
Indirect Soil Ingestion*	0.7 grams/week	1.4 grams/week
Body Weight	70 kg	15 kg
Farmers are assumed to consume all products		
Residents are assumed to only consume products designated with a "*"		

Cancer, chronic and subchronic risks are below 10% of the risk guidelines which is a low enough impact to justify no further discussion in this Analysis. The acute risk exceeds 10% of the risk guidelines and is discussed further in this Analysis. Exceeding 10% of the risk guidelines does not indicate a potential increase in health effects; its only purpose is to potentially define the Study Area.

Concentrations were also modeled at elevated receptors. The elevated receptors are designed to represent exposure locations for residents that live in tall buildings and public locations that are significantly elevated from ground level such as the top decks of the nearby parking garages. The risks from elevated receptors are quantified for the acute and chronic non-cancer exposure scenarios. The acute model predicts a maximum total risk of 0.86 at elevated receptors (greater than the maximum ground level receptor). The chronic non cancer model predicts a maximum total risk of 0.011 at elevated receptors (lower than the maximum ground level concentration). An analysis was not conducted for subchronic risks at elevated receptors because the predicted risk is a small fraction of the screening guideline. An analysis was not conducted for cancer risk at elevated receptors because cancer exposure is based on a 70 year exposure period. A 70 year exposure period is not reasonable at elevated receptors such as the top deck of a parking garage.

The acute risk is discussed in greater detail in Section 3.3.

### 3.3 Acute Risk

Table 3.2 lists the maximum acute risk hazard index as 0.589. This represents the single highest hour of impact in a 5 year data set while assuming that all of the emission units are in operation with the exception of the emergency generators. Emergency generators are excluded from the AERA as per MPCA guidance<sup>6</sup>. Greater than 95% of the acute risk is from NO<sub>2</sub>. If NO<sub>2</sub> were not considered in the

<sup>6</sup> Air Emission Risk Analysis Guidance, Version 1.1, September 2007, Section 3.3.2.



acute risk, the hazard index would be below 10% of the threshold and no further analysis would be required. In addition, NO<sub>2</sub> modeled concentrations show compliance with the NAAQS and are therefore protective of human health.

Because the total acute risk hazard index is less than 1.0, the acute impacts from this Facility are protective of human health. Additionally, the Facility meets the federal 1-hr NO<sub>2</sub> NAAQS, which suggests that the emission of NO<sub>2</sub> is protective of human health. See the Air Dispersion Modeling Concentration Analysis for details on NAAQS modeling.

### **3.4 Quantitative Discussion on Facility Contribution to Background**

Section 3.1 states that the modeled impacts from NO<sub>2</sub> and PM<sub>2.5</sub> exceed the screening levels identified in the Process Document.

NAAQS are established by the EPA to protect human health (primary standards) and the environment (secondary standards). The results from the analysis are presented in Table 3.4A.



TABLE 3.4A - MODELED CONCENTRATIONS

Pollutant	Averaging Time	Maximum concentration including background ( $\mu\text{g}/\text{m}^3$ )	NAAQS ( $\mu\text{g}/\text{m}^3$ )	MAAQS ( $\mu\text{g}/\text{m}^3$ )
NO <sub>2</sub>	Annual	48.8	100	100
NO <sub>2</sub>	1-hr (design value)	178.7 (A)	188	N/A
PM10	Annual	<SIL	50	50
PM10	24-hr H1H	<SIL	150	150
PM2.5	Annual	13.0	15	15
PM2.5	24-hr (design value)	34.0	35	65
CO	8-hr H1H	<SIL	10,000	10,000
CO	1-hr H1H	<SIL	40,000	35,000
SO <sub>2</sub>	Annual	<SIL	80	60
SO <sub>2</sub>	24-hr H1H	<SIL	365	365
SO <sub>2</sub>	3-hr H1H	<SIL	1300	915
SO <sub>2</sub>	1-hr H1H	<SIL	196	1300
(A) The model shows a maximum concentration of 442 $\mu\text{g}/\text{m}^3$ ; however the maximum concentration near the Facility is 178.7 $\mu\text{g}/\text{m}^3$ along the east side of the Lab building. Background facilities are responsible for the maximum concentration. See modeling report for details.				
Annual concentrations represent 5 year average concentrations.				
H1H = Highest first high. Design value = form of standard established by EPA.				
24-hr PM2.5 represents the 5-yr average of the 98th percentile of daily impacts				
<SIL indicates that the maximum modeled concentration from the Hospital is less than that respective significant impact level, which means that the Hospital will not significantly contribute for that pollutant and averaging time and therefore refined modeling is not required.				
NAAQS = National Ambient Air Quality Standard				
MAAQS = Minnesota Ambient Air Quality Standard				

Results from the NAAQS analysis show that the Facility does not cause or contribute to a violation of the NAAQS and is therefore protective of human health. See the Air Dispersion Modeling Concentration Analysis for more details.

The MPCA operates a PM2.5 ambient air monitor on the roof of the Hans Christian Anderson School adjacent to the Hospital. The ambient monitoring data from 2001 through 2010 from this monitor is presented in Table 3.4B and graphically in Figures 3.4A & B and no monitored violations of the NAAQS are observed.



TABLE 3.4B - MEASURED PM <sub>2.5</sub> AMBIENT AIR CONCENTRATIONS IN THE PHILLIPS COMMUNITIES, AIR MONITOR #963		
	3-year-average of annual 98th %tile values (rounded to nearest 1 µg/m <sup>3</sup> )	3-year-average of annual wtd arith mean (rounded to nearest 0.1 µg/m <sup>3</sup> )
	Minneapolis-Phillips	Minneapolis-Phillips
Averaging Time	Daily - 24 hours	Annual
MPCA Site ID	963	963
EPA Site ID	270530953	270530953
2001-2003	28	10.7
2002-2004	27	9.8
2003-2005	28	9.8
2004-2005	26	9.3
2005-2007	24	9.7
2005-2008	23	9.5
2007-2009	29	10
2008-2010	31	9.7
2009-2011*	30	
comparison standard	35	15

Data in this table provided by the MPCA. \* indicates incomplete data.

Figure 3.4A - Graphical Presentation of Data in Table 3.4B (Annual)

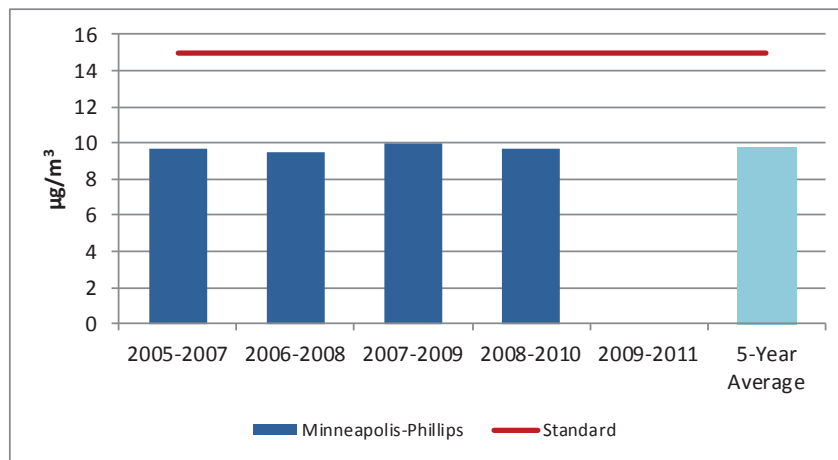
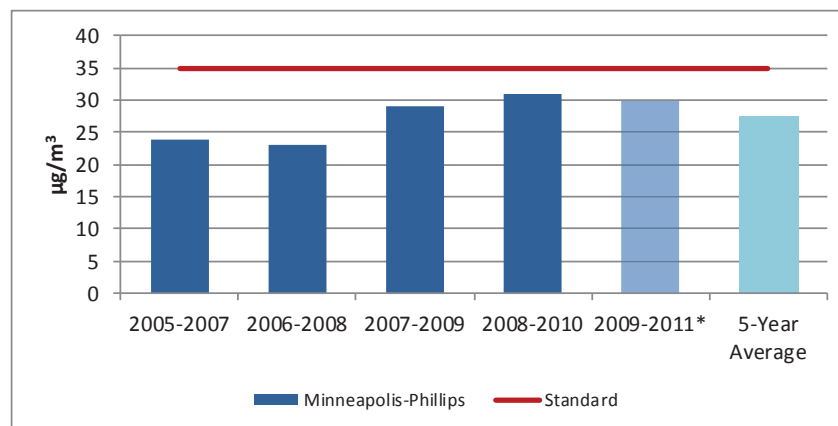


Figure 3.4B - Graphical Presentation of Data in Table 3.4B (Daily)





The nearest NO<sub>2</sub> monitor is more than 20 km from the Hospital and discussion of the Hospital's impact on that monitor is not meaningful because it is outside the significant impact radius of the Hospital.

Figures 3.4C and 3.4D show PM<sub>2.5</sub> monitoring data from other monitors throughout the state. The concentrations recorded at the Phillips neighborhood monitor are consistent with values recorded at other monitors throughout the state.

FIGURE 3.4C - Graphical Presentation of PM<sub>2.5</sub> Monitor Data (24-hr Average) from Multiple Monitors

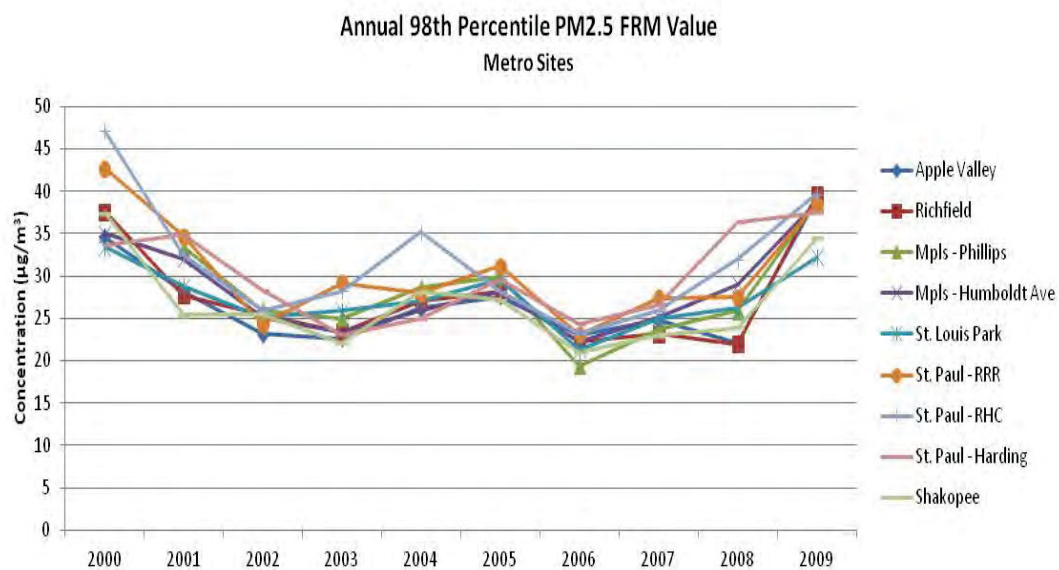
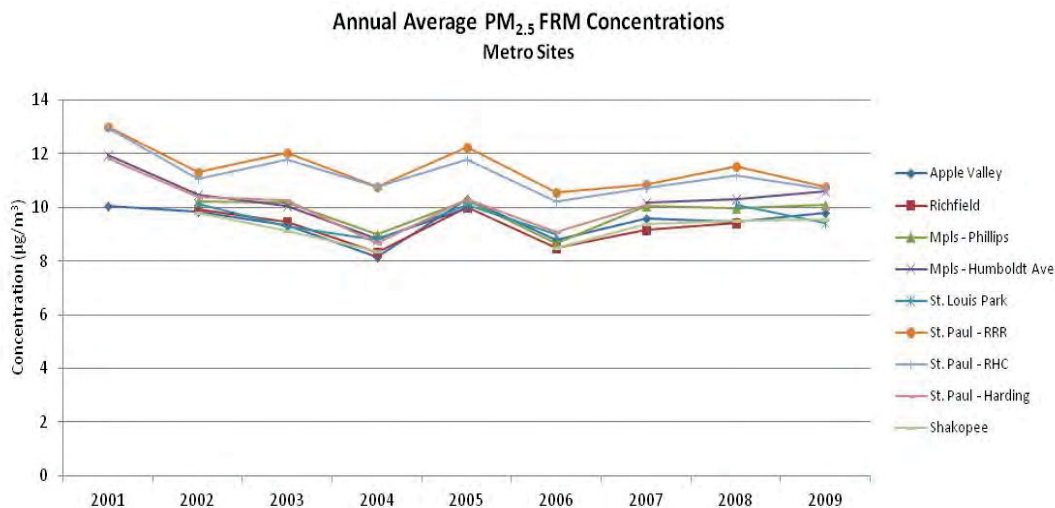
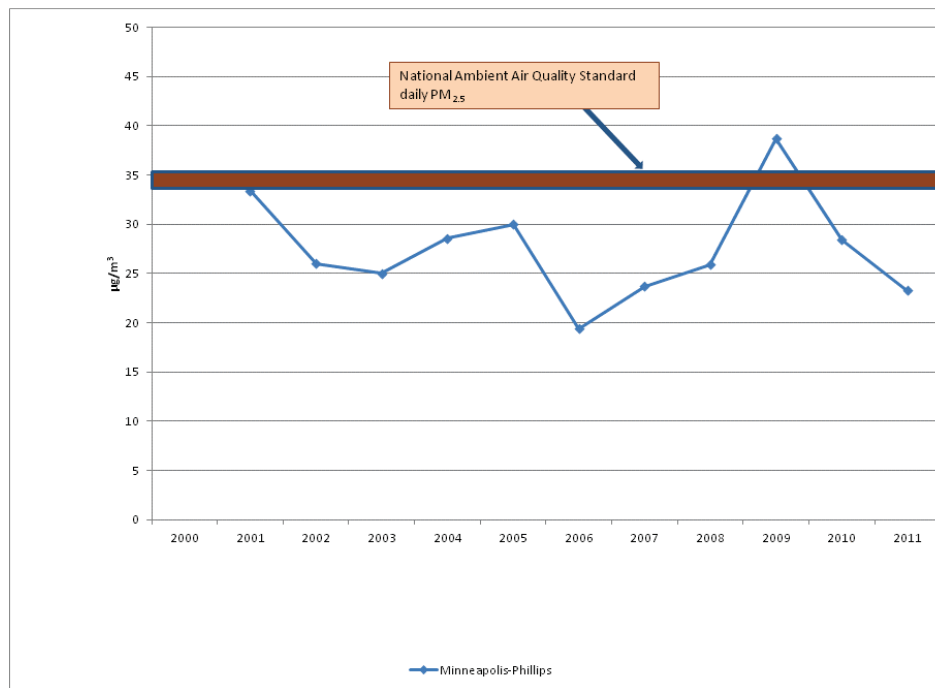
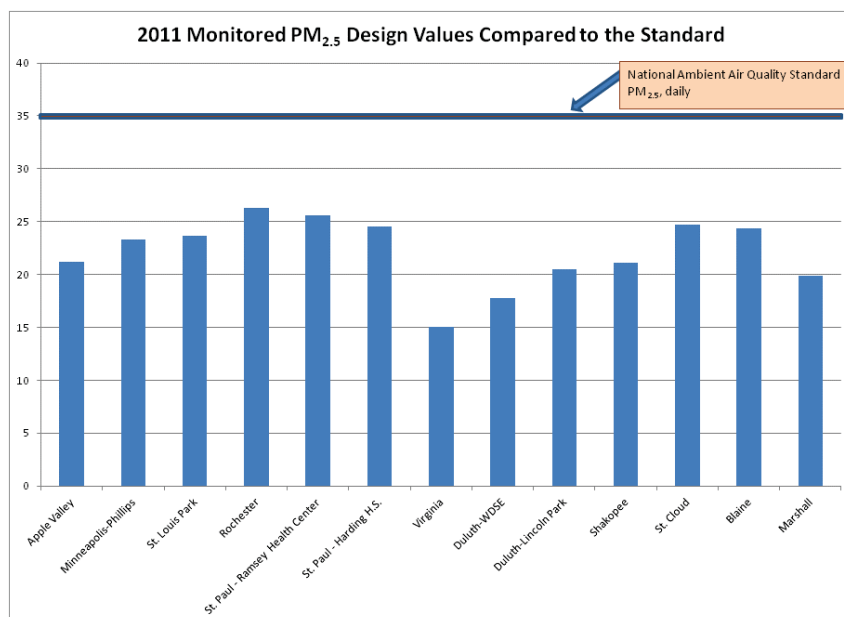


FIGURE 3.4D - Graphical Presentation of PM<sub>2.5</sub> Monitor Data (Annual Average) from Multiple Monitors



Data in Figures 3.4C and 3.4D are provided by the MPCA



FIGURE 3.4E – PM<sub>2.5</sub> Monitor Data (2001 – 2011)FIGURE 3.4F – PM<sub>2.5</sub> Monitor Data (2011)



The Air Quality Index (AQI) was developed to communicate general air quality to the public. Figures 3.4E and 3.4F present information for Air Quality alert days from 2010 and 2011, respectively, as calculated by  $PM_{2.5}$  measurements throughout Minnesota. The methods for measuring, and the equations for calculating, air quality alert days have changed, and therefore comparisons of air quality alert days over time are complicated. In Minnesota, the AQI is calculated from measurements of ground-level ozone, sulfur dioxide, carbon monoxide and fine particles ( $PM_{2.5}$ ). The final AQI is taken from the highest of those measurements. The two pollutants of concern for Minnesota are generally  $PM_{2.5}$  and ozone, with AQI days based on ozone only occurring occasionally in the summer months. Minnesota's Air Quality Index is generally based  $PM_{2.5}$  concentrations (i.e.  $PM_{2.5}$  concentrations result in the highest Air Quality Index value). Figures 3.4G and 3.4H are provided by the MPCA to show how the AQI varies throughout the state of Minnesota in 2010 and 2011.

FIGURE 3.4G – Air Quality Index (2010)

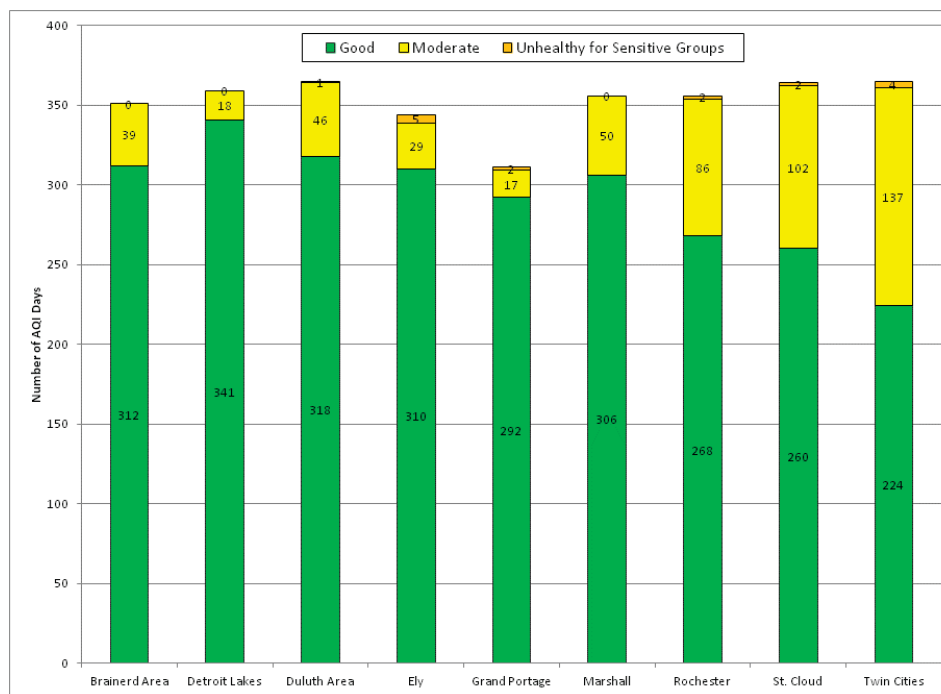
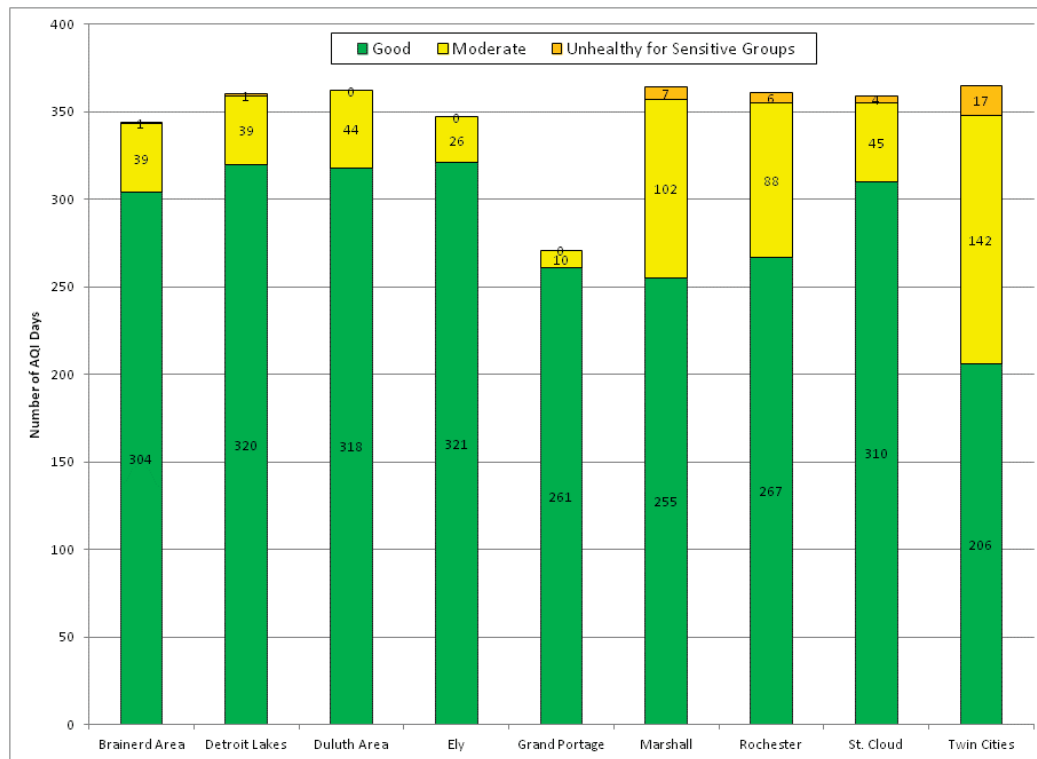




FIGURE 3.4H – Air Quality Index (2011)





## 4.0 QUALITATIVE ANALYSIS

The qualitative information from the AERA analysis is presented on the MPCA AERA forms (See Appendix B) and is not discussed further in this report. The qualitative analysis relating to the CL&E Analysis is presented in the following sections.

### 4.1 Human Health Endpoints

The Study Area was determined using the results from the NAAQS modeling for NO<sub>2</sub> and PM<sub>2.5</sub> and the acute risk model from the AERA. These pollutants determined the scoping of human health endpoints.

Because NO<sub>2</sub> accounts for greater than 95% of the estimated acute risk, the qualitative analysis will focus on short term NO<sub>2</sub> exposure. The health endpoints associated with short term exposures to the pollutants listed above include:

- Acute respiratory/olfactory (1-hr basis, nitrogen dioxide, 24-hr PM<sub>2.5</sub>)
- Short term cardiovascular (24-hr basis, PM<sub>2.5</sub>)

Respiratory/olfactory effects are associated with acute exposures to some air pollutants and can include respiratory/olfactory illnesses, decrements in lung function, exacerbation of asthma, etc. Cardiovascular effects are associated with short-term exposure of PM<sub>2.5</sub> and can include ischemic heart disease. Ischemic heart disease is characterized by ischemia (reduced blood flow to the heart).

The MPCA confirmed on December 22, 2011 that the Reference Document represents the most current compilation of the best available information for the Statute Area and that additional analysis is not required.

### 4.2 Persistent, Bioaccumulative and Toxic Compounds

The following compounds are considered to be “persistent, bioaccumulative, and toxic” (PBT compounds), and may be emitted from the combustion of fuel oil and natural gas at the Facility:

- Acenaphthene
- Anthracene
- Arsenic
- Benzo[a]anthracene
- Benzo[k]fluoranthene
- Benzo[a]pyrene
- Benzo[b]fluoranthene
- Chrysene
- Bibenz[a,h]anthracene



- Dimethylbenz[a]anthracene,7,12
- Fluoranthene
- Fluorene
- Indeno(1,2,3-cd)pyrene
- Lead
- Mercury
- 3-Methylchloranthene
- 2-Methylnapthalene
- Octachlorodibenzo-p-dioxin, 1,2,3,4,6,7,8,9
- Pyrene

Emissions of PBT compounds occur any time natural gas or fuel oil is combusted, including residential furnaces.

The Process Document requires PBT compounds to be discussed with the MCPA. Based on Table 4.2, PBT compounds account for less than half the total risk for all the inhalation risks except for subchronic. The total subchronic risk is less than 2% of the level that the MPCA considers protective of human health. Although PBT compounds account for greater than half the subchronic risk, this is not a significant human health risk. PBT compounds are not discussed further in this analysis because the project does not exceed the screening criteria for subchronic, chronic noncancer or cancer risks.

TABLE 4.2 - PBT Compound Risks	
Risk Type	Contribution of PBT Compounds to Total Risk
Acute	2.7%
Subchronic	67.1%
Chronic	21.6%
Cancer	42.2%

PBT = Persistent Bioaccumulative and Toxic

NOTE: Listed risks are below the facility risk guideline of 1.

### 4.3 Qualitative Discussion on Facility Contribution to Background Levels

#### Facility Specific Acute Hazard Index

The maximum acute hazard index for the Abbot Northwestern Hospital AERA modeling is predicted to be 0.6 (compared to a facility risk guideline of 1). This is the sum of the ratios of each air pollutant concentration with the corresponding acute health benchmark. If a pollutant does not have an acute



health benchmark, then that pollutant is not included in the summation. The majority (>95%) of the hazard index estimate comes from a modeled nitrogen dioxide (NO<sub>2</sub>) concentration. Exposure to NO<sub>2</sub> at concentrations above the health benchmark (or toxicity value) is associated with acute respiratory events or irritation. Short-term NO<sub>2</sub> concentrations are the only pollutant to screen in for further study from the air toxics modeling efforts. For this reason, the following cumulative comparison is limited to the acute respiratory human health endpoint.

#### Acute Respiratory Hazard Index from Ambient Monitoring Data

In addition to the facility specific modeling, ambient air monitoring data can be used to estimate existing background risks. One must keep in mind that portions of the facility already exist, and so some of this monitoring data may reflect the existing facility emissions. The maximum acute respiratory hazard index using a summation of air concentrations measured at the Phillips monitor on the H.C. Andersen School and the maximum NO<sub>2</sub> measurement in the state for the most recent 3 years is 0.4. The sum of the specific modeled air concentrations from the facility and the existing background measurement is 1. The EPA definition for an aggregate hazard index of 1 or less describes this value as *“likely will not result in adverse noncancer health effects over a lifetime of exposure and would ordinarily be considered acceptable”*. An acute respiratory hazard index has a similar interpretation, but relates to hourly or short term exposures. The full definition and description of these calculations from the EPA perspective is included below<sup>7</sup>. Generally, the facility risk guideline of 1, is used by the MPCA for comparisons with facility specific emissions. There is not a “cumulative risk guideline”, and so we have compared this summation value described above to a guideline used for facility specific risk estimates.

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<sup>7</sup> **EPA National Air Toxics Assessment Glossary and Methodology for calculating an aggregate Hazard index (HI):** The sum of hazard quotients (HQs) for substances that affect the same target organ or organ system. Because different pollutants can cause similar adverse health effects, it is often appropriate to combine HQs associated with different substances. EPA has drafted revisions to the national guidelines on mixtures that support combining the effects of different substances in specific and limited ways. Ideally, HQs should be combined for pollutants that cause adverse effects by the same toxic mechanism. However, because detailed information on toxic mechanisms was not available for most of the substances in this assessment, EPA aggregates the effects when they affect the same target organ regardless of the mechanism. The hazard index (HI) is only an approximation of the aggregate effect on the target organ, (i.e., lungs) because some of the substances might cause irritation by different, (i.e., non-additive,) mechanisms. As with the HQ, aggregate exposures equal to or below an HI of 1.0 derived using target organ specific hazard quotients likely will not result in adverse noncancer health effects over a lifetime of exposure and would ordinarily be considered acceptable. However, an HI greater than 1.0 does not necessarily suggest a likelihood of adverse effects. Because of the inherent conservatism of the reference concentration (RfC) methodology, the acceptability of exceedances must be evaluated on a case-by-case basis, considering such factors as the confidence level of the assessment, the uncertainties, the slope of the dose-response curve (if known), the magnitude of the exceedance, and the numbers or types of people exposed at various levels above the RfC. Furthermore, the HI cannot be translated to a probability that adverse effects will occur and is not likely to be proportional to risk.



Aggregate exposures below a HI of 1.0 will likely not result in adverse noncancer health effects over a lifetime of exposure. However, an HI greater than 1.0 does not necessarily suggest a likelihood of adverse effects. Furthermore, the HI cannot be translated to a probability that adverse effects will occur, and is not likely to be proportional to risk. A respiratory HI greater than 1.0 can be best described as indicating that a potential may exist for adverse irritation to the respiratory system.

An elevated acute hazard index can affect the olfactory/respiratory health endpoint and contribute to asthma episodes. The olfactory/respiratory health endpoint and asthma are further discussed in Section 4.3.6.4.

Emissions from motor vehicles are more likely to have a greater contribution to the nitrogen dioxide concentrations than point sources such as those at the Facility. Because the Study Area is near several heavily traveled roads, including Interstate 35W, Lake Street, and Chicago Avenue, acute risk from nitrogen dioxide is expected to be elevated when compared to a location in a rural area.

The changes proposed to the Facility will not significantly affect traffic density in the area. The switching of fuel in GP001 boilers will not affect traffic density because it is not creating significant number of new jobs. The expansion of the laboratory will employ approximately 400 people, however the vast majority of those jobs already existed in labs at the Hospital and are simply being relocated to the new location. Therefore, there is a net increase of approximately 19 jobs due to the proposed changes. Assuming that all of the new jobs will commute to work in their own vehicles, this will result in an increase of no more than 19 vehicles per day. Table 4.3 and Figure 4.3 show measured traffic densities near the study area in 2005.

Minneapolis City ordinance (Title 3 Article 1) specifies that vehicles may not idle for more than 5 minutes in any 60 minute period except for a 30 minute period if the vehicle is waiting to load or unload. There are some instances when vehicles are exempt from this ordinance such as during cold weather to operate heaters to prevent a safety or health emergency. The Facility accepts numerous deliveries by truck and is subject to this ordinance. It is unlikely that delivery trucks would exceed times specified in this ordinance; however in certain weather situations it is possible.



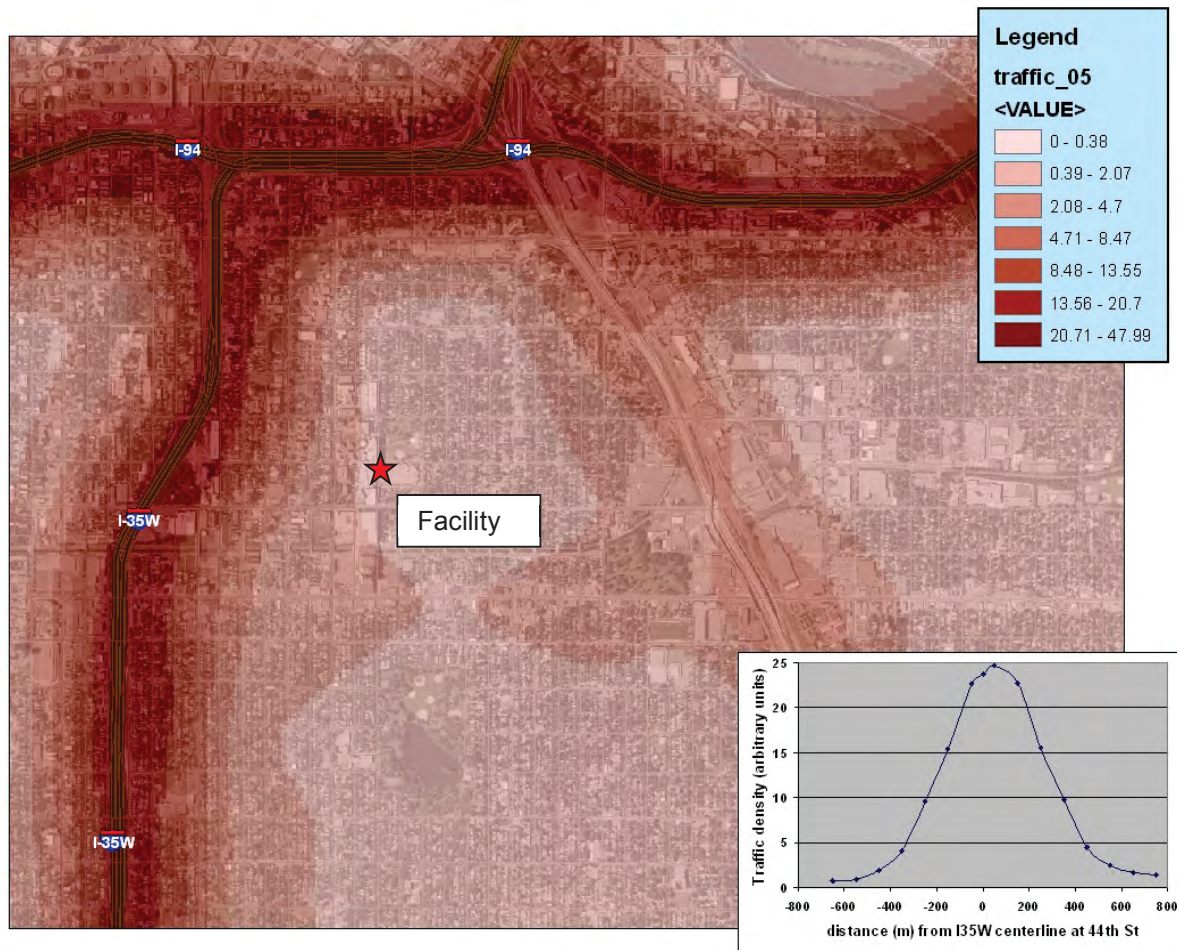
TABLE 4.3 - Traffic Density Near Study Area (2005)

TRACT	AREA	Traffic Density (vehicles/mile <sup>2</sup> )_Light Vehicle	Traffic Density (vehicles/mile <sup>2</sup> )_Heavy Vehicle
27053106000	0.220	390,047	12,484
27053007301	0.116	239,751	6,774
27053106200	0.304	728,209	23,088
27053104800	0.563	560,430	17,826
27053104700	0.371	416,611	10,267
27053106500	1.529	47,658	379
27053109900	1.539	143,481	2,177
27053109200	0.189	82,709	0
27053108000	0.265	108,917	0
27053106600	0.232	83,897	0
27053008100	0.243	80,403	0
27053106700	0.286	300,036	3,501
27053110800	0.496	533,264	8,280
27053110900	0.441	114,466	769
27053108700	0.435	191,783	7,141
27053108800	0.504	59,290	345
27053107500	0.599	59,973	1,173
27053107400	0.331	80,845	0
27053109300	0.334	553,057	8,738
27053008200	0.240	104,715	0
27053007700	0.266	111,704	0
27053107000	0.187	70,202	0
27053007801	0.101	1,239,404	21,041
27053110000	0.170	56,472	0
27053109400	0.171	238,109	2,415
27053009500	0.247	99,653	0
27053009600	0.322	32,690	0
27053008300	0.180	1,108,886	19,643
27053008400	0.177	110,777	0
27053007802	0.220	587,785	8,250
27053107100	0.175	711,554	16,414
27053011000	0.552	38,639	0
27053111100	0.896	46,173	1,162
27053110100	0.328	54,485	0
27053109700	0.205	72,277	0
27053008500	0.383	42,564	0
27053007900	0.195	107,298	0
27053107200	0.177	69,826	0
27053108600	0.260	57,772	0
27053007302	0.287	196,343	4,384
27053110200	0.454	96,058	2,843
27053006800	0.182	92,514	0
27053105600	0.182	1,390,998	53,990
27053105200	0.341	417,346	12,134
27053003501	0.574	536,538	21,979
27053106900	0.192	239,282	2,722
27053105700	0.111	1,581,622	58,219
27053005902	0.175	965,935	29,495
27053105400	0.212	107,441	0
27053005901	0.173	1,535,242	52,663
27053104400	0.300	250,438	3,211
27053104600	0.447	250,499	2,817
27053105500	0.616	465,066	17,559
27053106400	0.246	389,232	12,921
27053104900	1.077	267,175	6,483
County Average		163,960	4,717
State Average		74,594	2,299





FIGURE 4.3 – 2005 Traffic Density (arbitrary units)



#### 4.3.1 Minnesota/Federal Air Permitting Process

The Facility's air permit is classified as a federally enforceable state total facility operating permit because emissions are limited to less than the following limits:

- 100 tpy for criteria pollutants
- 10 tpy for a single hazardous air pollutant
- 25 tpy for combined hazardous air pollutants
- 100,000 tpy for greenhouse gasses.

Usually, a facility must emit greater than 250 tpy of a criteria pollutant before an AERA risk analysis is required by state law and would only be required to consider risk from the proposed facility and not from other sources. The federal permitting process does not require a risk analysis for this facility.



#### **4.3.2 Permitted Emissions Versus Actual Emissions**

The air permitting process requires the Facility to establish permit limits that cannot be exceeded under any circumstance. This requirement always results in a facility establishing permit limits greater than realistic actual operating levels. For instance, the GP001 boilers have a limit of 525 MMscf/yr of natural gas and 755,000 gal/yr of fuel oil. Using those limits, the boilers would have to operate at 100% load for 3,909 hours per year, which represents a 45% annual capacity factor. Based on the last ten years of data, the GP001 boilers have averaged 18% annual capacity factor, which means that actual emissions from those boilers are about 60% less than what is permitted. Likewise, the GP003 boilers are permitted to operate at a 100% capacity factor (8,760 hours per year); however actual use is closer to a 3% capacity factor (263 hours per year). Actual emissions from the Hospital have historically been lower than what is permitted and operations are expected to be similar in the future, which means the risks and impacts discussed in this Analysis are overstated.

Although actual emissions are expected to be significantly lower than permitted limits, the Facility requires the extra buffer between actual emissions and permitted limits in the event of an unforeseen event such as a natural gas supply issue that lasts for an extended time period. If such an event were to occur, the Facility would be required to operate the GP001 boilers on fuel oil to maintain the health and welfare of the patients and the resulting emissions would be closer to the permitted limits.

#### **4.3.3 MNRiskS/NATA**

MNRiskS is a software model developed by the MPCA and Lakes Environmental and is used to generate screening estimates of statewide human health risks from air exposures. The National Air Toxics Assessment Model (NATA) is a similar model used by the EPA. The MNRiskS model estimates multi-pathway impacts from air emission sources and the estimates are designed to be protective of human health. The MPCA uses this model to prioritize risk reduction. All air emission sources in the MPCA's emission inventory system are included in the model.

The model estimates risks from the following source categories:

- Point – Point sources of emission such as from a boiler stack
- Area – Emissions that are generated over an area, such as dust from a road or storage pile
- Non-road mobile – Vehicles and mobile emission sources not designed to operate on public roadways
- On-road mobile. – Vehicles designed to operate on public roadways

A summary of the results from the MNRiskS model and NATA model is presented in Table 4.3.3. The Facility emission sources are included in the Point Source category. The results show that the risks from point sources are relatively low when compared to mobile and area sources listed in the MNRiskS Model.



The numerical results represent the hazard indices. The numbers are used to prioritize where to focus efforts on reducing risk, therefore higher numbers indicate potentially higher risk. The MNRiskS and NATA models are more conservative than a refined AERA analysis and so the quantity of the numerical results is not appropriate for facility specific assessments.

**Table 4.3.3. Estimated Inhalation Non-Cancer Hazard Indices from Modeled Air Pollutants (Provided by MPCA)**

Census Tract	All Sources		Area Sources		On Road Mobile Sources		Non-Road Mobile Sources		Stationary Point Sources		Background Sources	
	MNRiskS	NATA	MNRiskS	NATA	MNRiskS	NATA	MNRiskS	NATA	MNRiskS	NATA	MNRiskS	NATA
27-053-59.01	4	8	1	2	2	3	1	1	0	1	1	2
27-053-73.01	3	5	1	1	1	1	1	0	0	1	1	2
27-053-73.02	3	5	1	1	1	1	1	0	0	1	1	2
27-053-78.02	3	5	1	1	1	1	1	1	0	1	1	2
27-053-79	2	6	1	1	0	1	0	0	0	2	0	2
27-053-84	3	4	1	1	1	1	1	0	0	1	1	2
27-053-85	2	6	1	1	0	1	1	0	0	2	1	2
27-053-95	2	4	1	1	0	1	0	0	0	1	0	2
27-053-84	3	5	1	1	1	0	1	0	0	2	1	2
27-053-1047	3	6	1	1	1	1	1	1	0	0	1	2
27-053-1048	3	7	1	1	1	2	1	1	0	1	1	2
27-053-106	1	7	1	1	0	1	0	0	0	2	0	2
27-053-1054	4	8	1	2	1	2	1	1	0	2	1	2
27-053-106	1	0	1	0	0	0	0	0	0	0	0	0
27-053-1062	3	6	1	1	1	1	0	0	0	1	0	2
27-053-1064	2	5	1	1	1	1	0	0	0	1	0	2
27-053-1071	4	6	1	1	1	1	1	0	0	1	1	2
27-053-1072	2	5	1	1	0	1	1	1	0	1	1	2
27-053-1074	2	10	1	1	0	0	1	0	0	7	1	2
27-053-1075	2	6	1	1	0	1	1	0	0	2	1	2
27-053-1076	2	4	1	0	0	0	0	0	0	1	0	2
27-053-1086	2	5	1	1	0	0	0	0	0	1	0	2
27-053-1087	2	5	1	1	0	0	0	0	0	1	0	2
27-053-1088	3	5	1	1	0	1	1	0	0	2	1	2
27-053-1089	2	5	1	1	0	0	0	0	0	1	0	2
27-053-1097	2	5	1	1	0	0	0	0	0	2	0	2
27-053-1101	2	5	1	1	0	0	0	0	0	2	0	2
27-053-1102	2	5	1	1	0	0	0	0	0	2	0	2
Hennepin County	2	3	1	0	1	0	0	0	0	1	0	1
Statewide	1	2	0	0	0	0	0	0	0	1	0	1

NATA = National Air Toxics Assessments

MNRiskS = Minnesota Risk Model

#### 4.3.4 What's in my Neighborhood

The Process Document requires the identification of all sites of environmental interest within the Study Area. As discussed in Section 2.4, the Study Area extends 3,100 meters from the Facility. A list of sites of environmental interest within the Study Area is provided by the MPCA from the What's in my Neighborhood (WIMN) database. See Appendix D for a list of sites from the database.



The WIMN search returned over 1,000 results, which is not surprising due to the urban location. The list of sites includes many entries which are considered to have low to no environmental interest due to the low potential exposure associated with WIMN entry. Examples of these entries includes facilities with storage tanks and no reported releases and stormwater permits.

With assistance from the MPCA, WIMN entries are systematically eliminated from further discussion if the entry has already been considered (such as in the MNRISKS model) or if the entry has low to no potential for environmental impact. The steps and reasons taken to remove entries from consideration are discussed below:

- **All Sites (Table D1)** contains all WIMN records within the Study Area and contains 1001 results.
- **All Active Sites (Table D2)** contains information in Table D1 with the inactive sites removed. Inactive sites no longer contribute to existing exposures (acute respiratory health effects and cardiovascular events) because the human health endpoint is limited to an hourly or daily exposure duration rather than lifetime exposures. If lifetime exposures were identified for refined analysis, inactive sites would be considered.
- **No Small to Minimum Hazardous Waste Sites (Table D3)** contains information in Table D2 with small to minimum hazardous waste sites removed. Small to minimum hazardous waste sites do not present a human health risk because they are regulated as hazardous waste generators. These regulations enforce appropriate management of waste generation, storage, transfer, and recordkeeping and are not expected to have potential exposures associated with the human health endpoints discussed in this Analysis.
- **No Air Permits (Table D4)** contains information in Table D3 with air permit sources removed. Sources with air permits are already accounted for in the MNRISKS model which is already discussed in this Analysis.
- **No Construction Stormwater (Table D5)** contains information in Table D4 with construction stormwater and wastewater sources removed. These sources are not expected to have potential exposures associated with the human health endpoints discussed in this Analysis because they are activities under the water regulatory programs which have existing controls. Additionally, the City of Minneapolis residents ingest municipal drinking water and therefore an exposure to ingestion of stormwater is not likely.
- **No Tanks (Table D6)** contains information in Table D5 with tanks records removed. These sources are not expected to have potential exposures associated with the human health endpoints discussed in this Analysis because they are either already considered in the MNRISKS model and/or are controlled by existing regulatory activities.
- **No Leaksites (Table D7)** contains information in Table D6 with leak site records removed. These sources are not expected to have potential exposures associated with the human health endpoints discussed in this Analysis because they are either already considered in the MNRISKS model, do not affect the applicable human health endpoints, or have completed regulatory activity at the site.
- **VIC Sites Past End Date or Completed (Table D8)** contains information in Table D7 with records removed that represent VIC sites that are past their end date or have been completed. These sources are not expected to have potential exposures associated with the human health endpoints discussed in this Analysis because they are past their end



dates or have been completed. These sites can still result in an inhalation exposure; however the potential for exposure is greatest during remediation.

- **Sites of Interest (Table D9)** contains information in Table D8 with records removed that the MPCA considers to have low enough risk to not be considered in this Analysis based on site specific information and/or emissions characterized in MNRISKS.

Table D9 identifies WIMN entries that were not eliminated. The remaining sources are assigned a Report ID and are discussed qualitatively below using information provided by the MPCA and from information in the WIMN database. A map showing the Facility location and the locations of each Report ID listed in Table D9 is included in Figure A12.

#### **Report ID #1 “1100 South 2<sup>nd</sup> Street Property” located 1.6 miles from the Facility**

This is currently a vacant vegetated lot that is listed as being in the Voluntary Investigative Cleanup (VIC) program (VP27710). There is proposed commercial development. There is historical rail usage and storage of fuel oil in aboveground storage tanks. The site is in the VIC program for a gasoline spill. Typically gasoline spills are events that threaten water and/or soil quality. The Facility's effect on water and soil quality at this location due to air emissions is negligible.

#### **Report ID #2 : “1316 East 24<sup>th</sup> Street” located 0.5 miles from the Facility**

This property is owned by the American Indian Community Development Corporation and Indian Health Board and includes a residential structure, a garage, and a shed and is in the VIC program (VP26760). A Phase I and Phase II assessment and soil borings have been conducted, and analytical testing has been completed for lead, arsenic, gasoline range organics (GRO), and diesel range organics (DRO). Typically, contaminated soil does not emit significant air pollution unless the soil is disturbed or is exposed to wind erosion. Further investigation and cleanup is expected to be limited since the EPA is already proposing to remove the top one to two feet of soil from the entire property in the ongoing arsenic cleanup process.

#### **Report ID #3: “2606 2<sup>nd</sup> Avenue South” located 0.6 miles from the Facility**

This site is eliminated from further discussion because the contaminant involved is Trichloroethylene which does not target the human health endpoints being discussed in this Analysis.

#### **Report ID #4: “29<sup>th</sup> Street Corridor Tunnel” located 0.3 miles from the Facility**

This site is a tunnel under the existing Sears building that is in the VIC program (VP16060). The MPCA requested that the top 3 inches of soil be removed prior to construction of the tunnel due to potential asbestos contamination. Exposure from the soil is only likely if the soil becomes airborne and is inhaled. Typically contractors removing contaminated soil take precautions to avoid significant human health risk due to inhalation during transport.



**Report ID #5: “312 Partnership LLC Property” located 1.7 miles from the Facility**

This site has had #1 and #2 fuel oil spills and is listed as a leak site (18408). The site is not yet in closure. The MPCA requested more work and a proposed closure date is March 2012, in which case this site should be closed before this proposed permit application is placed on public notice. If this site is closed by then, no further discussion is required.

**Report ID #6: “American Swedish Institute” location 0.2 miles from the Facility**

This is a petroleum brownfield site (3876). There are leak sites on this property that were closed in 2005. Phase I and Phase II assessments were conducted in 2009 and 2010 which showed the presence of DRO in the soil. A site response action plan/construction contingency has been prepared, approved by the MPCA and was carried out in 2011. A response action plan was approved on October 27, 2010.

**Report ID #7: “Bennett East Parcel” located 1.6 miles from the Facility**

This property is in the tanks and leaks program (4005). It is the former Bennett Lumber company site, which has seen numerous uses throughout the years including a fence company, creamery packaging company, sash and door company, lumber company, rubber and laundry equipment company, glass and woodworks company. Redevelopment is planned for apartment buildings. The soil contains detectable amounts of BaP (benzo-a-pyrene) and DRO.

**Report ID #8: “Buzza Historic Lofts” located 1.6 miles from the Facility**

This site is eliminated from further discussion because it entered the VIC program due to the possibility of groundwater impacts but not for vapor intrusion. There are no regulatory actions pending for this site.

**Report ID #9: “Calhoun Square” located 1.8 miles from the Facility**

This site is eliminated from further discussion. A no further action letter has been issued.

**Report ID #10: “CCLRT – Civil West (Sec 1,3,4)” located 2.0 miles from the Facility**

This site lies outside the Study Area and is therefore eliminated from further discussion.

**Report ID #11: “CCLRT – U of M Campus Sec 2)” located 2.0 miles from the Facility**

This site lies outside the Study Area and is therefore eliminated from further discussion.



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**Report ID #12: “Gas Holder #4 (U of M Underground Library OU1)” located 1.6 miles from the Facility**

This site is in the VIC program (VP10731). No further data is readily available through the WIMN database.

**Report ID #13: “Janesville Auto Transport Co” located 1.3 miles from the Facility**

This is a leak site (544 & 2890) that is currently listed as inactive and is therefore eliminated from further discussion.

**Report ID #14: “Leder Brothers Co” located 1.5 miles from the Facility**

This site is in the VIC program (VP20870). A response action plan has been received and approved by the MPCA. Work under the federal Resource Conservation and Recovery Act has concluded.

**Report ID #15 & 16: “MNDOT I35W Bridge” and “MNDOT I35W Bridge – Center Point Energy” located 1.8 miles from the Facility**

These sites are in the VIC program (VP20630 and VP23630C). No further data is readily available through the WIMN database.

**Report ID #17: “MNDOT I35W Bridge – City of Minneapolis” located 2.0 miles from the Facility**

This site lies outside the Study Area and is therefore eliminated from further discussion.

**Report ID #18, 19, 21: “MNDOT I35W Bridge – Metal Matic Inc”, “MNDOT I35W Bridge – Minneapolis Park Board”, “MNDOT I35W Bridge – U-CW Partnership LLP” located 1.5 miles from the Facility**

These sites are in the VIC program (VP23630G, D, I). No further data is readily available through the WIMN database.

**Report ID #20: “MNDOT I35W Bridge – Norton Building” located 1.5 miles from the Facility**

This site is in the VIC program (VP23630A). No further data is readily available through the WIMN database.

**Report ID #22: "Parcel F" located 1.6 miles from the Facility**

This site is in the VIC program (VP21870). No further data is readily available through the WIMN database.

**Report ID #23: "Pillsbury A Mill Complex" located 2.1 miles from the Facility**

This site lies outside the Study Area and is therefore eliminated from further discussion.

**Report ID #24: "Proposed Lunds on Hennepin" located 1.7 miles from the Facility**

This site is eliminated from further discussion because it is an inactive site.

**Report ID #25: "Rail Support Facility" located 1.0 miles from the Facility**

This site is in the VIC program (VP23940). No further data is readily available through the WIMN database.

**Report ID #26: "Theisen Vending Co - Mpls" located 1.6 miles from the Facility**

This site is in the VIC program (VP20580) and the tanks and leaks program (15984). The latest action is that a limited no action letter was issued under the VIC program. Additional details are not available in the tanks and leaks program.

**Report ID #27: "Tubs Inc" located 2.3 miles from the Facility**

This site is in the WIMN database because it is an open landfill and contains stipulations on dust emissions. This site is currently subject to regulation and is not discussed further. The site is also outside the Study Area.

**Report ID #28: "U of M – Spill Properties" located 2.0 miles from the Facility**

This site lies outside the Study Area and is therefore eliminated from further discussion. The site is also listed as an inactive site.

**Report ID #29: "U of M Bike Trail" located 2.0 miles from the Facility**

This site lies outside the Study Area and is therefore eliminated from further discussion.



**Report ID #30: “Uptown Rainbow Foods and Arbys” located 1.6 miles from the Facility**

This is a petroleum brownfield site (3885). Historical land uses have included dry cleaning, a battery manufacturer, chemical manufacturing, railroad, gas station, and possibly underground storage tanks. There is documented history of chlorinated groundwater. The current occupant proposes to redevelop the current store. An MPCA approved development response action plan exists and is directed toward tetrachlorethylene and DRO soil contamination. The current occupant is in the design phase.

***4.3.5 Particulate Matter Less than 2.5 Microns and Nitrogen Dioxide***

The Facility will emit PM<sub>2.5</sub> and NO<sub>2</sub> from the combustion of fuel oil and natural gas in boilers and internal combustion engines driving emergency generators. Emissions from emergency generators are not quantified in the AERA process because they only operate in the event of an emergency; however ambient impacts are quantified in the ambient air quality dispersion modeling based on a routine maintenance and test schedule. The resulting modeled concentrations assume the heating boilers operate continuously at 100% load. This is not an operating scenario that could happen in reality because the Hospital would not need the thermal energy produced by operating all the heating boilers at 100% load.

As discussed in 4.3.2, although the actual emissions will likely never reach permitted limits, the Facility needs the buffer between the permitted limits and expected actual operation in case of unforeseen events that cause them to operate on backup fuel to maintain the safety of patients.

***4.3.6 Perspectives on the Reference Document***

This section discusses topics referenced in the Reference Document.

**4.3.6.1 Indoor Air Quality**

The Reference Document states that indoor air quality is much more variable than outdoor air quality. Although outdoor air pollution can migrate indoors, there are many sources of air pollution that come from within the home (such as stoves, furnaces, candles, tobacco products, etc.) that increase risks due to indoor pollution. Because the risks from indoor air pollution are so variable, it is impractical to quantify them on a large scale. Outdoor air concentrations are used in this Analysis as a surrogate for personal exposure and human health risk.

**4.3.6.2 Traffic Related Air Quality**

This Facility generates air emissions associated with the health endpoints; however the risks from the emissions are small in comparison to the risks from mobile sources (including traffic). Figures C1 through C4 located in Appendix C show that the risk due to mobile sources (Figure C1) is higher than the risks associated with point sources (Figure C4). Even the highest risks from point sources are less than the lowest risks from mobile sources as shown in the figures. The highest areas of risk tend to be near



heavily trafficked areas such as the Interstate 94 and Interstate 35W corridors. The Reference Document reports that the risk from mobile sources is highest at the centerline of roadways and within 300 meters from the centerline, the risk due to traffic is indistinguishable from the urban background. This Facility is located approximately 700 meters from the nearest Interstate centerline.

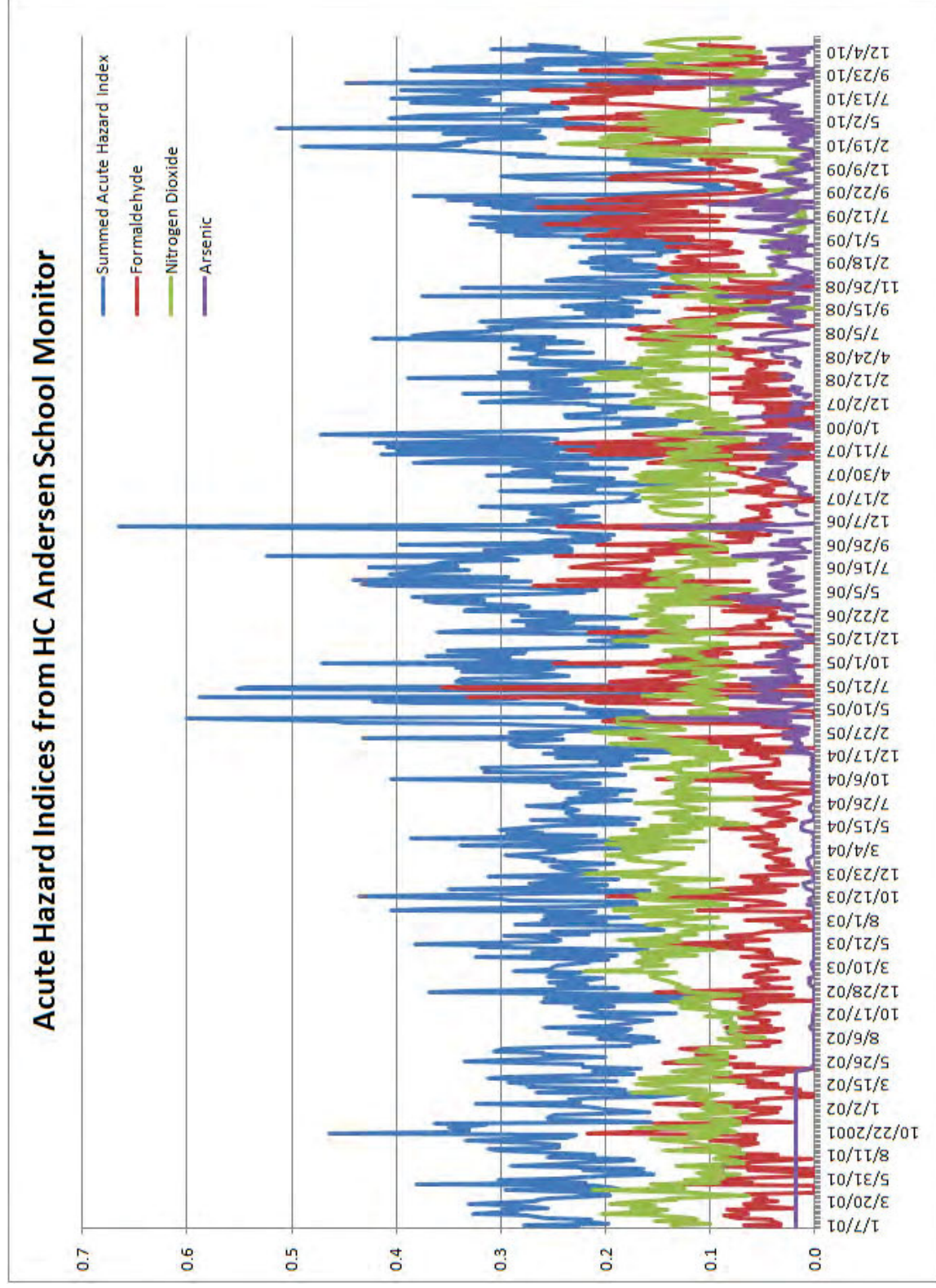
#### 4.3.6.3 Air Toxics

Figure 4.3.6.3 shows that the total acute hazard index as determined from monitored concentrations has ranged from approximately less than 0.05 to 0.7 from January 7, 2001 to December 14, 2010 at the HC Anderson School Monitor. NO<sub>2</sub> accounts for up to 0.25 of the total risk. The MNRiskS information in Table 4.3.3 shows that the risk from inhalation for the Study Area is between 1 and 4. The contribution of point sources to the total risk varies from 0 to 1. The Facility is considered a point source with a maximum ground level acute inhalation risk of 0.6. The ground level impact decreases rapidly as distance from the Facility increases. For example, the total risk from the Facility is less than 0.3 at a distance of approximately 200 meters. Greater than 95% of the acute risk from the Facility is from NO<sub>2</sub>. The Facility meets federal NAAQS for NO<sub>2</sub>.

The primary pollutants contributing to the risks presented in Figure 4.3.6.3 are NO<sub>2</sub>, formaldehyde, and arsenic. Formaldehyde and arsenic are not above the screening levels identified in this Analysis. None of these pollutants are over a facility risk guideline. NO<sub>2</sub> is generally only formed as a byproduct of combustion and is produced from sources such as the combustion of natural gas, gasoline, diesel or other combustible materials. Formaldehyde is produced from several indoor and outdoor sources including the off gassing of pressed wood products, tobacco smoke, gas stoves, fireplaces, and other combustion processes. Acute exposure to NO<sub>2</sub> and formaldehyde product similar respiratory symptoms.



FIGURE 4.3.6.3





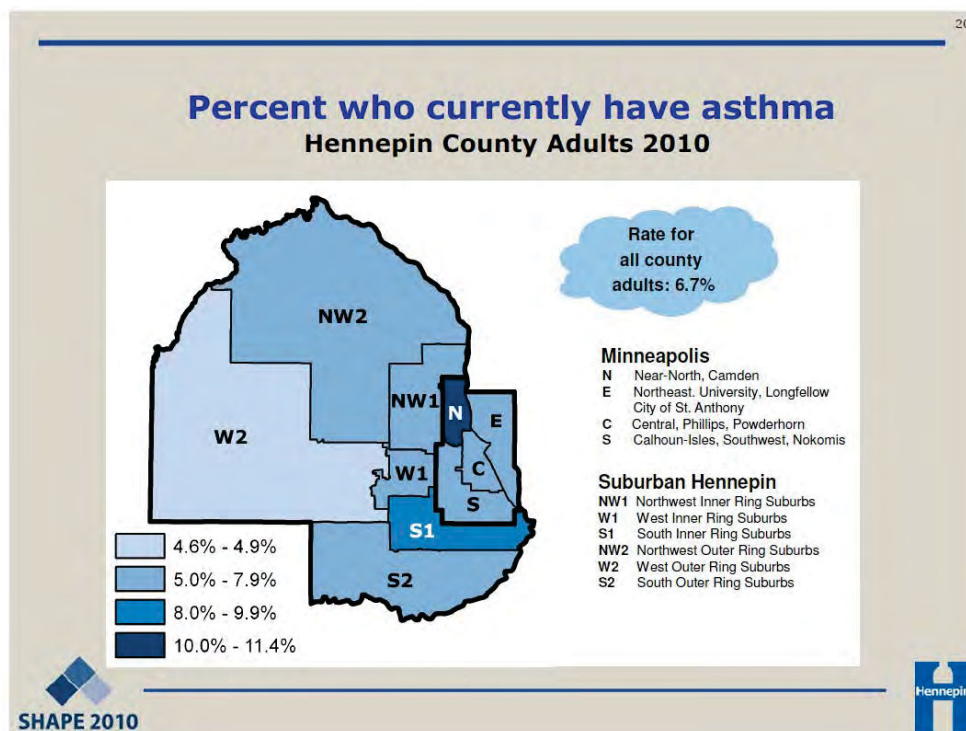
#### 4.3.6.4 Respiratory/Olfactory Endpoint (Asthma)

The Reference Document identifies asthma as an acute respiratory endpoint. The Reference Document identifies that a disproportionate number of hospitalization and emergency room visits occur in the Statute Area described by the Statute. Asthma is a chronic disease and is sometimes triggered by acute events such as:

- Exposures to air pollution
- Lack of access to health care
- Life style choices
- Emotional stress; and
- Temperature fluctuations

Asthma is a chronic disease with occasional episodes which can be triggered by acute events, for example temperature changes, stress, or exposure to some air pollutants. Figure 4.3.6.4 shows the percentage of population that currently has asthma. Health data on the cardiovascular endpoint for ZIP codes in the Statute Area and local/state averages are provided by the MPCA and presented in Table 4.3.6.4.

FIGURE 4.3.6.4





Source: *SHAPE 2010 Adult Data Book, Survey of the Health of All the Population and the Environment*, Hennepin County Human Services and Public Health Department, Minneapolis, Minnesota, March 2011.



TABLE 4.3.6.4 - Asthma Health Data 2007-2009				
2007-2009	Hospitalizations		ED visits	
Counts	0-17	18+	0-17	18+
55404	91	119	630	741
55407	125	127	841	615
55408	57	74	447	411
55454	5	28	95	83
Minneapolis	801	1,324	5,287	6,221
St. Paul	457	755	3,239	3,239
Minnesota	4,282	8,588	25,367	35,042
Population	0-17	18+	0-17	18+
55404	10,115	22,661	10,115	22,661
55407	13,718	29,270	13,718	29,270
55408	9,500	25,631	9,500	25,631
55454	4,704	6,914	4,704	6,914
Minneapolis	87,582	341,894	87,582	341,894
St. Paul	78,315	237,513	78,315	237,513
Minnesota	1,284,063	4,019,862	1,284,063	4,019,862
Age-adjusted rates per 10,000	Hospitalizations		ED visits	
	0-17	18+	0-17	18+
55404	37.2	23.4	251.0	122.1
55407	29.1	17.7	199.6	68.8
55408	24.9	15.8	190.1	62.9
55454	7.9	23.5	134.1	67.8
Minneapolis	27.8	14.8	187.5	60.6
St. Paul	18.3	11.5	131.1	45.9
Minnesota	10.9	7.0	65.2	29.0

= unstable rate: based on count <20

**Source:** Minnesota Hospital Association; 2010 US Census

**Notes:**

Asthma hospitalization and emergency department (ED) visit rates are age-adjusted to the 2000 US standard. Asthma ED visit rates in this table include ED visits that resulted in admission to the hospital. Asthma hospitalizations/ED visits are defined as those for which asthma was the principal diagnosis. Zip code is that of the patient's residence. Minnesota hospitals report data on inpatient and outpatient visits on a voluntary basis to the Minnesota Hospital Association. Currently over 95% of hospitalizations/ED visits are reported; however this does not include data from federal and sovereign hospitals (e.g., Veteran's Administration and Indian Health Service). Because MDH does not receive information that would allow us to identify individuals, these rates are based on the number of hospitalizations/ED visits in a particular year, not the number of people who were hospitalized/went to the ED in that year (i.e., we cannot identify repeat hospitalizations/ED visits).

-Minnesota Department of Health Asthma Program, 1/23/2012





According to information provided by the MPCA, “There are many triggers for asthmatic episodes, including exposure to tobacco smoke, pollen, temperature changes, stress, or air pollutants. The Asthma and Allergy Foundation of America completes an annual study ranking cities from the best to worst places to live with the condition of asthma. Data such as access to medications, asthma prevalence, pollen scores, public smoke free laws, school inhaler access laws, poverty rates, uninsured rates, and air quality markers are used to calculate the ranks. Minneapolis is consistently one of the better cities to live in for asthmatics. In 2011, Minneapolis ranked 89<sup>th</sup> out of 100 cities, with 1 being the worst city in which to live for asthmatics. Minneapolis was ranked 100<sup>th</sup> in 2010. In 2011, high pollen counts, higher asthma prevalence factors and medical factors contributed to Minneapolis’s ranking of 89<sup>th</sup>.”

The Reference Document indicates that the Statute Area has a higher percentage of respondents reporting no health insurance when compared to state averages for both adults and children. Asthma is a condition which can require medications to control symptoms. A lack of health insurance is one indicator that the population in the Statute Area may not have access to proper medications which could increase the rate of hospitalizations and emergency room visits due to asthma attacks.

According to the MPCA, there are many factors that contribute to good or poor respiratory and cardiovascular health. The SHAPE 2010 Adult Data Book indicates that portions of the statute area contain a higher percentage of respondents reporting no health insurance, lower fruit and vegetable consumption, lower rates of leisure time activity levels, and higher smoking rates than less densely populated areas of the county. The causation of these risk behaviors are quite complex and beyond the scope of this analysis, however they are contributors to overall population health.

The health risk models require emission rates to represent maximum permitted rates. Maximum permitted rates assume that many of the boilers operate continuously at 100% load throughout the year. In reality, the Facility would not require the amount of thermal energy produced from such an operating scenario. Because of this, the health impacts quantified in this Analysis are overestimated.

#### 4.3.6.5 Cardiovascular Endpoint (Ischemic Heart Disease)

The modeled ground level concentrations of PM<sub>2.5</sub> from the Facility exceed the screening levels discussed in the Process Document and thus the associated health endpoints are discussed in this Analysis. The health endpoint associated with 24-hr PM<sub>2.5</sub> exposure is cardiovascular effects, specifically ischemic heart disease. Health data on the cardiovascular endpoint for ZIP codes in the Statute Area and local/state averages are provided by the MPCA and presented in Table 4.3.6.5.



TABLE 4.3.6.5 - CARDIOVASCULAR HEALTH DATA		
2007-2009	AMI Hospitalizations	Stroke Hospitalizations
Hospitalizations	Ages 35+	Ages 35+
55404	88	128
55407	108	134
55408	77	69
55454	15	13
Minneapolis	1,369	1,844
St. Paul	1,165	1,716
Minnesota	21,277	25,395
Population		
55404	10,469	10,469
55407	15,750	15,750
55408	10,775	10,775
55454	2,173	2,173
Minneapolis	192,911	192,911
St. Paul	141,940	141,940
Minnesota	2,801,477	2,801,477
Age-adjusted rate per 10,000	AMI Hospitalizations	Stroke Hospitalizations
55404	28.4	42.7
55407	29.4	35.7
55408	30.1	27.4
55454	20.1	18.7
Minneapolis	25.3	34.6
St. Paul	27.6	41.7
Minnesota	23.8	28.9

= unstable rate: based on count <20

**Source:** Minnesota Hospital Association; US Census

**Notes:**

Acute myocardial infarction (AMI) & stroke hospitalization visit rates are calculated by dividing the number of hospitalizations visits in a particular year by the number of residents for that year (based on population estimates from the US Census) and multiplying by 10,000 to get rates per 10,000 residents. AMI and stroke hospitalizations are defined as those for which AMI or stroke was the principal diagnosis. Zip code is that of the patient's residence. Minnesota hospitals report data on inpatient and outpatient visits on a voluntary basis to the Minnesota Hospital Association. Currently over 95% of hospitalizations/ED visits are reported; however this does not include data from federal and sovereign hospitals (e.g., Veteran's Administration and Indian Health Service). Because MDH does not receive information that would allow us to identify individuals, these rates are based on the number of hospitalizations visits in a particular year, not the number of people who were hospitalized in that year (i.e., we cannot identify repeat hospitalizations).

-Minnesota Department of Health Heart Disease & Stroke Prevention Unit, 1/23/2012





The Reference Document notes that there is a higher age-adjusted heart disease mortality rate among American Indians compared to white counterparts. This disparity has not been linked to differing exposures to environmental pollutants; however it could be linked to pre-existing conditions and/or vulnerabilities.

Overall, the data in Table 4.3.6.5 indicates that the population in the Statute Area experiences a slightly higher rate of hospitalizations for AMI and a slightly lower rate of hospitalization for stroke when compared to the Minneapolis rate.

The contribution of PM<sub>2.5</sub> emissions and associated risk from the Facility is expected to be lower than what is presented in this Analysis for the same reasons discussed in Section 4.3.6.4, which will result in a lower estimated health risk.

The following excerpt provided by the Minnesota Department of Health provides more information regarding the relationship between PM<sub>2.5</sub> exposure and heart disease:

*In 2009, EPA drafted the Integrated Science Assessment for Particulate Matter (EPA, 2009\_DRAFT) for public review. Causality determination for short-term exposure to PM<sub>2.5</sub> includes a causal relationship with cardiovascular morbidity. Cardiovascular health effect indicators are complex and range in severity from subtle changes in heart rate variability to hospitalizations due to cardiovascular irregularities. Results from epidemiological studies, human clinical studies, and toxicological studies have observed associations between ischemic heart disease and short-term exposures to fine particulate matter.*

*The Minnesota Department of Health (MDH) collects, analyzes and reports on heart disease and mortality data for the state of Minnesota. Although heart disease outcomes have been found to have a causal relationship with elevated levels of PM<sub>2.5</sub>, there are many risk factors that also cause and/or exacerbate heart disease such as diet, smoking status, activity levels, etc. Similar to other environmental health data, these data should be discussed with appropriate qualifications.*

*One of the reports published by the MDH is the Burden Report on Heart Disease and Stroke in Minnesota. Within this report, disparities are discussed by ethnic, socioeconomic and regional groups of people. One disparity of note, is a much higher age-adjusted heart disease mortality rate among American Indians compared to white counterparts. This disparity is higher for men than women. The decline in mortality from 1991-1995 to 2001-2005 has been much less pronounced in American Indians, Asians, and Hispanics than in whites or African Americans. These disparities have not been linked to differing exposures to environmental pollutants, however the populations in these groups may be more susceptible to health effects from environmental pollutant exposures due to pre-existing conditions and vulnerabilities, or different levels of environmental pollutant exposure due to place of residence. A recent report from Wilder Research and the Blue Cross and Blue Shield Foundation of Minnesota found significant disparities in life expectancy across Twin Cities zip codes, all of which was highly correlated with race, ethnicity, income, and education attainment.<sup>8</sup>*

<sup>8</sup> Citations: *Heart Disease and Stroke in Minnesota: 2007 Burden Report*. Minnesota Department of Health, St. Paul, MN. September 2007

*The unequal distribution of health in the Twin Cities*. Amherst H. Wilder Foundation, St. Paul, MN. October 2010.



#### 4.3.6.6 Socioeconomic Status

The Process Document requires the Facility to discuss socioeconomic aspects for the Statute Area. Table 4.3.6.6 shows average household income and percent of the population that identified as a race other than “white” on the 2010 census for census tracts within the Study Area and local/state averages.



TABLE 4.3.6.6 - CENSUS TRACT INFORMATION FOR STUDY AREA					
Study Area Census Tracts	Total Population	Minority Population	Percent of Population Minority	Household Income	
				Annual Average	Margin of Error ±
27053005901	3,166	1,772	56	\$19,923	\$4,544
27053005902	3,198	2,339	73	\$21,063	\$3,977
27053006800	3,827	1,149	30	\$34,493	\$3,310
27053007700	2,618	1,210	46	\$44,222	\$7,400
27053007801	1,693	1,279	76	\$28,167	\$7,445
27053008100	3,393	565	17	\$50,417	\$6,274
27053008200	4,534	2,726	60	\$30,071	\$5,965
27053008300	2,221	1,699	77	\$39,408	\$8,047
27053008400	2,720	2,018	74	\$43,145	\$17,707
27053008500	4,396	2,722	62	\$41,700	\$10,880
27053009500	3,083	2,082	68	\$56,397	\$8,419
27053009600	3,436	1,552	45	\$45,969	\$6,025
27053104100	3,211	2,283	71	\$35,054	\$7,092
27053104400	2,097	925	44	\$45,550	\$12,895
27053104800	8,094	5,088	63	\$15,193	\$3,659
27053104900	9,982	2,720	27	\$16,600	\$2,648
27053105100	2,651	281	11	\$87,188	\$14,542
27053105201	2,717	592	22	\$48,058	\$10,196
27053105204	2,293	778	34	\$19,303	\$4,003
27053105400	3,527	1,395	40	\$27,878	\$5,705
27053105500	3,732	406	11	\$56,905	\$15,147
27053105600	3,970	933	24	\$29,648	\$5,964
27053105700	2,725	1,080	40	\$22,907	\$4,522
27053106000	3,339	2,774	83	\$18,512	\$3,872
27053106200	3,499	2,065	59	\$17,537	\$3,668
27053106400	1,821	842	46	\$21,387	\$8,696
27053106500	4,367	486	11	\$109,792	\$20,655
27053106600	2,332	253	11	\$63,333	\$7,787
27053106700	4,913	787	16	\$39,660	\$4,837
27053106900	2,724	900	33	\$36,164	\$3,866
27053107000	4,063	2,361	58	\$28,895	\$3,956
27053107400	1,726	748	43	\$37,382	\$9,395
27053107500	1,988	374	19	\$47,933	\$8,296
27053107600	3,504	561	16	\$61,911	\$5,707
27053108000	3,295	371	11	\$56,279	\$8,951
27053108600	2,880	1,721	60	\$38,750	\$12,191
27053108700	3,274	1,293	39	\$51,008	\$12,024
27053108800	3,786	1,723	46	\$42,625	\$12,416
27053108900	2,280	436	19	\$68,024	\$9,111
27053109200	3,413	668	20	\$37,639	\$4,281
27053109300	3,991	1,405	35	\$53,779	\$5,352
27053109400	2,161	1,812	84	\$35,156	\$19,474
27053109700	2,252	1,025	46	\$43,125	\$12,449
27053109900	3,783	692	18	\$64,813	\$9,477
27053110000	1,673	1,360	81	\$38,021	\$12,716
27053110100	2,735	883	32	\$48,913	\$10,127
27053110200	3,522	925	26	\$54,554	\$7,252
27053110400	2,733	697	26	\$51,875	\$6,917
27053125600	2,898	577	20	\$58,378	\$16,310
27053125800	4,782	3,697	77	\$38,429	\$4,216
27053125900	4,269	3,560	83	\$30,833	\$11,947
27053126000	4,727	3,532	75	\$17,342	\$5,677
27053126100	4,939	1,810	37	\$65,340	\$9,458
27053126200	4,292	1,227	29	\$80,446	\$11,612
TOTAL/AVG STUDY AREA	185,246	79,159	43	\$41,736	not available
HENNEPIN CO		not available	30	\$63,770	not available
MINNESOTA		not available	14	\$58,734	not available

Information in this Table provided by MPCA

The data in Table 4.3.6.6 shows that 43% of the population in the Study Area classifies themselves as a minority, which is higher than the Hennepin County or statewide averages. The average income for the



Study Area is \$41,736, which is lower than the Hennepin County or statewide averages. Socioeconomic status is sometimes linked to health problems. This link could be due to access to health care, stress, lower nutrition, lower education, lower incomes, and lower quality of housing when compared to the statewide averages to name a few.

No conclusions are identified that link socioeconomic status to increase health risks from this Facility.

#### 4.3.6.7 Tobacco Use

The presence of tobacco smoke has a negative effect on indoor air quality. Smoking tobacco (including cigarettes, pipes, cigars, etc) creates some of the same byproducts as produced from this Facility.

The data in Table 4.3.6.7 shows statistics for smokers in Hennepin County and for the Central/Phillips/Powderhorn neighborhood.

TABLE 4.3.6.7 - TOBACCO USE STATISTICS								
	Every Day Smoker		Some Days Smoker		Former Smoker		Never Smoked	
Statistical Area	%	± 95% C.I.	%	± 95% C.I.	%	± 95% C.I.	%	± 95% C.I.
Central, Phillips, Powderhorn Neighborhoods	9.2%	± 2.8	6.2%	± 3.5	24.8%	± 4.4	57.8%	± 2.8
City of Minneapolis	9.8%	± 1.6	6.6%	± 1.4	24.0%	± 2.2	59.6%	± 1.6
Hennepin County	7.2%	± 0.9	4.9%	± 0.8	26.6%	± 1.5	61.4%	± 1.7
Information from SHAPE 2010 Adult Data Book, Hennepin County Human Services and Public Health Dept.								

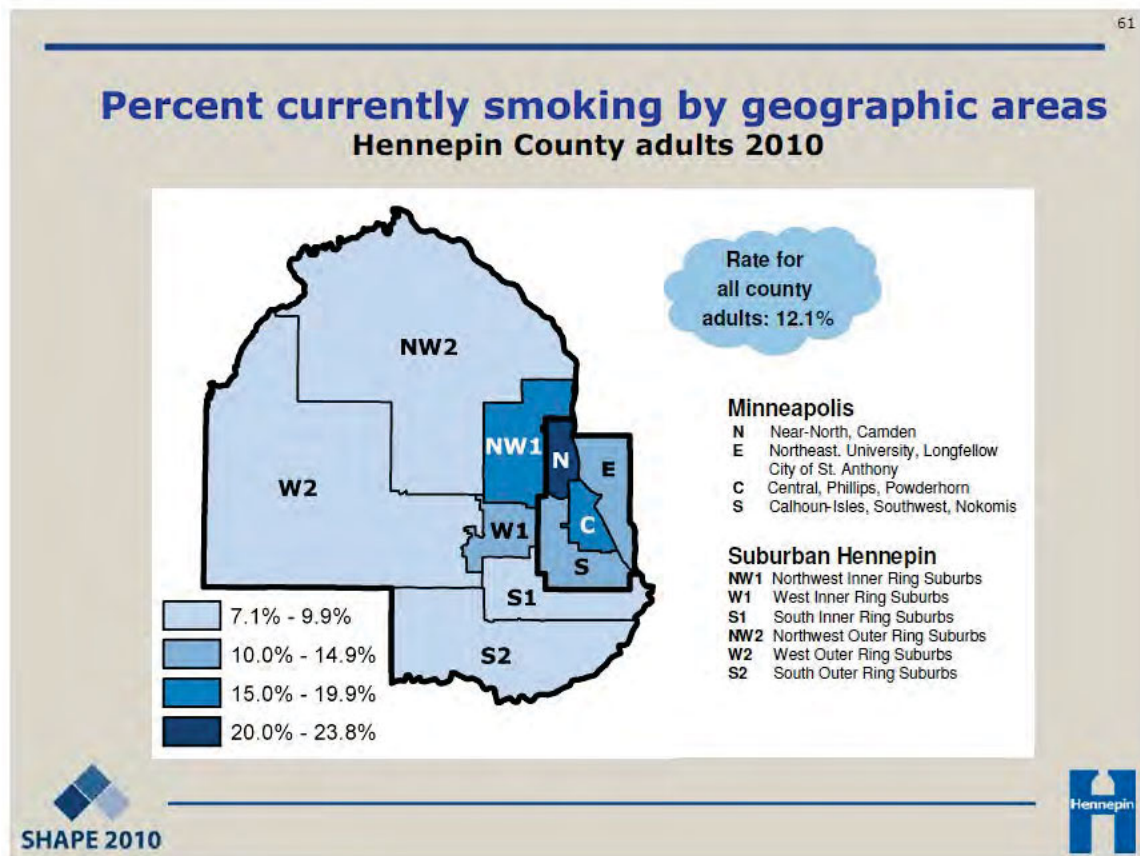
Data in Table 4.3.6.7 suggests that the population in the Phillips/Central/Powderhorn neighborhood contains a larger percentage of smokers than Hennepin County and less than the City of Minneapolis.

Table 4.3.6.7 contains data from Table 78 of the SHAPE 2010 Adult Data Book and shows statistics on the percentage of population that has tried to quit smoking in the last 12 months. The data suggest that the Central/Phillips/Powderhorn neighborhood has a higher percentage of population that is trying to quit smoking when compared to the City of Minneapolis and Hennepin County; however the margins of error are large enough that it is difficult to quantify.

Figure 4.3.6.7 is a graphical representation of the data in Table 4.3.6.7.



FIGURE 4.3.6.7



Source: *SHAPE 2010 Adult Data Book, Survey of the Health of All the Population and the Environment*, Hennepin County Human Services and Public Health Department, Minneapolis, Minnesota, March 2011



## 5.0 CLOSING

The presentation of data in this Analysis is intended to satisfy the requirements of Minnesota Statute 116.07 Subd 4a. The human health risks from this Facility are within the levels that the MPCA and EPA consider to be protective of human health and welfare. If there are any technical questions regarding this Analysis, please contact the undersigned at 651-697-9737.

This report was prepared for the exclusive use of Abbott Northwestern Hospital. Any use which a third party makes of this report, or any reliance on or decisions to be made based on it, are the responsibility of such third parties. Golder accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report.

### GOLDER ASSOCIATES INC.

A handwritten signature in black ink, appearing to read "Ryan Birkenholz".

Ryan Birkenholz, P.E.  
Sr. Project Engineer

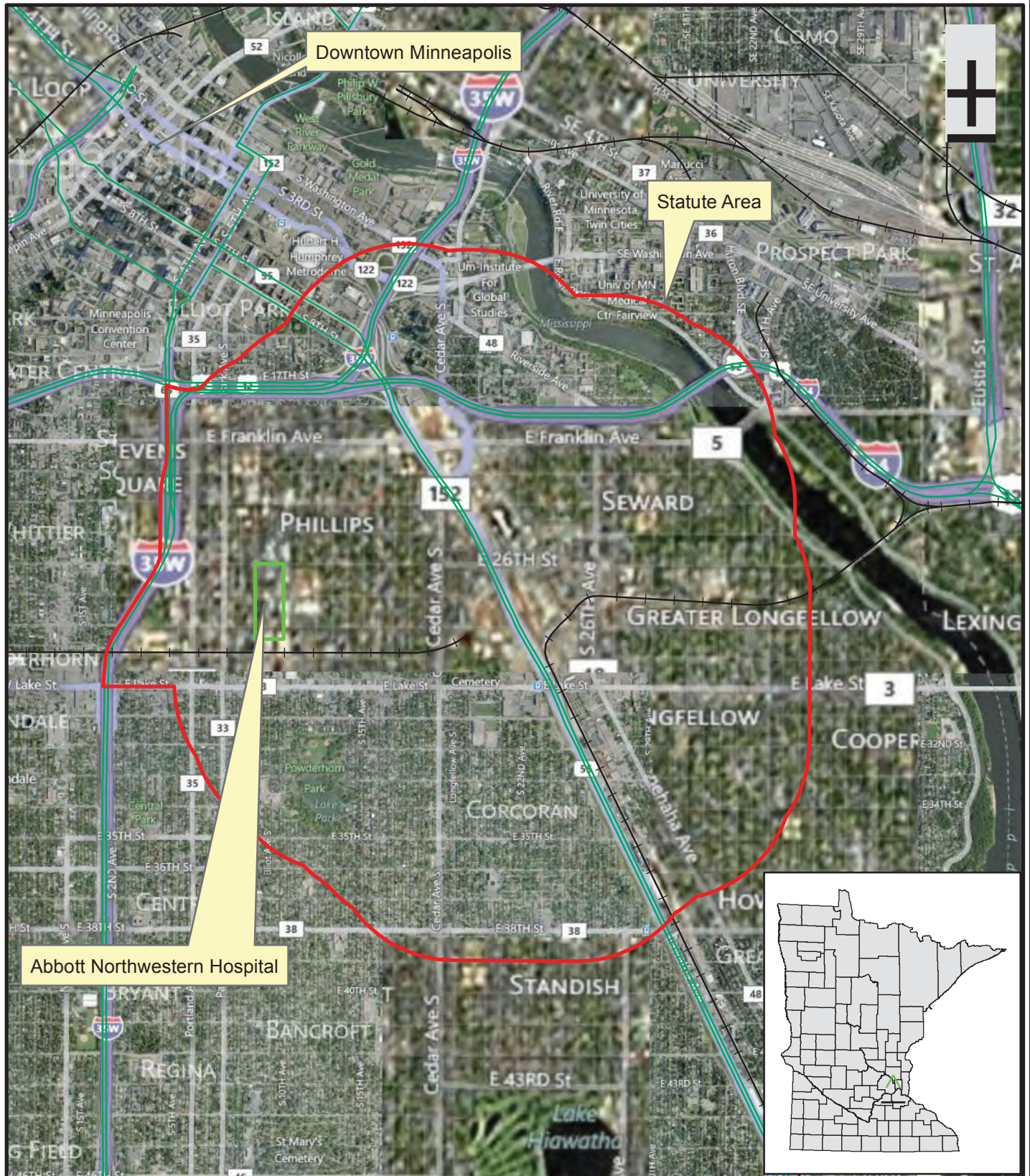
A handwritten signature in black ink, appearing to read "Bruce A. Labno".

Bruce A. Labno, M.S.  
Sr. Consultant

APPENDIX A

Supplemental Figures





#### REFERENCE

Background Image: ArcGIS Basemap Image

0 0.5 1 2 Kilometers



DATE	NOV 14, 2011
DESIGN	RCB
GIS	RCB

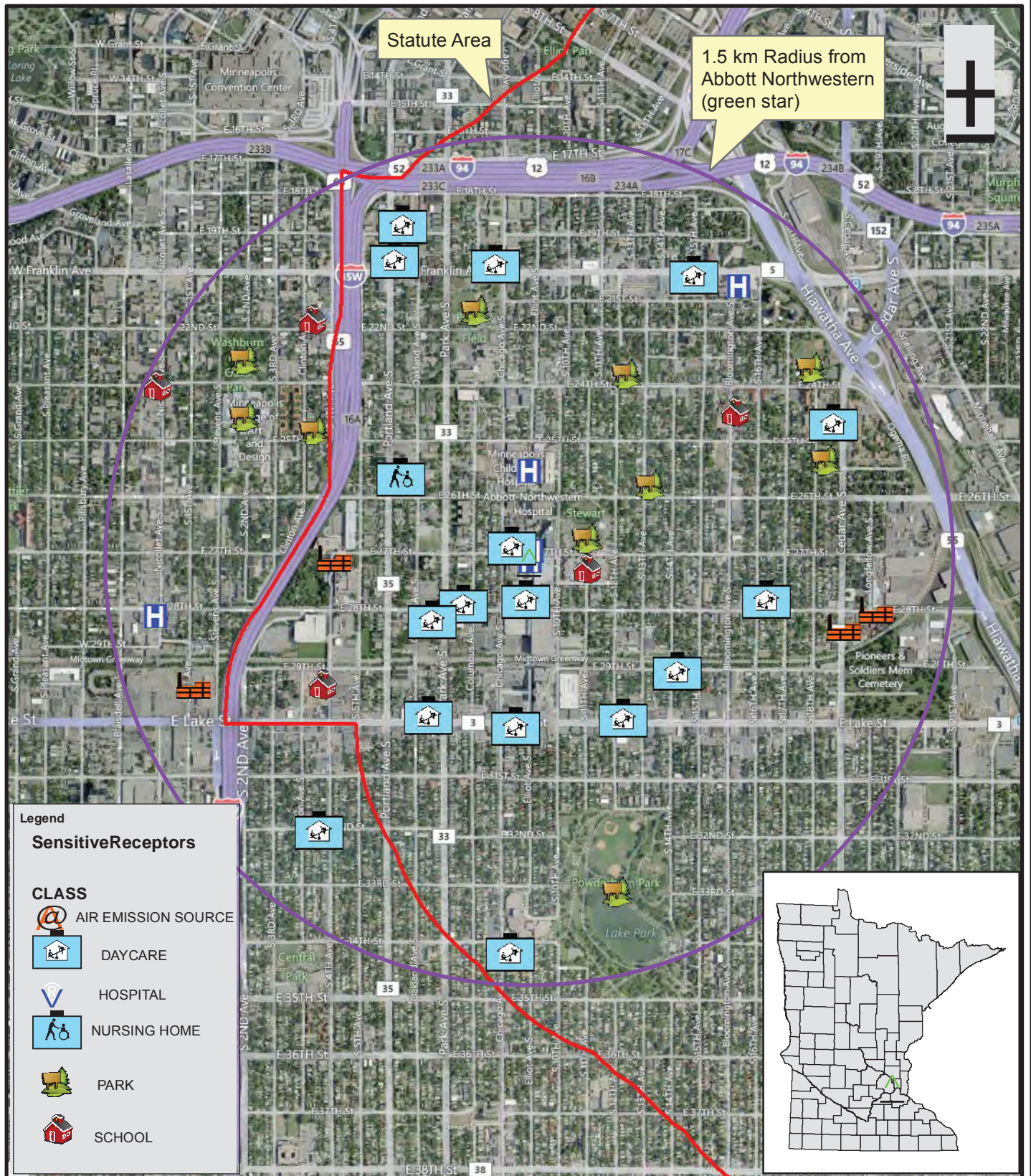
TITLE	SITE LOCATION	
-------	---------------	--

PROJECT No.	103-81295
SCALE	As Indicated
REV.	0

CHECK	
REVIEW	

PROJECT	Abbott Northwestern Hospital 800 28th Street East, Minneapolis, MN	FIGURE: A1
---------	---	------------





DATE NOV 14, 2011  
DESIGN RCB  
GIS RCB

TITLE **SENSITIVE RECEPTORS AND AIR EMISSION SOURCES WITHIN 1.5 KM**

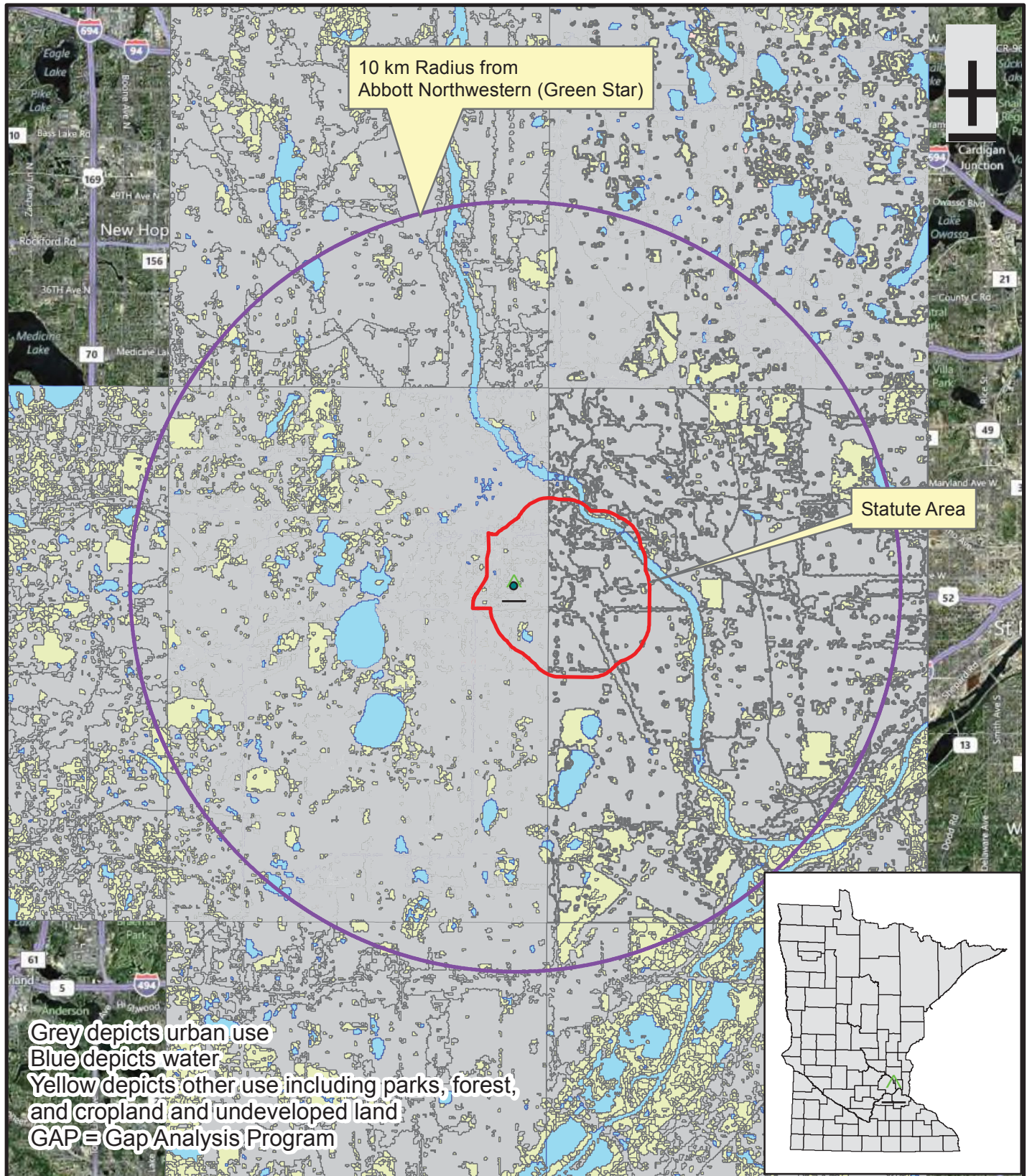
PROJECT No. 103-81295  
SCALE As Indicated  
REV. 0

CHECK  
REVIEW

PROJECT Abbott Northwestern Hospital  
800 28th Street East, Minneapolis, MN

FIGURE: A2





#### REFERENCE

Background Image: ArcGIS Basemap Image,  
Land Use from MN GAP Data downloaded from Minnesota DNR Data Deli

0 2 4 8 Kilometers



DATE NOV 14, 2011  
DESIGN RCB  
GIS RCB

TITLE

## LAND USE (GAP) WITHIN 10 KM

PROJECT No. 103-81295

CHECK

PROJECT Abbott Northwestern Hospital  
800 28th Street East, Minneapolis, MN

FIGURE: A3

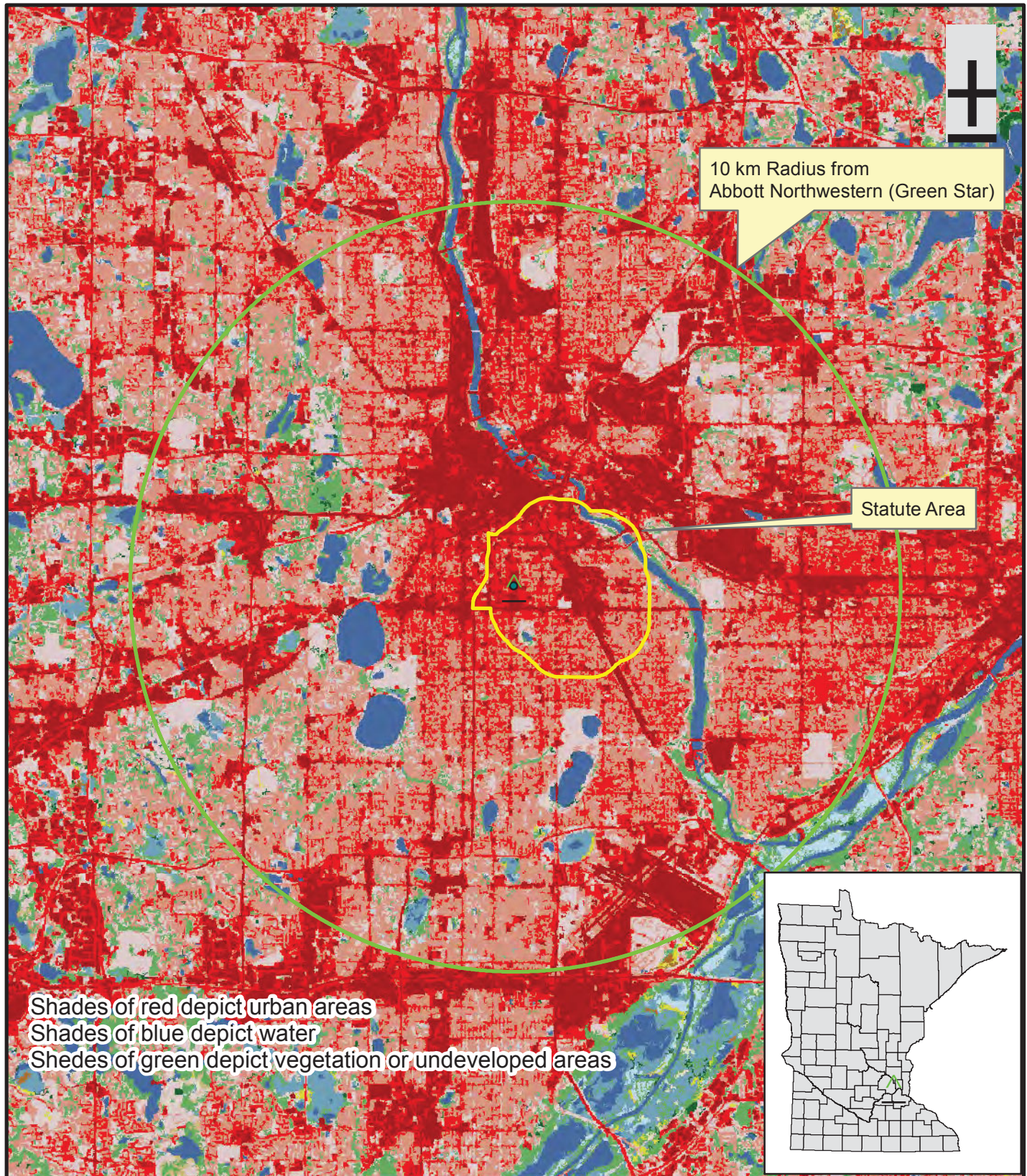
SCALE As Indicated

REV. 0

REVIEW



Project: 2\J2005\GIS\ArcMap\Templates\611\MyProject.mxd?\_Plot=2\J2005\GIS\ArcMap\Templates\611\MyProject.pdf?



#### REFERENCE

Land Use from 2006 National Land Cover Database (NLCD)

0 2 4 8 Kilometers



DATE	NOV 14, 2011
DESIGN	RCB
GIS	RCB

TITLE

## LAND USE (NLCD) WITHIN 10 KM

PROJECT No. 103-81295

CHECK

PROJECT Abbott Northwestern Hospital  
800 28th Street East, Minneapolis, MN

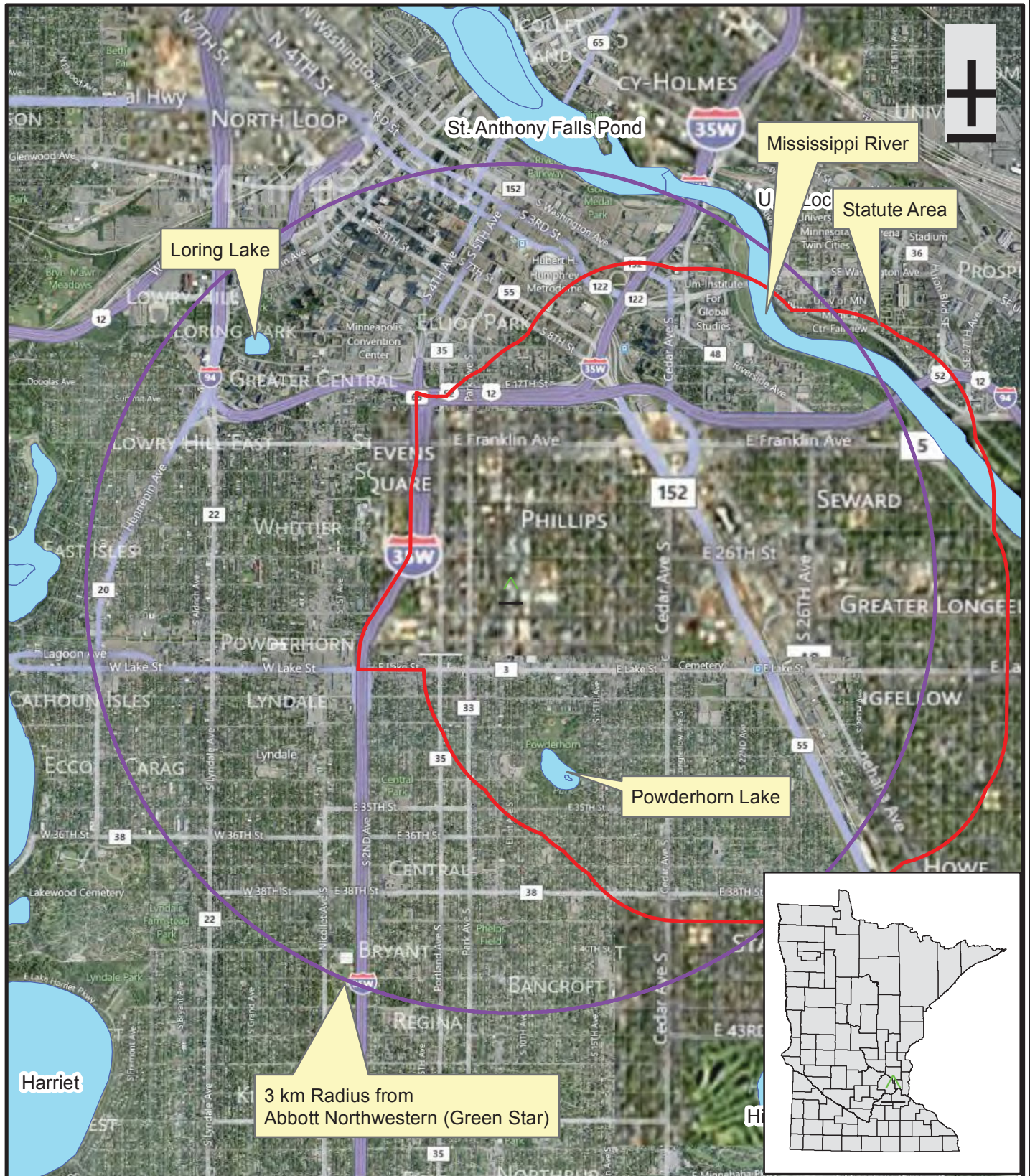
SCALE As Indicated

REV. 0

REVIEW

FIGURE: A4





#### REFERENCE

Background Image: ArcGIS Basemap Image. Water layer from MN DNR Data Deli.

0 0.5 1 2 Kilometers



DATE	NOV 14, 2011
DESIGN	RCB
GIS	RCB

TITLE  
**FISHABLE BODIES OF WATER  
WITHIN 3 KM**

PROJECT No. 103-81295

CHECK

PROJECT Abbott Northwestern Hospital  
800 28th Street East, Minneapolis, MN

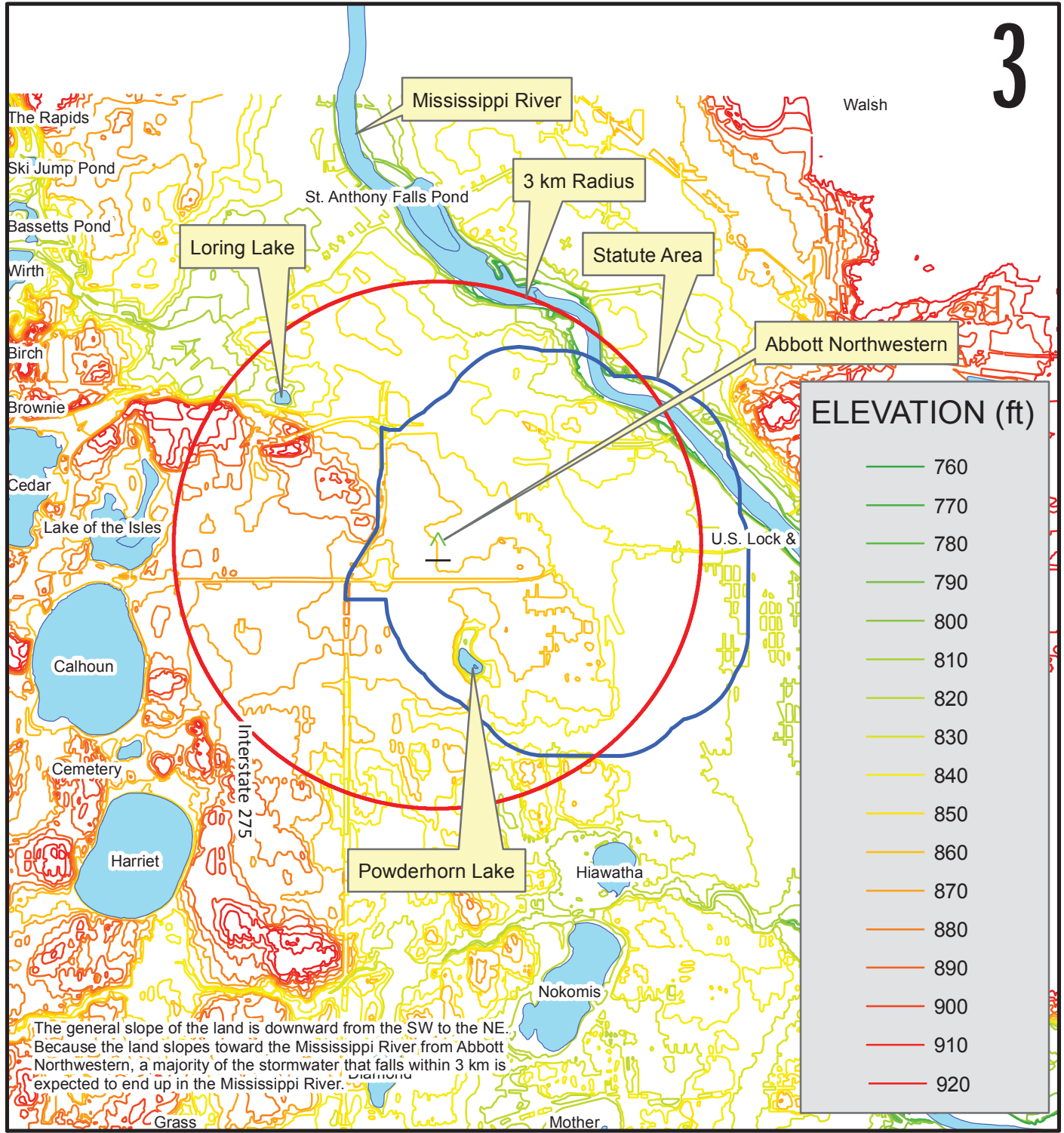
FIGURE: A5

SCALE As Indicated

REV. 0

REVIEW





## REFERENCE

Information obtained from Minnesota DNR Data Deli.



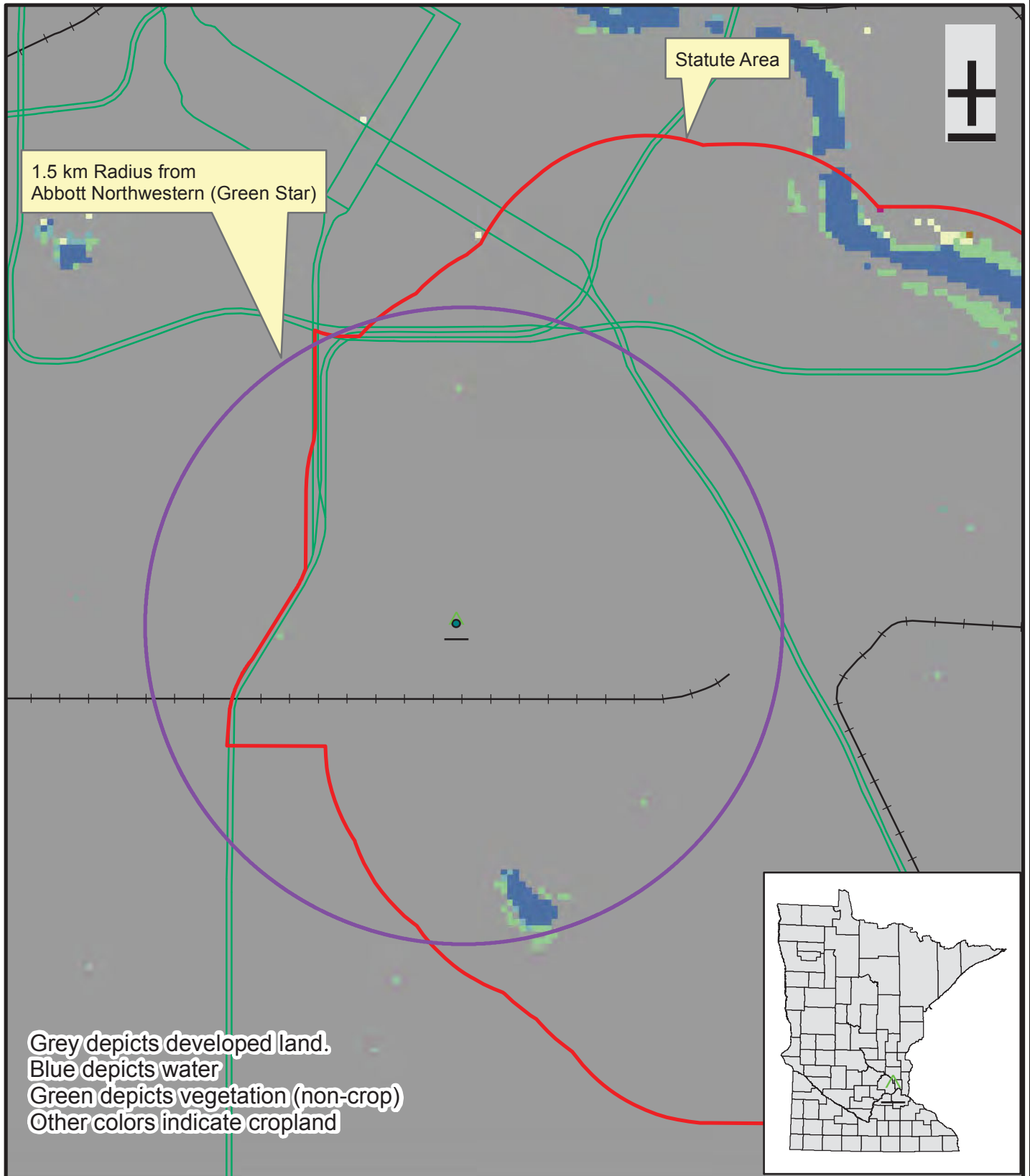
DATE	17 NOV 2011
DESIGN	RCB
GIS	RCB
CHECK	RCB
REVIEW	BAL

TITLE	GROUND ELEVATION	
PROJECT	Abbott Northwestern Hospital 800 28th Street East, Minneapolis, MN	
FIGURE:	A6	

PROJECT No. 103-81295

SCALE INDICATED

REV. 0



#### REFERENCE

Land use from National Agricultural Statistics Service (NASS), Cropland Layer, 2010

0 0.375 0.75 1.5 Kilometers



DATE	NOV 14, 2011
DESIGN	RCB
GIS	RCB

TITLE  
**LAND USE (NASS CROPLAND)  
WITHIN 1.5 KM**

PROJECT No. 103-81295

CHECK

PROJECT Abbott Northwestern Hospital  
800 28th Street East, Minneapolis, MN

SCALE As Indicated

REV. 0

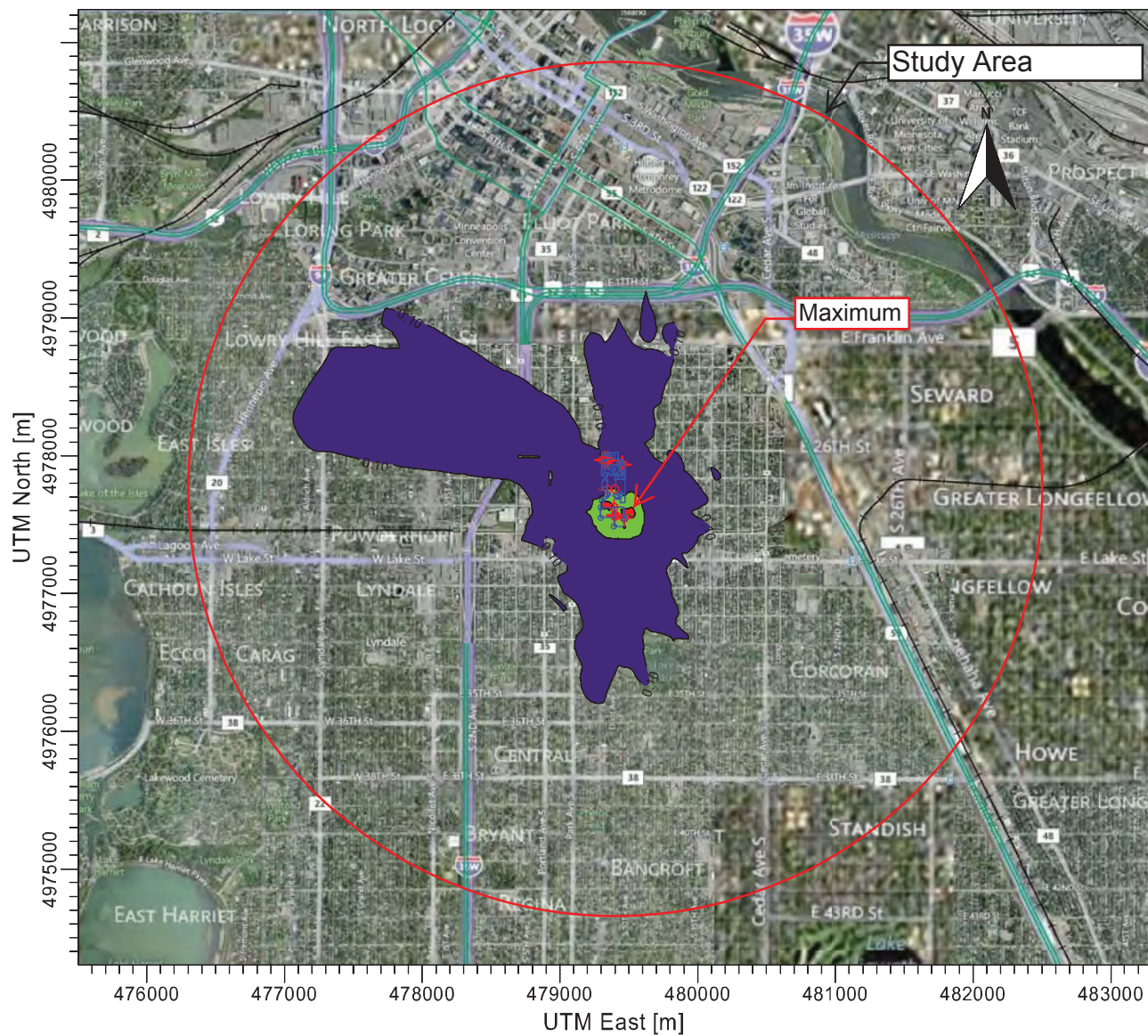
REVIEW

FIGURE: 7



PROJECT TITLE:



# **FIGURE A8** **Acute Hazard Index**



PLOT FILE OF HIGH 1ST HIGH 1-HR VALUES FOR SOURCE GROUP: ALL

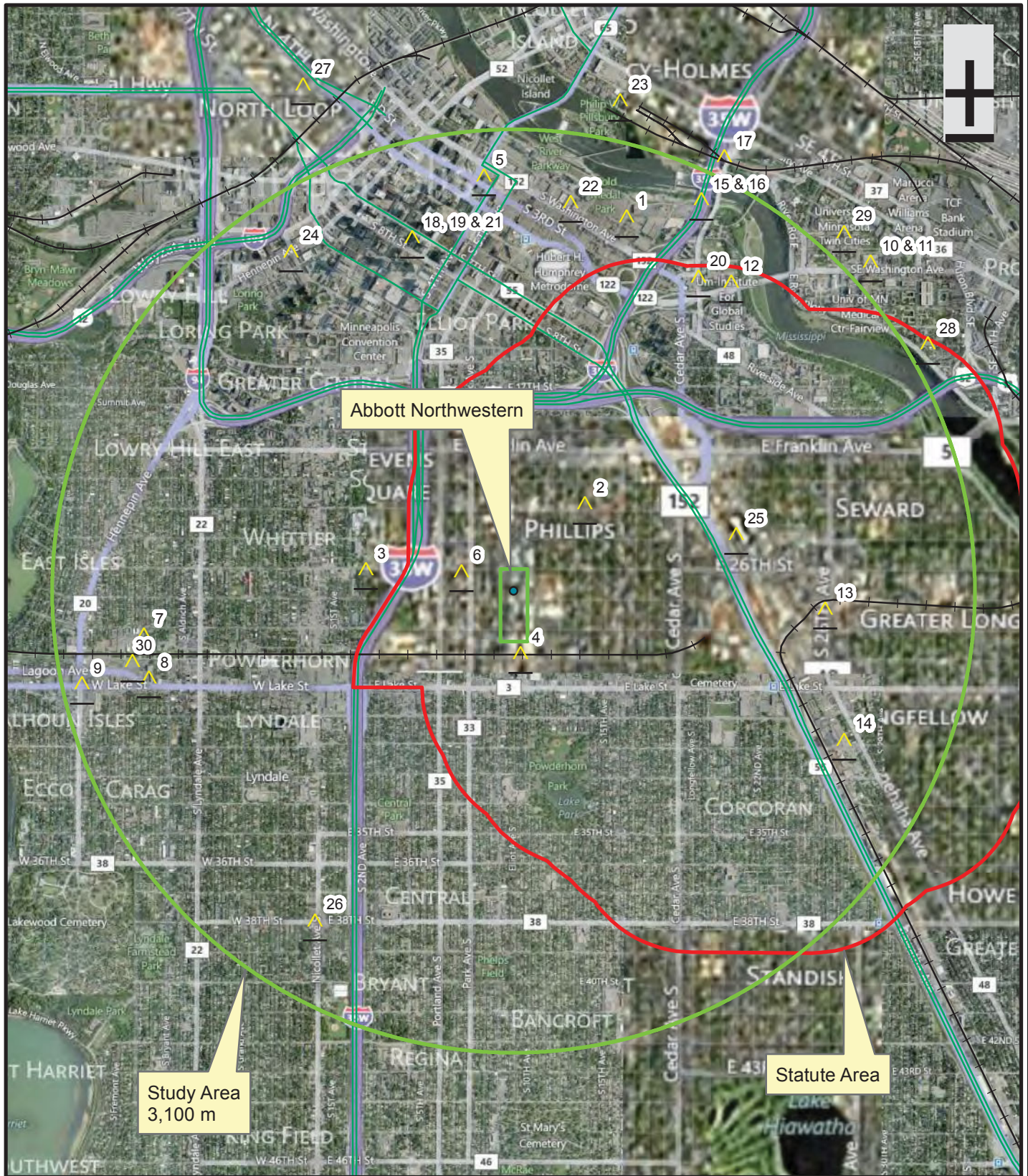
ug/m<sup>3</sup>



COMMENTS:  Datum: UTM NAD83 Zone 15N	SOURCES:  <b>22</b>	COMPANY NAME:  <b>Golder Associates Inc.</b>	
	RECEPTORS:  <b>10</b>	MODELER:  <b>Ryan Birkenholz, PE</b>	
	OUTPUT TYPE:  <b>Concentration</b>	SCALE:  1:48,856  0  1 km	
	MAX:  <b>0.58923 ug/m^3</b>	DATE:  <b>1/24/2012</b>	PROJECT NO.:  <b>103-81295</b>

FIGURES A9, A10, and A11 removed after discussions with the MPCA.





# REFERENCE

Background Image: ArcGIS Basemap Image

0 0.5 1 2 Kilometers



DATE	JAN 19, 2012
DESIGN	RCB
GIS	RCB
CHECK	
REVIEW	

TITLE	What's in my Neighborhood Locations	
PROJECT	Abbott Northwestern Hospital 800 28th Street East, Minneapolis, MN	

PROJECT No. 103-81295

SCALE As Indicated

REV. 0

FIGURE: A12

## APPENDIX B

### AERA Forms





# Minnesota Pollution Control Agency

520 Lafayette Road North  
St. Paul, MN 55155-4194

# AERA-01

## Deliverable Checklist Air Emissions Risk Analysis (AERA)

Doc Type: Air Emissions Risk Assessment – External Documentation

### Instructions on Page 5

**Purpose:** This form serves as a checklist for submitting all necessary AERA materials prior to submitting an air permit application (pre-app) or with an air permit application (post-app). This form also documents the Minnesota Pollution Control Agency (MPCA) AERA completeness review. ***MPCA staff will fill out areas in italics during their review, indicating deficiencies and advising the applicant on how they can be remedied.*** Instructions on how to fill out this form are at the end of the form. For more information on the AERA process see the “AERA Guidance” on the MPCA website at <http://www.pca.state.mn.us/ktqh42a>. All AERA documents must be submitted electronically whether submitted with an air permit application or alone. AERA documents submitted with an air permit application must also be submitted in hard copy. An AERA submitted with an air permit application is not considered “substantially complete” until **all** necessary quantitative and qualitative information has been submitted, and MPCA staff have determined that appropriate methods have been used. **Submitting AERA materials for review prior to submitting an air permit application is highly recommended** so that site specific suggestions from MPCA staff can be included in AERA materials submitted with an air permit application.

## Facility Information

1. AQ Facility ID No.: 05300061	2. SIC Code: 8602
3. Date(s) of pre-application submittal: 3/1/2012 (mm/dd/yyyy)	4. Date(s) of permit application submittal: 3/30/2012 (mm/dd/yyyy)
5. Facility name: Abbott Northwestern Hospital	
6. Facility location Street address: 800 28 <sup>th</sup> Street South	
City: Minneapolis	State: MN
Zip code: 55407	County: Hennepin
7. Proposer: Mr. Timothy B. Grote	Phone: 612-863-4164
E-mail: tim.grote@allina.com	
8. AERA Preparer: Mr. Ryan Birkenholz	Phone: 651-697-9737
E-mail: rbirkenholz@golder.com	

Are there differences between the AERA materials submitted pre-app and those submitted post-app? ☐ Yes ☐ No ☒ NA  
If yes, please explain the differences: The MPCA requested that the AERA must be submitted pre-app, so there is no post-app submittal.

**MPCA review question:** Are there differences between the AERA materials submitted pre-app and those submitted post-app?  
☐ Yes ☐ No ☐ NA If yes, please explain the differences:

## Summary of What the AERA Supports (Mark all that apply)

Is this a pre-application submittal? ☐ Yes ☒ No

- ☒ An air permit application.
- ☐ Compliance with an existing permit requirement.
- ☐ A mandatory Environmental Impact Statement (EIS), required by Minn. R. 4410.4400. Please indicate which subpart was met:
- ☐ A voluntary or discretionary EIS. If the AERA was requested by the MPCA, please indicate the request date (mm/dd/yyyy):
- ☐ A mandatory Environmental Assessment Worksheet (EAW), required by Minn. R. 4410.4300 subpart 15 (air emissions trigger) or subpart 5 (fuel conversion trigger).
- ☐ A mandatory Environmental Assessment Worksheet (EAW) required by a subpart of Minn. R. 4410.4300 other than 15 or 5. Please indicate which subpart was met:

If the AERA was requested by the MPCA please indicate the request date (mm/dd/yyyy):

- ☐ A voluntary or discretionary EAW. If the AERA was requested by the MPCA, please indicate the request date (mm/dd/yyyy):
- ☐ Pre-authorized change to a facility with a “flexible air permit”, where a facility owner is seeking to increase toxic emissions, which may be allowed to be changed without additional permitting.

☒ Other: Please explain: In support of MN Statute 116.07 Subd 4a

## MPCA Overall Summary of AERA Review

Names of MPCA AERA reviewer(s): \_\_\_\_\_

Submittal date (mm/dd/yyyy)	Pre-app review date (mm/dd/yyyy)	Overall pre-app AERA submittal determination (Select Yes for adequate, No for deficient, and enter reviewer's initials)	Post-app completeness review date (mm/dd/yyyy)	Overall post-app AERA submittal completeness determination (Select Yes for substantially complete, No for incomplete, and enter reviewer's initials)
		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____
		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____

**MPCA overall pre-app review notes including comments on deficiencies and how they can be remedied:**

**MPCA overall post-app review notes including comments on deficiencies and how they can be remedied:**

The proposer/AERA preparer should fill out the first three columns in the following tables. *In the italicized columns, MPCA staff will mark **pre-app sections** with “Yes” for adequate, “No” for deficient, and enter their initials; and will mark **post-app sections** with “Yes” for substantially complete, “No” for incomplete, and enter their initials.*

## Required AERA Forms

Submitted	Submittal date(s) (mm/dd/yyyy)	AERA forms are located at <a href="http://www.pca.state.mn.us/gp0r42f">http://www.pca.state.mn.us/gp0r42f</a>	Pre-app review date(s) (mm/dd/yyyy)	Pre-app adequacy	Post-app review date(s) (mm/dd/yyyy)	Post-app completeness
<input checked="" type="checkbox"/> Electronic <input type="checkbox"/> Hard copy	3/30/2012	<b>AERA-01</b> Deliverable Checklist (this form)		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____
<input checked="" type="checkbox"/> Electronic <input type="checkbox"/> Hard copy	3/30/2012	<b>AERA-02</b> Qualitative Information Checklist		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____
<input checked="" type="checkbox"/> Electronic <input type="checkbox"/> Hard copy	3/30/2012	<b>AERA-03</b> Air Dispersion Modeling Analysis Form		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____
<input checked="" type="checkbox"/> Electronic <input type="checkbox"/> Hard copy <input type="checkbox"/> NA	3/30/2012	<b>AERA-04</b> Emergency Internal Combustion Engine Certification (if applicable)		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____
<input checked="" type="checkbox"/> Electronic <input type="checkbox"/> Hard copy	3/30/2012	<b>AERA-05</b> Emissions Form		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____
<input type="checkbox"/> Electronic <input type="checkbox"/> Hard copy <input checked="" type="checkbox"/> NA		<b>AERA-13</b> Determination Checklist for Proposed Ethanol Facilities (if applicable)		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____
<input type="checkbox"/> Electronic <input type="checkbox"/> Hard copy <input checked="" type="checkbox"/> NA		<b>AERA-19</b> Cumulative Air Emissions Risk Analysis Form (NA only if no environmental review is being done)		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____
<input checked="" type="checkbox"/> Electronic <input type="checkbox"/> Hard copy	3/30/2012	<b>AERA-24</b> AERA Certification		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____
<input type="checkbox"/> Electronic <input type="checkbox"/> Hard copy <input checked="" type="checkbox"/> NA		<b>*AERA-26</b> Refined HHRAP-based Analysis Form (if applicable)		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____
<input type="checkbox"/> Electronic <input type="checkbox"/> Hard copy <input checked="" type="checkbox"/> NA		<b>*AERA-27</b> MPCA Mercury Risk Estimation Method (MMREM) Protocol Form (if applicable)		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____

\*\*For an AERA with a refined analysis based on EPA's Human Health Risk Assessment Protocol (HHRAP) or an analysis using the MPCA Mercury Risk Estimation Method (MMREM) a MPCA protocol (AERA-26 form or AERA-27 form) and the other forms must be submitted pre-app.

## Required Permit Forms

When the above AERA forms are submitted electronically please submit electronic versions of the following permitting forms with them.

Submitted	Submittal date(s) (mm/dd/yyyy)	Permit forms are located at <a href="http://www.pca.state.mn.us/s/nwqh472">http://www.pca.state.mn.us/s/nwqh472</a>	Pre-app review date(s) (mm/dd/yyyy)	Pre-app adequacy determination	Post-app review date(s) (mm/dd/yyyy)	Post-app completeness
<input checked="" type="checkbox"/> Electronic <input type="checkbox"/> Hard copy	3/30/2012	<b>GI-01:</b> Facility Information		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____
<input checked="" type="checkbox"/> Electronic <input type="checkbox"/> Hard copy	3/30/2012	<b>GI-02:</b> Process Flow Diagram		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____
<input checked="" type="checkbox"/> Electronic <input type="checkbox"/> Hard copy	3/30/2012	<b>GI-03:</b> Facility and Stack/Vent Diagram		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____
<input checked="" type="checkbox"/> Electronic <input type="checkbox"/> Hard copy	3/30/2012	<b>GI-04:</b> Stack/Vent Information		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____
<input type="checkbox"/> Electronic <input type="checkbox"/> Hard copy <input checked="" type="checkbox"/> NA		<b>GI-05D:</b> Fugitive Emission Source Information (if applicable)		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____
<input checked="" type="checkbox"/> Electronic <input type="checkbox"/> Hard copy	3/30/2012	<b>MI-01:</b> Building and Structure Information		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____
<input type="checkbox"/> Electronic <input type="checkbox"/> Hard copy <input checked="" type="checkbox"/> NA		<b>HG-01:</b> Mercury Releases to Ambient Air (NA if Hg PTE is less than 1 lb/year)		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____

## Required Supporting Submittals

### AERA emissions

Submitted	Submittal date(s) (mm/dd/yyyy)	An example spreadsheet is at <a href="http://www.pca.state.mn.us/index.php/view-document.html?gid=140">http://www.pca.state.mn.us/index.php/view-document.html?gid=140</a>	Pre-app review date(s) (mm/dd/yyyy)	Pre-app adequacy	Post-app review date(s) (mm/dd/yyyy)	Post-app completeness
<input checked="" type="checkbox"/> Electronic <input type="checkbox"/> Hard copy	3/30/2012	Emissions calculations in Excel spreadsheet named: _____		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____

### Mercury (Hg) submittals – ☒ NA - if facility mercury PTE emissions are less than 1 lb/yr

Submitted	Submittal date(s) (mm/dd/yyyy)	Mercury forms are at <a href="http://www.pca.state.mn.us/yhiz431">http://www.pca.state.mn.us/yhiz431</a>	Pre-app review date(s) (mm/dd/yyyy)	Pre-app adequacy	Post-app review date(s) (mm/dd/yyyy)	Post-app completeness
<input type="checkbox"/> Electronic <input type="checkbox"/> Hard copy		MMREM spreadsheet(s)		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____
<input type="checkbox"/> Electronic <input type="checkbox"/> Hard copy		Spreadsheet with fish tissue concentration calculations		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____
<input type="checkbox"/> Electronic <input type="checkbox"/> Hard copy		Spreadsheet or modeling file showing MMREM Hg air concentration calculations		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____

## AERA dispersion modeling

Submitted	Submittal date(s) (mm/dd/yyyy)	Dispersion modeling guidance is at <a href="http://www.pca.state.mn.us/jsr/i427">http://www.pca.state.mn.us/jsr/i427</a>	Pre-app review date(s) (mm/dd/yyyy)	Pre-app adequacy	Post-app review date(s) (mm/dd/yyyy)	Post-app completeness
<input checked="" type="checkbox"/> Electronic (optional) <input type="checkbox"/> Hard copy	3/30/2012	SAM spreadsheet (optional)		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____
<input checked="" type="checkbox"/> Electronic <input type="checkbox"/> Hard copy	3/30/2012	Base maps (e.g., aerial photos, digital raster graphs, CAD files, etc.)		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____
<input checked="" type="checkbox"/> Electronic <input type="checkbox"/> Hard copy	3/30/2012	Dispersion modeling input/output files and required support files (check all that apply)  <input type="checkbox"/> DISPERSE summary report and summary <input type="checkbox"/> AERMOD input/output files with unitized emission rates for RASS <input checked="" type="checkbox"/> AERMOD input/output files with Q/CHI <input type="checkbox"/> AERMOD input/output files for HHRAP based risk modeling		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____
<input checked="" type="checkbox"/> Electronic <input type="checkbox"/> Hard copy	3/30/2012	Map or Plot files (check all that apply)  <input type="checkbox"/> Showing the dispersion of unitized emissions from AERMOD for RASS <input checked="" type="checkbox"/> Showing Q/CHI risks from AERMOD <input type="checkbox"/> Showing rationale for HHRAP-based analysis receptor location <input type="checkbox"/> Showing HHRAP-based analysis risks		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____
<input checked="" type="checkbox"/> Electronic <input type="checkbox"/> Hard copy	3/30/2012	Remainder of files indicated on AERA-form 03 (e.g. meteorological data files, BPIP, AERMAP)		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____

## Required Supporting Risk Submittals

### Qualitative information

Submitted	Submittal date(s) (mm/dd/yyyy)	Documents	Pre-app review date(s) (mm/dd/yyyy)	Pre-app adequacy	Post-app review date(s) (mm/dd/yyyy)	Post-app completeness
<input checked="" type="checkbox"/> Electronic <input type="checkbox"/> Hard copy	3/30/2012	Maps indicated in AERA-form 02		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____
<input checked="" type="checkbox"/> Electronic <input type="checkbox"/> Hard copy	3/30/2012	Additional documents indicated in AERA-form 02		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____

☐ NA

### Risk results for the entire facility as proposed (check one)

Submitted	Submittal date(s) (mm/dd/yyyy)	RASS and Q/CHI spreadsheets are at <a href="http://www.pca.state.mn.us/zihy434">http://www.pca.state.mn.us/ zihy434</a>	Pre-app review date(s) (mm/dd/yyyy)	Pre-app adequacy	Post-app review date(s) (mm/dd/yyyy)	Post-app completeness
<input type="checkbox"/> Electronic <input type="checkbox"/> Hard copy		RASS spreadsheet(s) including all emitted chemicals		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____
<input type="checkbox"/> Electronic <input type="checkbox"/> Hard copy		Q/CHI spreadsheet including all emitted chemicals		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____
<input type="checkbox"/> Electronic <input type="checkbox"/> Hard copy		HHRAP-based analysis files that include all emitted chemicals		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____
<input checked="" type="checkbox"/> Electronic <input type="checkbox"/> Hard copy	3/30/2012	Q/CHI spreadsheet with select chemicals and a RASS that includes chemicals screened out		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____
<input type="checkbox"/> Electronic <input type="checkbox"/> Hard copy		HHRAP-based analysis files with select chemicals and a RASS that includes chemicals screened out		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____

### Risk results for entire pre-existing facility (check one)

Submitted	Submittal date(s) (mm/dd/yyyy)	RASS and Q/CHI spreadsheets are at <a href="http://www.pca.state.mn.us/zihy434">http://www.pca.state.mn.us/ zihy434</a>	Pre-app review date(s) (mm/dd/yyyy)	Pre-app adequacy	Post-app review date(s) (mm/dd/yyyy)	Post-app completeness
<input type="checkbox"/> Electronic <input type="checkbox"/> Hard copy		RASS spreadsheet(s) including all emitted chemicals		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____
<input type="checkbox"/> Electronic <input type="checkbox"/> Hard copy		Q/CHI spreadsheet including all emitted chemicals		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____
<input type="checkbox"/> Electronic <input type="checkbox"/> Hard copy		HHRAP-based analysis, files that include all emitted chemicals.		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____
<input checked="" type="checkbox"/> Electronic <input type="checkbox"/> Hard copy	3/30/2012	Q/CHI spreadsheet with select chemicals and a RASS that includes chemicals screened out		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____
<input type="checkbox"/> Electronic <input type="checkbox"/> Hard copy		HHRAP-based analysis files with select chemicals and a RASS that includes chemicals screened out		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____

### Additional Information

In the table below, please describe any additional attachments

Attachment reference number (or other identifier)	Title	Purpose/Description

### Proposer/Preparer Instructions

Boxes can be checked by clicking on them. Response areas will expand as necessary to include the complete response. Multiple dates can be added by using the “Enter key” (return key) after you type the first date. All Air Emission Risk Analysis (AERA) documents must be submitted electronically whether submitted with an air permit application or alone. AERA documents submitted with an air permit application must also be submitted in a hard copy. Hard copies of spreadsheets, like the Risk Assessment Screening Spreadsheet (RASS) and lengthy modeling files should include the first summary page of the document but do not need to include subsequent pages since the electronic version will be available for review.

If **all** of the requested forms and support documents **are not included** with an air permit application needing an AERA the air permit application **will be deemed incomplete**. This includes risk estimates for pre-existing facilities. MPCA staff will return this AERA form plus any other incomplete AERA forms to the applicant with deficiencies and remedies indicated in the *italicized* MPCA review areas. If forms were submitted pre-app they should be updated and re-submitted post-app with any *italicized* MPCA comments left in and changes summarized in the appropriate areas.

**Facility information:** Fill in the Air Quality (AQ) Facility identification (ID) No. (Number), which is the first eight digits of the permit number for all new permits issued under the new operating permit program, Standard Industrial Classification (SIC) code, facility name and location, and submittal dates. The project proposer and AERA preparer should be people that MPCA staff can contact with general and technical questions about the AERA submittal.

**AERA forms:** Instructions accompany each of the AERA forms. Contact MPCA for further clarification.

**MPCA air permit forms:** Instructions for completing these forms may be found on MPCA’s website. Contact the MPCA for further clarification.

**Additional information:** These forms are designed to include all of the essential information for an AERA, replacing the need for a separate report. If the applicant feels that additional information is necessary to further describe the facility, the processes, the method of generating emissions estimates, the assumptions used in generating dispersion factors or risk estimates, etc. this information can be attached to the AERA forms with the reference, title, and purpose/description indicated in the additional information section of this form.

## ***MPCA Review Instructions***

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### ***Specific forms/support documents***

*MPCA staff will summarize their review of specific forms/support documents by marking either “Yes” for adequate or “No” for deficient in the pre-app sections, or “Yes” for substantially complete or “No” for incomplete in the post-app sections, along with their initials. They will add comments on deficiencies and how they can be remedied in the summary section. When there are multiple submittals, include each new submittal date in the table with the corresponding review dates and comments, thus keeping a log of submittals.*

### ***Overall adequacy/completeness summary***

*This form should summarize the results of the reviews conducted in other sections and on other forms. If **all** of the necessary forms/documents are present and follow the appropriate methods (i.e., follows the AERA, emissions and modeling guidance) MPCA staff will mark the appropriate overall summary section with either “Yes” for adequate in the pre-app section, or “Yes” for substantially complete in the post-app section. Otherwise they will mark “No” for deficient in the pre-app AERA submittal determination section or “No” for incomplete in the post-app AERA determination section. They will add comments on deficiencies and how they can be remedied in the overall summary section. If this form is being submitted as a protocol indicate in the MPCA overall review notes whether the protocol is approved or has deficiencies. Remember an AERA submitted with an air permit application is not considered “substantially complete” until **all** necessary quantitative and qualitative information has been submitted, **and MPCA staff have determined that appropriate methods have been used**. Post-app results from this form and any other forms showing deficiencies should be shared with the permit engineer conducting the permit application completeness review who will then share it with the applicant.*





# Minnesota Pollution Control Agency

520 Lafayette Road North  
St. Paul, MN 55155-4194

# AERA-02

## Qualitative Information Checklist Air Emissions Risk Analysis (AERA)

Doc Type: Air Emissions Risk Assessment – External Documentation

### Instructions on AERA Form 02b

**Purpose:** This form serves as a checklist for submitting all necessary qualitative AERA materials prior to submitting an air permit application (pre-app) or with an air permit application (post-app). This form also documents the Minnesota Pollution Control Agency (MPCA) AERA qualitative review. ***MPCA staff will fill out areas in italics during their review, indicating deficiencies and advising the applicant on how they can be remedied.*** Instructions on how to fill out this form and example maps are in the AERA-02b form. For more information on the AERA process, see the “AERA Guidance” on the MPCA website at <http://www.pca.state.mn.us/ktqh42a>. An AERA submitted with an air permit application is not considered “substantially complete” until all necessary quantitative and qualitative information has been submitted and MPCA staff have determined that appropriate methods have been used. **Submitting AERA materials for review prior to submitting an air permit application is highly recommended** so that site specific suggestions from MPCA staff can be included in AERA materials submitted with an air permit application.

### Facility Information

- AQ Facility ID No.: 05300061
- SIC Code: 8602
- Date(s) of pre-application submittal: \_\_\_\_\_  
(mm/dd/yyyy)
- Date(s) of permit application submittal: 3/30/2012  
(mm/dd/yyyy)
- Facility name: Abbott Northwestern Hospital
- Facility location  
Street address: 800 28<sup>th</sup> Street South  
City: Minneapolis State: MN Zip code: 55407 County: Hennepin
- Proposer: Mr. Timothy B. Grote Phone: 612-863-4164 E-mail: tim.grote@allina.com
- AERA Preparer: Mr. Ryan Birkenholz Phone: 651-697-9737 E-mail: rbirkenholz@golder.com

Are there differences between the qualitative AERA materials submitted pre-app and those submitted post-app?

☒ Yes ☐ No ☐ NA If yes, please explain the differences: MPCA comments incorporated into

**MPCA Review Question:** Are there differences between the qualitative AERA materials submitted pre-app and those submitted post-app? ☐ Yes ☐ No ☐ NA If yes, please explain the differences:

### MPCA Overall Summary of Qualitative AERA Review

Names of MPCA AERA reviewer(s): \_\_\_\_\_

Submittal date (mm/dd/yyyy)	Pre-app review date (mm/dd/yyyy)	Overall pre-app qualitative determination (Select Yes for adequate, No for deficient, and enter reviewer's initials)	Post-app completeness review date (mm/dd/yyyy)	Overall post-app qualitative completeness determination (Select Yes for substantially complete, No for incomplete, and enter reviewer's initials)	**Technical accuracy review date (mm/dd/yyyy)	**Technical accuracy determination and reviewer's initials
		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____
		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____

**MPCA overall pre-app qualitative AERA review notes including comments on deficiencies and how they can be remedied:**

**MPCA overall post-app qualitative AERA review notes including comments on deficiencies and how they can be remedied:**

**\*\*MPCA overall qualitative AERA technical accuracy review notes including comments on deficiencies and how they can be remedied:**

## Project Description

Please describe existing conditions, proposed facility changes, and any past AERA, permitting or environmental review. Include information about types of air permits, types of environmental review and other pertinent information.

Abbott Northwestern currently operates under MPCA state operating permit number 05300061-001. Abbott requests to discontinue the ability to combust number 6 fuel oil in GP001 boilers and replace it with the ability to combust number 2 fuel oil. This change will result in a net decrease of potential emissions from GP001 boilers. Abbott is also incorporating insignificant modifications with this permit action.

Has the facility had past compliance issues, complaints or community concerns? ☒ Yes ☐ No

If yes, please summarize:

Particulate matter dispersion modeling was not completed as per the air permit as identified in a November 28, 2008 letter. Abbott submitted the required dispersion modeling in April 2009, which showed compliance with the ambient air quality standards.

## Maps

Maps provide a pictorial representation of information and allow for significant abbreviation of text submittals. **Each of the following required maps should be standardized with a title, reference, date, legend, scale north arrow, and appropriate radius.** Additional information can be added to clarify the maps or facility surroundings. A site visit is recommended to verify information.

What is the minimum stack height modeled? 6.1 meters

What is the maximum stack height modeled? 30.5 meters

### Sensitive receptors:

- ☒ Provide a map with the appropriate radius (see below, instructions in form AERA-02b and AERA guidance) around the facility and surrounding area with the following features: facility, nearby residents, schools, daycares, public recreation areas (e.g., playgrounds, swimming pools, tennis courts, city parks, etc.), nursing homes, hospitals, and other locations where sensitive receptors congregate.

Stack height less than 50 meters: 1.5 kilometers (approximately one mile) radius

Stack height between 50 and 100 meters: 3 kilometers (approximately two miles) radius

Stack height greater than 100 meters: 10 kilometers (approximately six miles) radius

- ☒ How close are the nearest residents? 40 meters

### General neighborhood information:

- ☒ What is the population density surrounding the facility? 8967 persons/square mile
- ☐ Provide a map of census and demographic information, such as population density if there is considerable variation within the appropriate radius (see sensitive receptor map criteria above).
- ☒ Additional information about the surrounding community: The area around the facility is composed of a mix of commercial, industrial and residential areas. There is an elementary school adjacent to the facility to the east.
- ☒ Is the facility located in an area described by Minn. Stat. §116.07, subd. 4a? ☒ Yes ☐ No

Check the map of South Minneapolis at (<http://www.pca.state.mn.us/index.php/view-document.html?gid=14029>) to determine if the facility is in the described area. If yes, contact a MPCA supervisor or manager for a pre-app meeting/call.

### Nearby permitted air emission facilities:

Provide a map and/or list below, of the permitted air emission facilities and following information, within the proper radius (below) of the facility.

List of nearby permitted air emission facilities within...

Stack height less than 50 meters: 1.5 kilometers (approximately one mile) radius  
 Stack height between 50 and 100 meters: 3 kilometers (approximately two miles) radius  
 Stack height greater than 100 meters: 10 kilometers (approximately six miles) radius

Nearby facility name	Type of permit (registration, state, Title V)	Approximate distance from project to nearby facility	Reference
Smith Foundry	Registration	1270 meters SE	MPCA EDA
Wells Fargo Home Mortgage	Registration	700 meters NW	MPCA EDA
Bituminous Roadway Inc.	Registration	1160 meters SE	MPCA EDA
Nico Plating Co.	Title V	1300 meters SW	MPCA EDA
Note: The following facilities appear in the database but have inactive air permits: City of Minneapolis Asphalt and Cement Plants and Rahr Malting Co.			

### Zoning:

- ☒ Provide a zoning map of the area within ten kilometers of the facility. Supplemental maps with relevant ordinances informing potential exposures (e.g. raising chickens in town or prohibitions of livestock, etc.) may be helpful. If this information is not provided, the MPCA cannot make assumptions regarding zoning restrictions. If land is not zoned and ordinances are not available, a detailed land use map is sufficient.

or

- ☒ Describe zoning within ten kilometers of the facility, if a zoning map is not available: The zoning within ten kilometers of this facility includes residential, commercial, and industrial uses. It includes all of downtown Minneapolis, Lake Calhoun, Lake of the Isles, part of lake Harriet, and part of the Mississippi River. The City of Minneapolis has ordinances that restrict the raising of livestock or poultry, therefore it is unlikely that this activity takes place within ten kilometers.

### Land use:

- ☒ Provide a map showing current land use within ten kilometers of the facility. Land use maps include information such as areas of residential, commercial, and industrial use, farms, forests and waterways. If no map is provided, the most restrictive land use will be assumed. It is also helpful to know if the land is used for other purposes than those designated on the land use maps. If farms are currently located within ten kilometers of the facility, indicate what type of farming occurs (e.g. beef farming, dairy cows, chickens, urban gardening). The MPCA considers "reasonable potential future land use." According to U.S. Environmental Protection Agency's (EPA) Human Health Risk Assessment Protocol for Hazardous Waste Combustion Facilities (HHRAP), three examples of reasonable potential future land use are:

- Rural area characterized as undeveloped open fields could reasonably be expected to become farmland if it can support agricultural activities.
- Rural area currently characterized by open fields and intermittent housing could reasonably be expected to become a residential subdivision.
- An area currently characterized as an industrial area would **not** reasonably be expected to become farmland.

### Risk receptor information and isopleths:

- ☐ No risk isopleth map was included because neither an Emission Rate/Chemical Health Index (Q/CHI) nor a receptor grid-based HHRAP-type analysis was done.
- ☒ If conducting a more refined analysis such as the Q/CHI analysis or HHRAP-based analysis, provide a map showing risk isopleths for each exposure scenario assessed. Locations of all receptors for whom risks are estimated should be indicated on the map, including the maximum acute (hourly) receptor and the maximum chronic (annual).
- ☐ If additional risk receptor scenario(s) were included please explain them and how they were chosen:

### Persistent Bioaccumulative Toxic chemicals (PBTs)

Facilities emitting PBTs should provide a map showing the following features:

- ☐ No PBTs are emitted thus none of the following maps were provided.

☒ Fishable water bodies

A water body may be considered “fishable” if it typically contains water year-round in a year that receives at least 75 percent of the normal annual precipitation for that area. Provide a map showing lakes, rivers and streams within the following appropriate radius depending on the stack height. For facilities with stack heights less than 100 meters, a map should be provided showing lakes, rivers and streams within a 3 km radius (approximately 2 miles). For facilities with stack heights greater than 100 meters, show lakes, rivers and streams for the area within a 10 km radius (6 miles). Also, show water bodies outside the specified area that may be fed by rivers and streams lying within the radius of interest. It is also useful to know if the water body has public access.

- ☐ No fishable water bodies are within the appropriate radius thus no map was provided. If water bodies are present within the appropriate radius, please explain why they would not be considered fishable:

☒ Farming locations

While land use maps provide the MPCA with general information, it is recognized that agricultural land use does not equate to actually having farms present. Provide a map showing the specific locations of farms within the specified area.

Stack height less than 50 meters:	1.5 kilometers (approximately one mile)
Stack height between 50 and 100 meters:	3 kilometers (approximately two miles)
Stack height greater than 100 meters:	10 kilometers (approximately six miles)

If no information is available regarding land use, the default assumption will be that a farmer could be impacted by facility emissions, and the farmer's risks will be used as a basis for decisions. If land use indicates that farms do not exist within the appropriate radius, only resident risks will be assessed. Resident exposures could include ingesting chickens, eggs, or other livestock that are raised on the property if allowed by ordinances. Additional exposure guidance is provided in the instructions provided in Form 2b.

When available, provide additional information about farms surrounding the facility. For example:

- ☐ What crops are grown on the farm?
- ☐ What animals are raised?
- ☐ Is it a small family farm?
- ☐ Is it a large commercial farm?
- ☒ No farms are within the appropriate radius thus no map was provided.

## Exposure Information

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1. Is there a fence surrounding the facility? ☐ Yes ☒ No
2. Is access to the property restricted? ☐ Yes ☒ No  
Describe: This is a campus setting. There is no ambient air boundary.
3. Does the facility rent or lease portions of property for farming or other purposes that could provide exposure to public? ☐ Yes ☒ No  
If yes, describe:
4. Is there a fishable water body on farming property? ☐ Yes ☒ No
5. Describe access to the water bodies (within appropriate radius)? ☒ Public ☐ Private property  
Describe: There are three fishable water bodies within 3 km of the Facility, Powderhorn Lake, Loring Lake, and the Mississippi River. All three have public access.
6. Is it possible for emissions from diesel trucks idling on the facility property to be equivalent or greater than 2 or more trucks idling continuously for an hour or longer? ☒ Yes ☐ No

If yes please briefly describe the conditions under which trucks idle on the property, the maximum number of trucks expected to be idling on the property at the same time, for how long, and approximate distance to the maximally impacted receptor. Also, describe any proposed diesel emission reduction steps, such as steps described in an idling prevention plan or the use of retrofitted equipment. A “yes” response serves as a prompt for further consideration but does not automatically imply the need for further quantitative analysis.

It is unlikely this would happen, but if the ambient temperature were low enough and there are numerous deliveries taking place at the same time, it is possible for more than 2 trucks to be idling on property for more than 1 hour.  
Describe: than 1 hour.

Please describe any additional site specific uncertainties related to the emissions, dispersion modeling, toxicity benchmarks or exposure assumptions used in the AERA:

The hospital itself is not exempt from the Minneapolis anti-idling ordinance, but there are scenarios when delivery trucks would be exempt. One is described in #6 above.

Please describe any additional analysis (e.g. a mineral fibers analysis) performed beyond what is described in the guidance:

## Quick Reference Table (See AERA-02b Instructions for additional information)

Qualitative section	What to include	Resources
<b>Receptors and sensitive populations</b>	Schools, daycares, recreation centers/playgrounds, nursing homes, hospitals, and residence locations	Aerial photos from sites referenced above or local records, databases.
<b>General neighborhood information</b>	Population and nearest residents if not addressed under Receptors and Sensitive Populations.	U.S. Census Bureau: <a href="http://www.census.gov/">http://www.census.gov/</a> Minnesota Census Quick Facts: <a href="http://quickfacts.census.gov/qfd/maps/minnesota_map.html">http://quickfacts.census.gov/qfd/maps/minnesota_map.html</a> and <a href="http://www.census.gov/census2000/states/mn.html">http://www.census.gov/census2000/states/mn.html</a>
<b>Nearby facilities</b>	Map and/or list of permitted facilities with air emissions; not limited to facilities with air permits	Minnesota Environmental Data Access: <a href="http://www.pca.state.mn.us/data/edaAir/">http://www.pca.state.mn.us/data/edaAir/</a> What's In My Neighborhood?: <a href="http://www.pca.state.mn.us/backyard/neighborhood.html">http://www.pca.state.mn.us/backyard/neighborhood.html</a>
<b>Zoning</b>	Description of zoning within a 10 km radius where available	Zoning maps are searchable on the internet for most counties in Minnesota – use your preferred search engine to find “MN zoning maps”
<b>Land use</b>	Provide map showing land use within a 10 km radius including farming, forests, residential and industrial areas. It is recommended to verify information with a site visit.	Minnesota County Land Use Maps: <a href="http://www.mnplan.state.mn.us/maps/LandUse/">http://www.mnplan.state.mn.us/maps/LandUse/</a> Minnesota Land Use and Cover: <a href="http://www.mngeo.state.mn.us/landuse/">http://www.mngeo.state.mn.us/landuse/</a>
<b>Risk receptor information and isopleths</b>	Maps can be generated using AERMOD when using the Q/CHI methodology. Maps can be produced for each exposure time and scenario, e.g. acute inhalation, by overlaying the risk isopleths with an aerial photograph of the area.	AERMOD software <a href="http://www.lakes-environmental.com/ISCAERMOD/ISCAERFeatures.html">http://www.lakes-environmental.com/ISCAERMOD/ISCAERFeatures.html</a>  Aerial photographs obtained from either the Agency or other GIS-based source.
<b>Fishable water bodies</b>	Provide map with labels of fishable water bodies. Information on accessibility to water body should be provided when available.	Lake Finder: <a href="http://www.dnr.state.mn.us/lakefind/index.html">http://www.dnr.state.mn.us/lakefind/index.html</a>
<b>Farming locations</b>	Provide map showing farming locations surrounding facility. Additional information regarding crop types, animals raised, number of animals, farm size, and other qualitative information about the farm may be provided.	Minnesota County Land Use Maps: <a href="http://www.mnplan.state.mn.us/maps/LandUse/">http://www.mnplan.state.mn.us/maps/LandUse/</a>

## MPCA Review Instructions

### Specific section/document review

MPCA staff will summarize their review of specific sections/support documents by marking either “Yes” for adequate or “No” for deficient in the pre-app sections, or “Yes” for substantially complete or “No” for incomplete in the post-app sections, along with their initials. They will add comments on deficiencies and how they can be remedied in the summary section. When there are multiple submittals, include each new submittal date in the table with the corresponding review dates and comments, thus keeping a log of submittals.

### Overall adequacy/completeness summary

If **all** of the necessary sections/documents are present and follow the appropriate methods (i.e., follows the AERA, emissions and modeling guidance) MPCA staff will mark the appropriate overall summary section with either “Yes” for adequate in the pre-app section, or “Yes” for substantially complete in the post-app section. Otherwise they will mark “No” for deficient in the pre-app AERA

submittal determination section or “No” for incomplete in the post-app AERA determination section. They will add comments on deficiencies and how they can be remedied in the overall summary section. Remember an AERA submitted with an air permit application is not considered “substantially complete” until **all** necessary quantitative and qualitative information has been submitted, and MPCA staff have determined that appropriate methods have been used. **Please summarize these results in the AERA-01 form.** The AERA-01 form will be shared with the permit engineer conducting the permit application completeness review. If deficiencies are noted in this form during the completeness review then this form should also be shared with the permit engineer who will share it with the applicant.

### MPCA qualitative review summary

Submittal date(s) (mm/dd/yyyy)	Pre-app review date(s) (mm/dd/yyyy)	Pre-app adequacy	Post-app completeness review date(s) (mm/dd/yyyy)	Post-app completeness	Technical accuracy review date(s) (mm/dd/yyyy)	Technical accuracy	Information
		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____	Project description
		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____	Summary of compliance, complaints, and/or community concerns
		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____	Sensitive receptors map and nearby residences
		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____	Census data/population density map or information
		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____	Determination on whether the facility is subject to Minn. Stat. 116.07, Subd4a (the Phillips neighborhood)

Submittal date(s) (mm/dd/yyyy)	Pre-app review date(s) (mm/dd/yyyy)	Pre-app adequacy	Post-app completeness review date(s) (mm/dd/yyyy)	Post-app completeness	Technical accuracy review date(s) (mm/dd/yyyy)	Technical accuracy	Information
		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____	Map or list of permitted air emission facilities at proper radius
		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____	Map or description of zoning within 10km of the facility
		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____	Map showing current land use within 10km
		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____	Risk receptor information and isopleth maps if applicable (check NA only if a RASS was used)
		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____	Map of fishable water bodies
		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____	Map of farming locations
		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____	Exposure information
		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____	Description of additional site specific uncertainty or additional analysis

### MPCA qualitative review questions:

Is all the necessary information present? ☐ Yes ☐ No

Based on the modeled stack heights, do the maps show the appropriate radius? ☐ Yes ☐ No

Did they follow the guidance in presenting this information? ☐ Yes ☐ No

Is the information correct? ☐ Yes ☐ No

☐ Yes, a site visit was conducted by the following MPCA staff on (mm/dd/yyyy): \_\_\_\_\_

### MPCA qualitative review notes:





# Minnesota Pollution Control Agency

520 Lafayette Road North  
St. Paul, MN 55155-4194

# AERA-03

## Air Dispersion Modeling Analysis Form to Support Air Emissions Risk Analysis (AERA)

Doc Type: Air Emissions Risk Assessment – External Documentation

### Instructions on Page 10

**Purpose:** This form describes the modeling assumptions and methods that will be/were used in an AERA submitted prior to submitting an air permit application (pre-app) or with an air permit application (post-app). It can function as a protocol, submittal checklist and Minnesota Pollution Control Agency (MPCA) review document. There are different forms for criteria pollutant modeling. **MPCA staff will fill out areas in italics during their review, indicating deficiencies and advising the applicant on how they can be remedied.** Instructions on how to fill out this form are at the end of the form. Please consult the AERA guidance at <http://www.pca.state.mn.us/index.php/view-document.html?gid=146> and modeling guidance at <http://www.pca.state.mn.us/nwqh421> for instructions on modeling for an AERA. An AERA submitted with an air permit application is not considered “substantially complete” until **all** necessary quantitative and qualitative information has been submitted and MPCA staff have determined the appropriate methods have been used. **Submitting AERA materials for review prior to submitting an air permit application is highly recommended** so that site specific suggestions from MPCA staff can be included in AERA materials submitted with an air permit application.

### Facility Information

1. AQ Facility ID No.: <u>05300061</u>	2. Three-letter modeling facility ID (ex., ACE): <u>ANW</u>
3. Date(s) of pre-application submittal: _____ (mm/dd/yyyy)	4. Date(s) of permit application submittal: <u>3/30/2012</u> (mm/dd/yyyy)
5. Facility name: <u>Abbott Northwestern Hospital</u>	
6. Facility location Street address: <u>800 28<sup>th</sup> Street South</u> City: <u>Minneapolis</u> State: <u>MN</u> Zip code: <u>55413</u> County: <u>Hennepin</u>	
7. Proposer: <u>Mr. Timothy B. Grote</u>	Phone: <u>612-863-4164</u> E-mail: <u>tim.grote@allina.com</u>
8. AERA Preparer: <u>Mr. Ryan Birkenholz</u>	Phone: <u>651-697-9737</u> E-mail: <u>rbirkenholz@golder.com</u>

Are there differences between the AERA air dispersion modeling materials submitted pre-app and those submitted post-app? ☒ Yes ☐ No ☐ NA

If yes, please explain the differences:

Emission rates changed for two generators <600 bhp. Modeling redone.

**MPCA review question:** Are there differences between the AERA air dispersion modeling materials submitted pre-app and those submitted post-app? ☐ Yes ☐ No ☐ NA

If yes, please explain the differences:

### MPCA Summary of Overall AERA Air Dispersion Modeling Review

Names of MPCA AERA reviewers: \_\_\_\_\_

Submittal date (mm/dd/yyyy)	Pre-app review date (mm/dd/yyyy)	Overall pre-app AERA air dispersion modeling determination (Select Yes for adequate, No for deficient, and enter reviewer's initials)	Post-app completeness review date (mm/dd/yyyy)	Overall post-app AERA air dispersion modeling completeness determination (Select Yes for substantially complete, No for incomplete, and enter reviewer's initials)	**Technical accuracy review date (mm/dd/yyyy)	*Technical accuracy determination and reviewer's initials
		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____
		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____

### MPCA overall AERA air dispersion modeling review questions:

Are differences in methodologies between the approved protocol and modeled results acceptable? ☐ Yes ☐ No

Why:

**MPCA overall AERA air dispersion modeling pre-app review notes including comments on deficiencies and how they can be remedied:**

**MPCA overall AERA air dispersion modeling post-app review notes including comments on deficiencies and how they can be remedied:**

**\*\*MPCA overall AERA air dispersion modeling technical accuracy review notes including comments on deficiencies and how they can be remedied:**

## General Information

This form is being submitted: <b>(mark the box that is relevant to the current submittal but keep dates of other submittals in the chart as a log)</b>	Submittal date(s) (mm/dd/yyyy)
<input type="checkbox"/> As part of a HHRAP-based analysis protocol (AERA-26)	
<input type="checkbox"/> As a non-HHRAP-based analysis protocol	
<input checked="" type="checkbox"/> To explain results in a pre-app submittal*	3/1/2012
<input type="checkbox"/> To explain results in an air permit application*	
*If applicable, please explain any differences in methodologies between the approved protocol and the modeled results:	

### Please select all of the modeling methods that will be/were used.

- ☐ RASS "look-up" table dispersion factors
- ☐ DISPERSE (Dispersion Information Screening Procedures for Emission Risk Screening Evaluations)
- ☐ AERMOD to generate dispersion factors for the RASS (using 1 g/sec emission rates)
- ☐ AERMOD to generate individual pollutant concentrations for the RASS
- ☒ AERMOD to generate risk estimates by modeling Q/CHI sums instead of emission rates
- ☐ AERMOD to conduct deposition modeling for input into a HHRAP-based analysis (e.g., IRAP)
- ☐ AERMOD to generate unitized dispersion factors for MMREM
- ☐ AERMOD to generate mercury air concentrations for MMREM
- ☐ Other (explain): \_\_\_\_\_

### Please indicate why the specified modeling method was selected.

- ☐ AERMOD modeling will **not** be/was **not** done because:
  - ☐ RASS lookup tables showed results below risk guidelines
  - ☐ DISPERSE modeling showed results below risk guidelines
- ☐ AERMOD modeling will be/was done after conservative screening modeling results were submitted
- ☒ AERMOD modeling will be/was done without submitting conservative screening modeling results
- ☐ Other (explain): \_\_\_\_\_

**Please indicate what support documents are being submitted.** If this form is being submitted as a protocol, please include at least one sample of each of the appropriate files listed below. A sample represents the framework of how the model will generally be set up and may not include, for example, facility specific source inputs. If this form is being submitted to describe results, please submit all of the following files which were used in the analysis:

- |  |  |
|--|--|
| AERMOD input:  | <input type="checkbox"/> sample <input checked="" type="checkbox"/> complete set (*.inp, *.adi, *.ami)         |
| (Input file should include buildings and receptor grid(s)) |  |
| AERMOD output:   | <input type="checkbox"/> sample <input checked="" type="checkbox"/> complete set (*.ado, *.plt)                |
| BPIP-PRIME Input files:                                    | <input type="checkbox"/> sample <input checked="" type="checkbox"/> complete set (*.bpi)                       |
| AERMAP files:  | <input type="checkbox"/> sample <input checked="" type="checkbox"/> complete set (*.dem(s), *.tif [NED files]) |
| Meteorological files:                                      | <input type="checkbox"/> sample <input checked="" type="checkbox"/> complete set (*.pfl, *.sfc)                |
| Q/CHI plot files if using Q/CHI method:                    | <input type="checkbox"/> sample <input checked="" type="checkbox"/> complete set                               |
| Modeled emissions file/s                                   | <input type="checkbox"/> sample <input checked="" type="checkbox"/> complete set (*.txt, *.xls)                |
| Other:   | <input type="checkbox"/> sample <input type="checkbox"/> complete set  |



**How were the above supporting files (AERMOD, BPIP-PRIME, AERMAP files) submitted?**

- ☐ CD-ROM included with AERA submittal  
☐ SAMS spreadsheet (indicate name of file): \_\_\_\_\_  
☐ E-mailed separately  
☒ Uploaded to an FTP site  
☐ Other (explain): \_\_\_\_\_

**Please note any additional information for the General Summary section (e.g., hourly and annual modeling was conducted differently).**

Emission rates for emergency generators are modeled at 0 g/s as allowed by MPCA guidance.

**MPCA general information review summary**

<b>Submittal date(s)</b> (mm/dd/yyyy)	<b>Pre-app review date(s)</b> (mm/dd/yyyy)	<b>Pre-app adequacy</b>	<b>Post-app completeness review date(s)</b> (mm/dd/yyyy)	<b>Post-app completeness</b>	<b>Technical accuracy review date(s)</b> (mm/dd/yyyy)	<b>Technical accuracy</b>
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**Detailed Modeling Descriptions****1. Criteria pollutant modeling summary:** Please identify how the Criteria Pollutants will be/were modeled.

- ☒ NAAQS/MAAQs air dispersion modeling will be/was conducted for the following pollutants, and the analysis/protocol is:  
contained in the general file named: \_\_\_\_\_

- ☒ NO<sub>2</sub> ☒ PM<sub>10</sub> ☒ PM<sub>2.5</sub> ☒ SO<sub>2</sub> ☒ CO ☐ Pb ☐ H<sub>2</sub>S  
☐ Other (explain): \_\_\_\_\_

- ☐ The remaining Criteria Pollutants were compared to NAAQS/MAAQs in the RASS (Risk Assessment Screening Spreadsheet) using high-first-high (H1H) modeled concentrations as a screening step.

- ☐ All Criteria air pollutants were compared to NAAQS/MAAQs in the RASS (Risk Assessment Screening Spreadsheet) using high-first-high (H1H) modeled concentrations as a screening step.

- ☒ Criteria pollutants with health benchmarks were also included in the summation of hazard indices and cancer risks (e.g., NO<sub>2</sub> and lead).

- ☒ Except for using H1H values, inclusion/exclusion of different sources and different emission estimates, the AERA dispersion modeling will be /was the same as the criteria pollutant modeling.

Give any additional information about the Criteria Pollutant Modeling (list any deviations from EPA or MPCA guidance)?

**MPCA criteria modeling review summary**

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		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____

**MPCA criteria modeling summary review questions:**

Is there/will there be sufficient information about the criteria pollutants for the AERA? ☐ Yes ☐ No

**MPCA criteria modeling summary review notes:**

2. **Air dispersion model specifics** (mark all that apply):

☒ Only High-first-high (H1H) values will be/were specified in the model output setup ☐ Yes ☒ No

If no, explain:

For NO2 the 5 year average of the 98th percentile of daily maximum 1-hour averages was used to evaluate the impact of ANW in the area where the University of Minnesota source created impacts above the standard.

- ☒ AERMOD Version 11103 (e.g., 09292) will be/was used
- ☒ AERMOD Regulatory Default Option will be/was used
- ☒ AERMOD Concentration option will be/was used
- ☐ AERMOD Rural item will be/was used
- ☒ AERMOD URBANOPT item will be/was used
- ☒ AERMOD Non-Regulatory Default Option will be/was used
- ☐ Some non-default AERMOD items will be/was used (requires MPCA written approval)\*

\*FASTALL, FASTAREA, FLAT, POINTCAP, POINTHOR, etc., explain:

Please give any additional information for the Air Dispersion Model Summary (list any deviations from EPA or MPCA guidance)?

**MPCA air dispersion model specifics summary**

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		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____

**MPCA air dispersion model specifics review questions:**

Do you approve of the methods described above? ☐ Yes ☐ No

**MPCA air dispersion model specifics review notes:**

3. **Meteorological data summary:**

Does the modeling use five years of meteorological data? ☒ Yes ☐ No

☒ Was the latest version of MPCA pre-processed meteorological data used (06341 or 11059)?

If checked, enter the MPCA ZIP file name: MSPMPX5Y

Please indicate the three letter call sign, station name and the state the meteorological surface station is located in. (Ex.: MSP: Minneapolis/St. Paul, MN)

Pre-processed AERMET version 06341 or earlier files:

Pre-processed AERMET version 11059, with or without  
AERMINUTE version 11059 processing, files:

MSP

What meteorological upper air station was used? Station/Site: 94983

SITEDATA Facility/Site: MPX

PROFBASE elevation (meters): 254.2

What consecutive 5-year period will be used (e.g. 1986 - 1990 w/o AERSURFACE; 2001 - 2005 w/AERSURFACE):  
2006-2010

Note: If site-specific meteorological data will be collected and used, please follow the federal guidance (EPA's), as specified in section 8.3 and section 8.3.3.2 (QA/QC) of 40 CFR Part 51 dated 11/09/2005 (Appendix W).

☐ If site-specific meteorological data will be collected and used, where will the **location** of the meteorological tower be set (city and state, coordinates, etc.)? N/A

☐ If site-specific meteorological data will be collected and used, what **year** of data is proposed to be used? N/A

What justification(s) applies for the proposed surface and upper air stations identified above? (Check all that apply)

- ☒ Similar surface characteristics as meteorological tower      ☒ Proximity to surface and/or upper air station(s)  
☐ Similar land use characteristics      ☒ Similar wind patterns/characteristics  
☒ Other – Please describe: MPCA suggestion  
☐ AERSURFACE version: \_\_\_\_\_  
☐ (Land Cover) LULC data source: \_\_\_\_\_  
☐ Explain how LULC was parameterized: \_\_\_\_\_  
☐ A 10km by 10km domain for albedo and Bowen ratio will be/was used  
☐ A 1km radius domain for roughness height will be/was used  
☐ Yearly-averaged moisture conditions (wet, dry, or average) based on historical ranks will be/were accounted for in AERSURFACE (for the Bowen Ratio)? \_\_\_\_\_  
☐ Cultivated land (a.k.a. row crops or cropland;  $z_o \sim 0.01\text{m}$  to  $0.2\text{m}$ )  
☐ 50/50 mix of cultivated land and deciduous forest ( $z_o \sim 0.3\text{m}$  to  $0.8\text{m}$ )  
☐ Deciduous forest (and major urban downtown areas) ( $z_o \sim 0.5\text{m}$  to  $1.3\text{m}$ )  
☐ Unknown land use  
☐ Other criteria will be/were considered (explain): \_\_\_\_\_  
☐ EPA post-processors (such as LEADPOST) are proposed to be used.  
Please list: \_\_\_\_\_  
☐ Topography at the project site and potential NWS sites was considered.  
☐ Prevailing wind conditions at several potential NWS sites were considered.  
☐ Frequency of calm hours at several potential NWS sites were considered.  
☐ Frequency of missing data at several potential NWS sites were considered.

**If urban (URBANOPT), please indicate:**

Population: 1,000,000      Roughness height (meters): 1.0

Population rationale:

- ☐ Full Metropolitan Statistical Area (MSA)      ☐ Full Micropolitan Statistical Area (MSA)  
☐ Partial Metropolitan Statistical Area      ☐ Partial Micropolitan Statistical Area (MSA)  
☒ Other (specify): Population specified for MSP metro in MPCA FAR files

Roughness height rationale (e.g., project site estimated via National Land Cover Data (NLCD) with MPCA Land Use.

- ☒ The wind speed categories in the ME WINDCATS pathway will be set to default wind speeds in conjunction with no wind speed emission factors? ☒ Yes ☐ No  
a. If no, please list the user-specified wind speed categories as proposed: \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_  
b. Will these be used in conjunction with the SO EMISFACT WSPEED pathway? ☐ Yes ☐ No  
c. If yes, please list the user-specified wind speed emission factors as proposed: \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_

Please add additional information for the Meteorological Data Summary (list any deviations from EPA or MPCA guidance)?

**MPCA meteorological data summary**

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		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____
		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____

**MPCA meteorological data review questions:**

Do you approve of the methods described above? ☐ Yes ☐ No

**MPCA meteorological data review notes:**

**4. Terrain and geospatial summary** (AERMAP 09040: generally use NED data)

☒ AERMAP will be/was used. If not please explain: \_\_\_\_\_

Please write the AERMAP Version (e.g. 09040): 11103

USGS DEM Data will be/was used: Check the appropriate specification: ☐ None ☐ 1-degree ☐ 7.5 minute ☐ mix

☐ Other (specify): \_\_\_\_\_

☒ National Elevation Dataset NED: USGS Seamless Database 1 arcsecond

☒ UTM coordinates (NAD83, zone15 extended) will be/were used.

Note: All UTM coordinates must be in NAD83, **not** NAD27.

☐ If other please explain: \_\_\_\_\_

**Check the maximum terrain variation** (meters [m] – as applicable):

☐ Within 10m of shortest stack

☐ Within 10m of lowest fugitive source

☐ Within 100m of shortest stack

☐ Within 100m of lowest fugitive source

☐ Within 1000m of shortest stack

☐ Within 1000m of lowest fugitive source

Additional information for the Terrain and Geospatial Summary (list any deviations from EPA or MPCA guidance)?

See Figure A6 for terrain variation. There is not significant terrain variation within 1000 meters of the facility.

**MPCA terrain and geospatial summary**

<b>Submittal date(s)</b> (mm/dd/yyyy)	<b>Pre-app review date(s)</b> (mm/dd/yyyy)	<b>Pre-app adequacy</b>	<b>Post-app completeness review date(s)</b> (mm/dd/yyyy)	<b>Post-app completeness</b>	<b>Technical accuracy review date(s)</b> (mm/dd/yyyy)	<b>Technical accuracy</b>
		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____
		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____

**MPCA terrain and geospatial review questions:**

Do you approve of the methods described above? ☐ Yes ☐ No

**MPCA terrain and geospatial review notes:**

**5. Building summary** (BPIP-PRIME 04274: please use UTM coordinates and CSS approach):

☒ BPIP-Prime will be/was used.

If not please explain: \_\_\_\_\_

☐ BPIP option 1: MPCA defined “square” structure

☒ BPIP option 2: User defined “rectangular” structure

☐ BPIP option 3: pre-existing BPIP file; Filename

☒ All buildings will be/were included.

If not please explain: \_\_\_\_\_

☒ Composite single structures with multiple tiers will be/were used.

**Note:** Tiering of buildings must follow guidance from section 6 of the Oct. 2004 “MPCA Air Dispersion Modeling Guidance For Minnesota Title V Modeling Requirements And Federal Prevention of Significant Deterioration (PSD) Requirements (Version 2.2).”

Is the tallest modeled building height greater than or equal to the tallest height on Form MI-01? ☒ Yes ☐ No

Are all DISPERSE stack locations at the "building" center? ☐ Yes ☐ No ☒ Not Applicable

Additional information for the building summary (list any deviations from EPA or MPCA guidance)?

#### MPCA building summary

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		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____

#### MPCA building review questions:

Do you approve of the methods described above? ☐ Yes ☐ No

#### MPCA building geospatial review notes:

#### 6. Receptor summary:

- ☒ Receptors will be/were placed along the owned and controlled property boundary.  
☒ The modeling followed MPCA Guidance for Ambient Receptors (<http://www.pca.state.mn.us/nwqh421>).  
☐ If not, will/was a polar grid used?

	Spacing	Dimension	Number
a. Inside the property boundary(s):	50 meters	See ROU files	See ROU files
b. On the fenceline(s):	N/A meters	See ROU files	See ROU files
c. On the property line(s):	25 meters	See ROU files	See ROU files
d. Beyond the property line(s):	100 meters	See ROU files	See ROU files
<b>Total area</b>	Various	See ROU files	See ROU files

- ☐ Additional air dispersion modeling receptors will be/were placed at locations of additional risk receptors.  
Please describe these receptors:

N/A

- ☒ Flag pole receptors will be/were included. Please describe the flag pole receptors and how/why they were chosen:  
Flagpole receptors are modeled at the request of the MPCA to represent tall buildings and other elevated public areas.

Additional information for the receptor summary? (list any deviations from EPA or MPCA guidance)

MPCA Guidance was followed.

#### MPCA receptor summary

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		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____
		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____

#### MPCA receptor review questions:

Do you approve of the methods described above? ☐ Yes ☐ No

Is there a reason to consider that the presence of "flagpole" receptors which may experience higher concentrations than the maximum ground level concentrations? ☐ Yes ☐ No Why?

**MPCA receptor review notes:**

## AERA Emission Source Summary

What will be/is the minimum stack height modeled (in meters)? 6.1

What will be/is the maximum stack height modeled (in meters)? 36.3

Will/is the shortest modeled stack height equal to the shortest height on Form GI-04? ☒ Yes ☐ No

Will/were any stacks (be) merged? ☐ Yes ☒ No

If yes, which stacks will be/were merged?

If stacks will be/were merged will they be/were stacks merged per MPCA DISPERSE guidance? ☐ Yes ☐ No

If no explain how the stacks will be/were merged:

### MPCA example of merged stacks

Model ID & Form GI-04 SV_ID_No.	RASS Stack ID number	Stack Height (meters)	Stack Temperature (Kelvin)	Stack Velocity (m/sec)	Stack Diameter (meters)
1 (3 merged stacks from Form GI-04):		10.0 (lowest of 3 values below)	293 (lowest of 3 values below)	2.5 (lowest of 3 values below)	1.0 (lowest of 3 values below)
SV001		10.0	300	3.3	1.1
SV002		11.0	310	2.5	1.1
SV003		12.0	293	2.7	1.0
2 (SV004 only)		20	400	3.3	1.0
3 (SV005 only)		15	350	11.1	3.2
4 (Coal Pile)		1	293	0.001	20

### MPCA review questions:

Did the insignificant source characterization follow the AERA guidance? ☐ Yes ☐ No

Were stacks merged appropriately? ☐ Yes ☐ No

Do the stack parameters in the modeling correctly characterize the emission sources? ☐ Yes ☐ No

See the AERA-03 form for a summary of the source parameters used in the modeling.

Is the characterization technically correct? ☐ Yes ☐ No

### MPCA emission sources review notes:

☒ An operating scenario of less than 8760 hrs/day will be/was used and it is reflected in a permit limit or physical limit.

Are any of the point sources capped and/or have horizontal stacks (see guidance in section 6.1, AERMOD Implementation Guide (03/19/2009)) and accounted for in the following? ☐ No ☒ Yes → exit velocity(s) = 0.001 m/s

☐ Non-Default POINTCAP/POINTHOR\*

\*Please provide justification for use of non-default option in question b, below.

b. Additional information for this subsection:

### Volume sources:

☐ Yes ☒ N/A ☐ No – Please explain:

Please refer to the modeling guidance on calculating the lateral and vertical dimensions.

- a. Will there be any volume source(s) overlapping or within 1.0 meters of any receptors? ☐ No ☐ Yes\*

\*Volume source should be converted to an area source of commensurate size (per section 6.2 of the latest AERMOD Implementation Guide (03/19/2009)) or be further refined.

- b. Additional information for this subsection:

**Open pit sources:**

☐ Yes ☒ N/A ☐ No – Please explain:

**Stack parameters details** Information about insignificant sources can be found in the AERA-05 form.

Please fill out the table below or indicate a file where this information can be found (modeled values should match Form GI-04 values unless merged): *Spreadsheet submitted with AERA and with Criteria Modeling.*

**\* These column headings are for point sources and will change with different source types**

\*For area sources the column headings are: height (m), XINIT, YINIT, ANGLE, SZINIT

\*For volume sources the column headings are: height (m), SYINIT, SZINIT

\*For area circle the column headings are: height (m), Radius, Nvert, SZinit

\*For area poly the column headings are: height (m), Nvert, SZinit

RASS ID#	Source ID	Source type (point, volume, area, etc.)	*Stack height (meters)	*Stack temperature (Kelvin)	*Stack exit velocity (m/sec)	*Stack diameter (meters)	*	Facility descriptions
1								
2								
3								
4								
5								
6								
7								
8								
9								
10								
11								
12								
13								
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22								
23								
24								
25								

Additional information for the Emission Source Summary (list any deviations from EPA or MPCA guidance):

Explain any site specific uncertainty that might be associated with the modeling:

**MPCA Stack Parameters Review Summary**



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		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____

#### **MPCA stack parameters review questions:**

Do the stack parameters correctly characterize the emission sources? ☐ Yes ☐ No

Is the characterization technically correct? ☐ Yes ☐ No

#### **MPCA stack parameters review notes:**

#### **MPCA additional air dispersion modeling review questions:**

1. How accurate is the dispersion model to the actual site dispersion? What are the factors impacting the accuracy:
2. Please explain any site specific uncertainty related to the modeling:
3. If possible, describe the location of the maximum concentration for annual and hourly modeling (Note: In general air dispersion modeling analyses are designed not to underestimate concentrations. The exact locations of maximum risk may vary due to the exact time of emission releases, or actual dispersion which depends on weather conditions):
4. Describe any additional modeling or modeling validation conducted by MPCA staff:

## **Proposer/Preparer Instructions**

Boxes can be checked by clicking on them. Response areas will expand as necessary to include the complete response. Multiple dates can be added by using the "Enter key" (return key) after you type the first date. All Air Emission Risk Analysis (AERA) documents must be submitted electronically whether submitted with an air permit application or alone. AERA documents submitted with an air permit application must also be submitted in a hard copy. Hard copies of spreadsheets, like the Risk Assessment Screening Spreadsheet (RASS) and lengthy modeling files should include the first summary page of the document but do not need to include subsequent pages since the electronic version will be available for review.

If **all** of the requested forms and support documents **are not included** with an air permit application needing an AERA the air permit application **will be deemed incomplete**. This includes risk estimates for pre-existing facilities. MPCA staff will return this AERA form plus any other incomplete AERA forms to the applicant with deficiencies and remedies indicated in the *italicized* MPCA review areas. If forms were submitted pre-app they should be updated and re-submitted post-app with any *italicized* MPCA comments left in and changes summarized in the appropriate areas.

**Facility Information:** Fill in the Air Quality (AQ) Facility identification (ID) No. (Number), which is the first eight digits of the permit number for all new permits issued under the new operating permit program, Standard Industrial Classification (SIC) code, facility name and location, and submittal dates. The project proposer and AERA preparer should be people that MPCA staff can contact with general and technical questions about the AERA submittal.

## **MPCA Review Instructions**

### **Specific section/document review**

MPCA staff will summarize their review of specific sections/support documents by marking either "Yes" for adequate or "No" for deficient in the pre-app sections, or "Yes" for substantially complete or "No" for incomplete in the post-app sections, along with their initials. They will add comments on deficiencies and how they can be remedied in the summary section. When there are multiple submittals, include each new submittal date in the table with the corresponding review dates and comments, thus keeping a log of submittals.

### **Overall adequacy/completeness summary**

If **all** of the necessary sections/documents are present and follow the appropriate methods (i.e., follows the AERA, emissions and modeling guidance) MPCA staff will mark the appropriate overall summary section with either "Yes" for adequate in the pre-app section, or "Yes" for substantially complete in the post-app section. Otherwise they will mark "No" for deficient in the pre-app AERA



submittal determination section or “No” for incomplete in the post-app AERA determination section. They will add comments on deficiencies and how they can be remedied in the overall summary section. If this form is being submitted as a protocol indicate in the MPCA overall review notes whether the protocol is approved or has deficiencies. Remember an AERA submitted with an air permit application is not considered “substantially complete” until **all** necessary quantitative and qualitative information has been submitted, and MPCA staff have determined that appropriate methods have been used. **Please summarize these results in the AERA-01 form.** The AERA-01 form will be shared with the permit engineer conducting the permit application completeness review. If deficiencies are noted in this form during the completeness review then this form should also be shared with the permit engineer who will share it with the applicant.



# Minnesota Pollution Control Agency

520 Lafayette Road North  
St. Paul, MN 55155-4194

# AERA-04

Certification for Emergency  
Internal Combustion Engines  
Air Emissions Risk Analysis (AERA)

Doc Type: Air Emissions Risk Assessment – External Documentation

## Instructions on Page 3

## Facility Information

1. AQ Facility ID No.: 05300061 2. AQ File No.: \_\_\_\_\_

3. SIC Code: 8602 4. Date of submittal: \_\_\_\_\_

5. Facility name: Abbott Northwestern Hospital

6. Facility location

Street address: 800 28<sup>th</sup> Street South

City: Minneapolis State: MN Zip code: 55407 County: Hennepin

AQ = air quality ID = identification No. = number SIC = standard industrial classification

This certification must be signed by a responsible official and submitted with any Air Emissions Risk Analysis (AERA) where emissions from an internal combustion engine are not assessed because the engine is associated with emergency use only. Please review additional background information found in the accompanying instructions.

## Certification

I certify under penalty of law that the emission units listed below are for emergency use only, where an emergency internal combustion engine is an engine that is operated when unforeseen conditions result in disruption of electrical power to the stationary source.

“Emergency” or “emergency use only” does **not** include:

- Electrical generators used to supply electricity to a stationary source with an interruptible electrical power supply during times that the supplier has interrupted the supply as provided in the agreement governing the interruptible supply.
- Electrical generators operated at the request of the electric power supplier to assist in meeting peak electrical energy demand.

“Interruptible power supply” means that the owner/operator of a stationary source has agreed with the supplier of electricity which allows the supplier to restrict or discontinue supply of electricity for some specified time period after providing adequate prior notice.

## 7. Emission unit description:

(Column 1)	IC engine #1	IC engine #2	IC engine #3	IC engine #4	IC engine #5
<b>Stack/Vent No.</b>	see attachment				
<b>Type of Use</b>					
<b>Rated heat input</b> (mmBtu/hr)					
<b>Rated mechanical output</b> (HP and RPM)					
<b>Fuel type</b> (include % sulfur)					
<b>Fuel consumption rate</b> (gal/hr or cf/hr)					
<b>Stack height</b> (m)					
<b>Engine Location<sup>1</sup></b> UTM coordinates in NAD 1983					
<b>Testing frequency and duration</b>					

<sup>1</sup> Please provide a facility map, clearly labeling IC engines and their locations.

mmBtu = Million British Thermal Units  
gal/hr = gallons per hour  
UTM = Universal Transverse Mercator

HP = horse power  
cf/hr = cubic feet/per hour  
NAD = National Atmospheric Deposition

RPM = revolutions per minute  
m = meter

## 8. Additional information (optional):

(Column 1)	IC engine #1	IC engine #2	IC engine #3	IC engine #4	IC engine #5
Stack inside diameter (m)					
Stack velocity or flow Show units (m/s, m <sup>3</sup> /s, or ft <sup>3</sup> /min)					
Stack temperature (K)					
Urban or rural					
Nearest receptor distance (m)					

m/s = meter per second

m<sup>3</sup>/s = cubic meter per second

ft<sup>3</sup>/min = cubic feet per minute

K = Kelvin

m = meter

## Certification

I also certify, in accordance with Minn. R. 7007.0500, subp. 2 (K)(2) and subp. 2 (K)(3), that I have reviewed the procedures implemented by my facility to maintain compliance and that those procedures are, to the best of my knowledge and belief, reasonable to maintain compliance with all applicable requirements.

### Owner:

Print name: Mr. Daryl Schroeder  
Title: Vice President of Operations  
Signature: \_\_\_\_\_  
Date: \_\_\_\_\_  
Phone number: \_\_\_\_\_

### Operator:

Print name: \_\_\_\_\_  
Title: \_\_\_\_\_  
Signature: \_\_\_\_\_  
Date: \_\_\_\_\_  
Phone number: \_\_\_\_\_

## Instructions

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**1) AQ Facility ID No.** -- Fill in your Air Quality (AQ) Identification (ID) Number (No.).

**2) Facility name** – Enter your facility name

This certification is required under Minn. R. 7007.0500, subp. 3. This certification must be signed by a “responsible official” (defined in Minn. R.7007.0100, subp. 22), which is the person who performs policy or decision making functions for the company. (A delegate may be allowed in some cases. Please refer to the rule section listed above.) The certification also must be signed by a responsible official for each co-permittee. A co-permittee is a corporation, partnership, sole proprietorship, municipality, state, federal or other public agency other than the permittee that is either a owner or operator of the facility. If the permittee is the owner and a co-permittee is the operator (or vice-versa), then the responsible officials for both the permittee and the co-permittee must sign the certification.

**3) Emission unit description**

Information requested in Column One should be submitted for each stack corresponding with an internal combustion engine at an emergency generator or fire pump.

**Type of Unit** – Describe the application of the engine: emergency generator, fire pump.

**Rated heat input** – Enter the rated heat input of the engine, in units of million British thermal units (mmBtu) per hour.

**Rated mechanical output** – Fill in the rated output of the engine in horsepower at a specified RPM.

**Fuel type** – Fill in the fuel type (e.g., natural gas, diesel). For diesel fuel, provide the weight percent sulfur content.

**Fuel consumption rate** – Fill in the manufacturer’s rated fuel consumption for the engine. This information can be obtained from the manufacturer. If the engine has been derated, attach the supporting documentation.

**Stack height** – Enter the stack height for each stack associated with each engine. Units should be in meters.

**Engine location** – Describe the general location of each engine on the property, e.g., southwest corner of building. Alternatively, or in addition, a figure/sketch could be attached.

**Testing frequency and duration** -- Describe the testing frequency and duration for each emergency generator. If there is more than one emergency generator on the property, also indicate if generators are tested concurrently.

**4) Additional information (optional)**

The information requested in this item is necessary to perform modeling of an emissions source. This information is optional and can be provided if readily available. Stack parameters are important pieces of information in modeling emissions from any source.

Urban and rural descriptors are used to evaluate heat island effects and to provide information on land use. If the facility is located in an area that is neither urban nor rural, a project proposer can indicate a 50/50 mix (similar to AERMOD descriptors).

### Background Information for AERA-04, Certification of Emergency IC Engines

The MPCA considers “emergency” or “emergency use only” with respect to an emissions unit driven by an IC engine to mean use during unforeseen circumstances. Some examples include:

- Damage to the to the electric utility’s distribution equipment due to weather or circumstances beyond the owner’s control, such as lightning strikes, tornadoes, ice storms or floods which render electricity from the utility unavailable until repairs are made.
- Fires which result in the automatic start of need to start IC engine-driven fire pumps.
- Breakdown or loss of availability of electric motor-driven boiler feedwater pumps which require use of IC engine-driven feedwater pumps.

Equipment and/or emission units described as “standby” or “backup” are presumed also to be for emergency use only.

The MPCA also expects that in the case of electric generators that are large enough to keep a stationary source in operation during emergency interruption of power, that such generators be used only for orderly plant shutdown. They are not used to keep the source operating indefinitely during the emergency generation of power.

### Minimizing emissions and impacts from emergency IC engines

Owners of emergency IC engines are encouraged to minimize emissions from these engines through the following practices:

- Make test runs as short as allowed by insurance and building code considerations.
- Stagger test runs so all emergency units are not operated on the same day.
- For diesel-fueled engines, use diesel fuel with less than 0.05 percent sulfur.
- Avoid calm atmospheric conditions when testing so that emissions are quickly dispersed.
- Increase the discharge height of the stack to lower ground-level air concentrations.

Attachment to MPCA Form AERA-04  
Certification for Emergency Internal Combustion Engines  
Abbott Northwestern Hospital  
Facility ID 053-00061

Section 7.

Stack Vent No.	ANW_SV02	ANW_SV03	ANW_SV04	ANW_SV05	ANW_SV06	ANW_SV07	ANW_SV09	ANW_SV10	ANW_SV11	ANW_SV12	ANW_SV21
Rated Heat Input (mmBtu/hr)	4.6	4.6	5.1	5.1	6.8	2.4	6.2	6.2	6.2	2.1	19.3
Rated methanical Output (HP and RPM)	685	685	685	685	890	355	1,135	1,135	1,135	382	2,937
	1,800 Diesel 0.0015%	1,800 Diesel 0.0015%	1,800 Diesel 0.0015%	1,800 Diesel 0.0015%	1,800 Diesel 0.0015%	1,800 Diesel 0.0015%	1,800 Diesel 0.0015%	1,800 Diesel 0.0015%	1,800 Diesel 0.0015%	1,800 Diesel 0.0015%	1,800 Diesel 0.0015%
Fuel consumption rate (gal/hr)	33	33	37	37	49	17	45	45	45	15	138
Stack Height (m)	6.1	6.1	6.1	9.1	10.7	6.1	11.0	11.0	11.0	9.1	9.1
Engine Location (UTM NAD83)	479346, 4977967	479348, 4977967	479358, 4977967	479321, 4977966	479325, 4977975	479343, 4977755	479453, 4977933	479453, 4977934	479454, 4977935	479392, 4977625	479392, 4977626
Testing frequency and duration	(A)	(A)	(A)	(A)	(A)	(A)	(A)	(A)	(A)	(A)	(A)

Section 8.

Stack Inside Diameter (m)	0.20	0.20	0.20	0.20	0.20	0.12	0.27	0.27	0.27	0.15	0.29
Stack Velocity (m/s)	52.4	52.4	52.8	52.8	56.1	118.8	56.3	0.6	0.6	7.4	98.9
Stack Temperature (K)	786	786	764	764	783	800	752	752	752	807	673
Urban or Rural	Urban	Urban	Urban	Urban	Urban	Urban	Urban	Urban	Urban	Urban	Urban
Nearest Receptor Distance (m)	50	51	61	25	30	45	28	28	28	14	14

(A) Maintenance and readiness testing is typically conducted once per month for no more than 1 hour.



# Minnesota Pollution Control Agency

520 Lafayette Road North  
St. Paul, MN 55155-4194

# AERA-05

## Emissions Form Air Emissions Risk Analysis (AERA)

Doc Type: Air Emissions Risk Assessment – External Documentation

### Instructions on Page 8

**Purpose:** This form describes emission rates used in an AERA submitted prior to submitting an air permit application (pre-app) or with an air permit application (post-app). This form also documents the Minnesota Pollution Control Agency (MPCA) AERA emissions review. ***MPCA staff will fill out areas in italics during their review, indicating deficiencies and advising the applicant on how they can be remedied.*** Instructions on how to fill out this form are at the end of the form. For general information on estimating emissions for an AERA, please refer to the “AERA Guidance” on the MPCA website at <http://www.pca.state.mn.us/ktqh42a> and the “Guidance on Estimating Emissions for an AERA” at <http://www.pca.state.mn.us/udgx42e>. An AERA submitted with an air permit application is not considered “substantially complete” until **all** necessary quantitative and qualitative information has been submitted and MPCA staff have determined that appropriate methods have been used. **Submitting AERA materials for review prior to submitting an air permit application is highly recommended** so that site specific suggestions from MPCA staff can be included in AERA materials submitted with an air permit application.

## Facility Information

1. AQ Facility ID No.: 05300061	2. SIC Code: 8602
3. Date(s) of pre-application submittal: 3/1/2012 (mm/dd/yyyy)	4. Date(s) of permit application submittal: 3/30/2012 (mm/dd/yyyy)
5. Facility name: Abbott Northwestern Hospital	
6. Facility location Street address: 800 28 <sup>th</sup> St South	
City: Minneapolis	State: MN Zip code: MN County: Hennepin
7. Proposer: Mr. Timothy B. Grote	Phone: 612-863-4164 E-mail: tim.grote@allina.com
8. AERA Preparer: Mr. Ryan Birkenholz	Phone: 651-697-9737 E-mail: rbirkenholz@golder.com

Are there differences between the AERA emission estimates submitted pre-app and post-app?

☐ Yes ☐ No ☒ NA If yes please explain what and why:

**MPCA review question:** Are there differences between the AERA emission estimates submitted pre-app and post-app?

☐ Yes ☐ No ☐ NA If yes please explain what and why:

## MPCA Overall Summary of AERA Emissions Review

Names of MPCA AERA reviewers:

Submittal date (mm/dd/yyyy)	Pre-app review date (mm/dd/yyyy)	Overall pre-app AERA emissions determination (Select Yes for adequate, No for deficient, and enter reviewer's initials)	Post-app completeness review date (mm/dd/yyyy)	Overall post-app AERA emissions completeness determination (Select Yes for substantially complete, No for incomplete, and enter reviewer's initials)	**Technical accuracy review date (mm/dd/yyyy)	*Technical accuracy determination and reviewer's initials
		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____
		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____

**MPCA overall AERA emissions review questions:**

Do the emissions in the spreadsheet match the emissions in the risk modeling input? ☐ Yes ☐ No If the emissions used in the modeling do not match the spreadsheet, do the emissions in the risk modeling overestimate air concentrations (are the assumptions health protective)? ☐ Yes ☐ No

Do the emissions in the permit application match the emissions in the risk modeling input? ☐ Yes ☐ No If the emissions used in the permit application do not match the risk modeling input, do the emissions in the risk modeling overestimate air concentrations (are the assumptions health protective)? ☐ Yes ☐ No

Do the stack parameters in the risk modeling input match the air permit? ☐ Yes ☐ No If the stack parameters used in the risk modeling do not match the air permit, do the stack parameters in the risk modeling overestimate air concentrations (are the assumptions health protective)? ☐ Yes ☐ No

**MPCA overall AERA emissions pre-app review notes including comments on deficiencies and how they can be remedied:**

**MPCA overall AERA emissions post-app review notes including comments on deficiencies and how they can be remedied:**

**\*\*MPCA overall AERA emissions technical accuracy review notes including comments on deficiencies and how they can be remedied:**

**General Submittal Information** (Provide answers below).

**This form covers emission calculations on Excel spreadsheet(s) named:** See electronic submittal

Used in:

☒ Protocol named: See Air Dispersion modeling report

☐ RASS(s) named: \_\_\_\_\_

☒ Q/CHI spreadsheet(s) named: See electronic submittal

☒ AERMOD modeling in/output file(s) named: Too many to list in this document, please see readme file with modeling files.

☐ HHRAP based refined analysis file(s) named: \_\_\_\_\_

Will there be/have there been deviations from the general "AERA Guidance" on the MPCA website at <http://www.pca.state.mn.us/ktqh42a> and the "Guidance on Estimating Emissions for an AERA" at <http://www.pca.state.mn.us/udgx42e>?

☐ Yes ☒ No If yes please explain what and why:

**MPCA review questions:**

Are the changes between pre-app and post-app acceptable? ☐ Yes ☐ No ☐ NA Please explain why:

Are the deviations from the guidance acceptable? ☐ Yes ☐ No ☐ NA Please explain why:

## Emission Source Summary (See the AERA-03 Form for a summary of the source parameters used in the AERA modeling)

There are...	All will be/were quantified in the AERA	*Some will not be/were not quantified in the AERA	*None will be/were quantified in the AERA
<input checked="" type="checkbox"/> Combustion stack/vent point sources	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/> Non-combustion stack/vent point sources	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/> Onsite mobile source tail pipe emissions	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/> Idling vehicle tail pipe emissions	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/> Onsite fugitive emission sources	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/> paved roads	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<input type="checkbox"/> unpaved roads	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/> storage/surge piles	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/> material handling operations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input checked="" type="checkbox"/> valve, tanks, equipment leaks	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<input type="checkbox"/> other, describe below	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Examples of fugitive emissions include but are not limited to traffic on paved and/or unpaved roads, stockpiles of various materials, wind erosion, loadout, etc. Please describe any other fugitive emissions:

☒ Yes ☐ No

**\*Some emission sources at the facility will not be/ were not quantified in the AERA per AERA guide section 2.3. In the table below describe the emission source(s) not quantified next to the appropriate explanation.**

Source description:	The sources not quantified will be/are:
Small natural gas fired hot water heaters.	<p>"Insignificant activities" defined in Minn. R. 7007.1300 (and its associated emissions) and only emits chemicals that are also emitted by sources/units already included in the emission inventory, and the contribution of the individual activity is less than 1% of the total emission inventory for a chemical (hourly for acute and annual for chronic).</p> <p><input type="checkbox"/> Demonstration calculations included.</p>
Building ventilation	Emitters of chemicals that do not have inhalation health benchmarks listed in the RASS.
EU05-10, EU15-18, EU21	Internal combustion engines associated with an emergency generator and/or fire pump and is described in AERA-04 Emergency Internal Combustion Engine Certification Form.
	Associated only with startup, shutdown, and/or emergency situations.
	Screened out because it had total risks below risk driver levels (0.1 for non-carcinogens or 10-6 for carcinogens) using the RASS(s) named:
	Other (e.g., case by case determination on vehicle emissions):

### MPCA emission source review summary:

Submittal date(s) (mm/dd/yyyy)	Pre-app review date(s) (mm/dd/yyyy)	Pre-app adequacy	Post-app completeness review date(s) (mm/dd/yyyy)	Post-app completeness	**Technical accuracy review date(s) (mm/dd/yyyy)	**Technical accuracy
		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____
		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____



**MPCA emission source review questions:**

Did the insignificant source characterization follow the AERA guidance? ☐ Yes ☐ No

Do the stack parameters in the modeling correctly characterize the emission sources? ☐ Yes ☐ No  
(See the AERA-03 form for a summary of the source parameters used in the AERA modeling.)

\*\*Are the stack parameter characterizations technically correct? ☐ Yes ☐ No

MPCA emission sources review notes:

## Operating Scenario Summary

The project proposer may choose to assess emissions at the facility's potential to emit (PTE) as defined by state and federal rules. Alternatively or in addition, the project proposer may estimate another future operating scenario, defined in the AERA guidance as "future estimated actual emissions". Please indicate what type of emissions will be/were assessed:

☒ Potential to emit ☐ Future estimated actual

If future estimated actual emissions will be/are used, provide business case description to support future case, three years of Toxic Release Inventory (TRI) information for existing facilities, and propose production-based permit limits (AERA Guide section 2.3.7):

☒ An operating scenario of less than 8760 hrs/day will be/was used and is reflected in a permit limit or physical limit.

Explain: There are fuel limits on GP001 and GP003.

☐ Emission calculations will include/included capture and control efficiencies.

☐ Will/were different methods (be) used for the emissions that will be/were calculated for the proposed and pre-existing project calculations?

Explain:

**MPCA operating scenario summary review summary:**

<b>Submittal date(s)</b> (mm/dd/yyyy)	<b>Pre-app review date(s)</b> (mm/dd/yyyy)	<b>Pre-app adequacy</b>	<b>Post-app completeness review date(s)</b> (mm/dd/yyyy)	<b>Post-app completeness</b>	<b>**Technical accuracy review date(s)</b> (mm/dd/yyyy)	<b>**Technical accuracy</b>
		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____
		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____

**MPCA operating scenario summary review questions:**

Was there adequate support for using future estimated actual emissions? ☐ Yes ☐ No

Does the limited operating scenario reflect a permit limit or physical limit? ☐ Yes ☐ No

Are the emissions estimates for the facility before and after the project comparable? ☐ Yes ☐ No

If no, explain:

Are the capture and control efficiencies assumed appropriate and do they correspond to the permit application information?

☐ Yes ☐ No

MPCA operating scenario summary review notes:

## Emission Factor Summary

Indicate which emission factors were generated using each of the sources listed below:

Chemical(s), source type(s) or emission unit(s) (e.g. NO <sub>2</sub> , natural gas heaters, EU001)	Emission factor reference	Table number or specific reference identifier	Publication or report date	Rationale for selecting data source
	Permit Limit:			
GP001, GP003, GP005	AP-42 Natural gas emissions factors (except those with E rated emission factors based on detection limits).	1.4-1 1.4-2 1.4-3 1.4-4	7/98	
GP002, GP004	AP-42: 3.4 & 3.3	3.4-1 3.4-2 3.4-3 3.4-4	10/96	No better emission factors known
	FIRE:			
	CaTEF:			
	Material Safety Data Sheets:			
	EPA emission models <input type="checkbox"/> TANKS <input type="checkbox"/> MOVES <input type="checkbox"/> LandGEM			
	Chemical analyses of feedstocks and products (conservation of mass calculations):			
	Trade or industry organization Emission Factor Database, reports, publications:			
	Peer-Reviewed technical literature:			
	Toxic Release Inventories:			
EU27	Vendor provided data			
<input type="checkbox"/> Fill out table below	Facility stack tests:			
<input type="checkbox"/> Fill out table below	Similar facility stack tests:			
	Other (explain):			

Was a reasonable level of effort made to identify all COPI, i.e., was readily available information considered? ☒ Yes ☐ No

Was there conflicting information between different sources? ☐ Yes ☐ No If yes, explain why these sources were chosen:

Not applicable.

Were additional potential sources of emissions information considered and rejected? ☐ Yes ☒ No If yes, explain why:

### MPCA emission factors summary review:

Submittal date(s) (mm/dd/yyyy)	Pre-app review date(s) (mm/dd/yyyy)	Pre-app adequacy	Post-app completeness review date(s) (mm/dd/yyyy)	Post-app completeness	**Technical accuracy review date(s) (mm/dd/yyyy)	**Technical accuracy
		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____

	<input type="checkbox"/> Yes <input type="checkbox"/> No <i>Init:</i> _____		<input type="checkbox"/> Yes <input type="checkbox"/> No <i>Init:</i> _____		<input type="checkbox"/> Yes <input type="checkbox"/> No <i>Init:</i> _____
--	--	--	--	--	--

**MPCA emission factors review questions:**

Do you know of better emission factor sources? ☐ Yes ☐ No

If yes, how were conflicting or alternative emission sources considered:

Did the emission estimates follow the AERA guidance? ☐ Yes ☐ No

Are all of the pollutants expected from a source accounted for? ☐ Yes ☐ No

MPCA emission factors review notes:

## Summary of Emission Factors Developed from Stack Tests

Has the facility done air toxics stack testing? ☐ Yes ☒ No

If yes please list the chemicals, unit(s) or source(s) tested and test report date(s) in the table below. In addition, if stack testing results will be/were used in the AERA, indicate (by letter) which of the following preferred calculation methods will be/were used?

**Calculation methods**

- Method A: The ProUCL recommended 95% upper confidence limit of the arithmetic mean (UCL-AM) will be/was used for annual (tons/yr) estimates.  
☐ A copy of the ProUCL runs is/will be included.
- Method B: The **highest** measured value of stack test data will be/was used for annual (tons/yr) estimates because there were not enough data points for ProUCL to recommended 95% UCL -AM.
- Method C: The **highest** measured value will be/ was used for hourly (lb/hr) estimates.  
☐ A copy of the ProUCL runs will be/is included.
- Method D: Instrument measured values will be/were included even if below the method detection limit.
- Method E: Instrument detection limit for data with no measured values will be/were used.
- Method F: One-half the instrument detection limit will be/was used for acrolein.
- Method G: If a chemical was not expected to be present but was tested for and assigned a zero for the risk assessment justification will be/was provided.
- Method H: Other, Please describe:

Chemical(s)	Emission source type or emission unit(s)	Test report reference including date	Calculation method(s) A-H

**MPCA review of emission factors developed from stack tests**

Submittal date(s) (mm/dd/yyyy)	Pre-app review date(s) (mm/dd/yyyy)	Pre-app adequacy	Post-app completeness review date(s) (mm/dd/yyyy)	Post-app completeness	Technical accuracy review date(s) (mm/dd/yyyy)	Technical accuracy

	<input type="checkbox"/> Yes <input type="checkbox"/> No <i>Init: _____</i>		<input type="checkbox"/> Yes <input type="checkbox"/> No <i>Init: _____</i>		<input type="checkbox"/> Yes <input type="checkbox"/> No <i>Init: _____</i>
	<input type="checkbox"/> Yes <input type="checkbox"/> No <i>Init: _____</i>		<input type="checkbox"/> Yes <input type="checkbox"/> No <i>Init: _____</i>		<input type="checkbox"/> Yes <input type="checkbox"/> No <i>Init: _____</i>

**MPCA emission factors developed from stack tests review questions:**

Was the AERA guidance on using stack testing data followed? ☐ Yes ☐ No

Emission factors developed from stack tests review notes:

## Summary of Chemicals with Additional Considerations (AERA Guidance Section 2.6)

Which of the following calculations will be/were done:

- ☐ Dioxins/furans will be/were estimated as individual congeners, with individual congeners/total mass ratios from submitted stack tests.
- ☐ Dioxins/furans will be/were estimated as Toxic Equivalents of 2,3,7,8 TCDD using the 2005 WHO potency factors.
- ☐ PCBs will be/were expressed as a total mass.
- ☐ PCBs will be/were expressed as Toxic Equivalents of 2,3,7,8 TCDD using the 2005 WHO potency factors.
- ☐ Aldehydes will be/were estimated as a total mass.
- ☒ Individual aldehydes will be/were estimated.
- ☐ Petroleum Hydrocarbons-Alipatic (C7-C11) will be/were estimated as a total mass.
- ☐ Hexavalent Chromium will be/was assumed to be equal to total Chromium.
- ☐ Hexavalent Chromium will be/was assumed to be 10 % of total Chromium.
- ☒ Hexavalent Chromium will be/was assumed to be a site specific MPCA guidance % of total Chromium and the stack testing used to derive this ratio was submitted or some other reference.
- ☐ Glycol ethers will be/were estimated as a total mass.
- ☐ Individual glycol ethers will be/were estimated.
- ☒ Individual PAHs will be/were estimated.
- ☐ PAHs will be/were estimated as a total mass (and will therefore be assessed as benzo(a)pyrene)
- ☒ Individual Polycyclic Organic Matter chemicals will be/were estimated.
- ☐ Polycyclic Organic Matter will be/was estimated as a total mass.
- ☐ All NOx will be/were assumed to be NO<sub>2</sub>.
- ☒ 80% of the NOx will be/was assumed to be NO<sub>2</sub> (based on EPA's ambient or equilibrium ratio)
- ☐ Asbestos-like fiber emission estimates will be/were given, modeled and compared to the current IRIS value.
- ☐ Mercury will be emitted above 1 lb/year and a Hg-01 form will be/ was submitted.
- ☐ None of the calculations listed above will be/were used.

**MPCA review of chemicals with additional considerations summary**

Submittal date(s) (mm/dd/yyyy)	Pre-app review date(s) (mm/dd/yyyy)	Pre-app adequacy	Post-app completeness review date(s) (mm/dd/yyyy)	Post-app completeness	Technical accuracy review date(s) (mm/dd/yyyy)	Technical accuracy
		<input type="checkbox"/> Yes <input type="checkbox"/> No <i>Init: _____</i>		<input type="checkbox"/> Yes <input type="checkbox"/> No <i>Init: _____</i>		<input type="checkbox"/> Yes <input type="checkbox"/> No <i>Init: _____</i>
		<input type="checkbox"/> Yes <input type="checkbox"/> No <i>Init: _____</i>		<input type="checkbox"/> Yes <input type="checkbox"/> No <i>Init: _____</i>		<input type="checkbox"/> Yes <input type="checkbox"/> No <i>Init: _____</i>

**MPCA chemicals with additional considerations review questions:**

Was the special emission factor guidance for these pollutants followed? ☐ Yes ☐ No

MPCA chemicals with additional considerations review notes:

## Additional Emissions Information

Is there additional site specific uncertainty related to the emissions beyond what is captured in the emission factor development?

☐ Yes ☒ No If yes, please explain:

Are there applicable control standards and/or NESHAPs related to toxics controls? ☒ Yes ☐ No If yes, list them:

*The emergency generators will be subject to periodic maintenance activities starting May 2013.*

☐ Determination of Technical and Economic Feasibility will be/was prepared because risk estimates were above risk guidelines (AERA Guide Section 3.9) Explain:

#### **MPCA additional emissions information review summary**

<b>Submittal date(s)</b> (mm/dd/yyyy)	<b>Pre-app review date(s)</b> (mm/dd/yyyy)	<b>Pre-app adequacy</b>	<b>Post-app completeness review date(s)</b> (mm/dd/yyyy)	<b>Post-app completeness</b>	<b>Technical accuracy review date(s)</b> (mm/dd/yyyy)	<b>Technical accuracy</b>
		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____
		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____		<input type="checkbox"/> Yes <input type="checkbox"/> No Init: _____

#### **MPCA additional emissions information review questions:**

*Describe qualitatively the uncertainty related to these emission estimates. Include how close the emission estimates are to what the facility will actually emit. What are the factors that impact this?*

*If risk estimates are above risk guidelines was feasible and reasonable control used?* ☐ Yes ☐ No

#### **MPCA additional emissions information review notes:**

## **Proposer/Preparer Instructions**

Boxes can be checked by clicking on them. Response areas will expand as necessary to include the complete response. Multiple dates can be added by using the "Enter key" (return key) after you type the first date. All Air Emission Risk Analysis (AERA) documents must be submitted electronically whether submitted with an air permit application or alone. AERA documents submitted with an air permit application must also be submitted in a hard copy. Hard copies of spreadsheets, like the Risk Assessment Screening Spreadsheet (RASS) and lengthy modeling files should include the first summary page of the document but do not need to include subsequent pages since the electronic version will be available for review.

If **all** of the requested forms and support documents **are not included** with an air permit application needing an AERA the air permit application **will be deemed incomplete**. This includes risk estimates for pre-existing facilities. MPCA staff will return this AERA form plus any other incomplete AERA forms to the applicant with deficiencies and remedies indicated in the *italicized* MPCA review areas. If forms were submitted pre-app they should be updated and re-submitted post-app with any *italicized* MPCA comments left in and changes summarized in the appropriate areas.

**Facility Information:** Fill in the Air Quality (AQ) Facility identification (ID) No. (Number), which is the first eight digits of the permit number for all new permits issued under the new operating permit program, Standard Industrial Classification (SIC) code, facility name and location, and submittal dates. The project proposer and AERA preparer should be people that MPCA staff can contact with general and technical questions about the AERA submittal.

## **MPCA Review Instructions**

### **Specific section/document review**

*MPCA staff will summarize their review of specific sections/support documents by marking either "Yes" for adequate or "No" for deficient in the pre-app sections, or "Yes" for substantially complete or "No" for incomplete in the post-app sections, along with their initials. They will add comments on deficiencies and how they can be remedied in the summary section. When there are multiple submittals, include each new submittal date in the table with the corresponding review dates and comments, thus keeping a log of submittals. \*\*Questions with two asterisks are part of the technical accuracy review.*

### **Overall adequacy/completeness summary**

If **all** of the necessary sections/documents are present and follow the appropriate methods (i.e., follows the AERA, emissions and modeling guidance) MPCA staff will mark the appropriate overall summary section with either "Yes" for adequate in the pre-app section, or "Yes" for substantially complete in the post-app section. Otherwise they will mark "No" for deficient in the pre-app AERA submittal determination section or "No" for incomplete in the post-app AERA determination section. They will add comments on deficiencies and how they can be remedied in the overall summary section. Remember an AERA submitted with an air permit application is not considered "substantially complete" until **all** necessary quantitative and qualitative information has been submitted, and MPCA staff have determined that appropriate methods have been used. **Please summarize these results in the AERA-01 form.** The AERA-01 form will be shared with the permit engineer conducting the permit application completeness review. If deficiencies are noted in this form during the completeness review then this form should also be shared with the permit engineer who will share it with the applicant.



**Minnesota Pollution  
Control Agency**

520 Lafayette Road North  
St. Paul, MN 55155-4194

# AERA-24

## AERA Certification

*Doc Type: Air Emissions Risk Assessment – External Documentation*

### Facility Information

- 1a) AQ Facility ID No.: 05300061
- 2) Facility Name: Abbott Northwestern Hospital

### Certification

I certify under penalty of law that the enclosed documents and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete.

#### Permittee Responsible Official:

Name  
(Print): Mr. Daryl Schroeder

Title: Vice President of Operations

Signature: \_\_\_\_\_

Date: \_\_\_\_\_

#### Co-Permittee Responsible Official (if applicable)

Name  
(Print): \_\_\_\_\_

Title: \_\_\_\_\_

Signature: \_\_\_\_\_

Date: \_\_\_\_\_

### Instructions for Form AERA-24

- 1a) AQ Facility ID No.** -- Fill in your Air Quality (AQ) Facility Identification (ID) Number (No.). This is the first eight digits of the permit number for all new permits issued under the operating permit program. If your facility has never been issued a permit under this program, leave this line blank.
- 2) Facility Name** -- Enter your facility name.

This certification is required under Minn. R. 7007.0500, subp. 3. The certification must be signed by a “responsible official” (defined in Minn. R. 7007.0100, subp. 21), which is the person who performs policy or decision making functions for the company. (A delegate may be allowed in some cases. Please refer to the rule section listed above.) The certification also must be signed by a responsible official for each co-permittee. A co-permittee is a corporation, partnership, sole proprietorship, municipality, state, federal or other public agency other than the permittee that is either a owner or operator of the facility. If the permittee is the owner and a co-permittee is the operator (or vice-versa), then the responsible officials for both the permittee and the co-permittee must sign the certification.

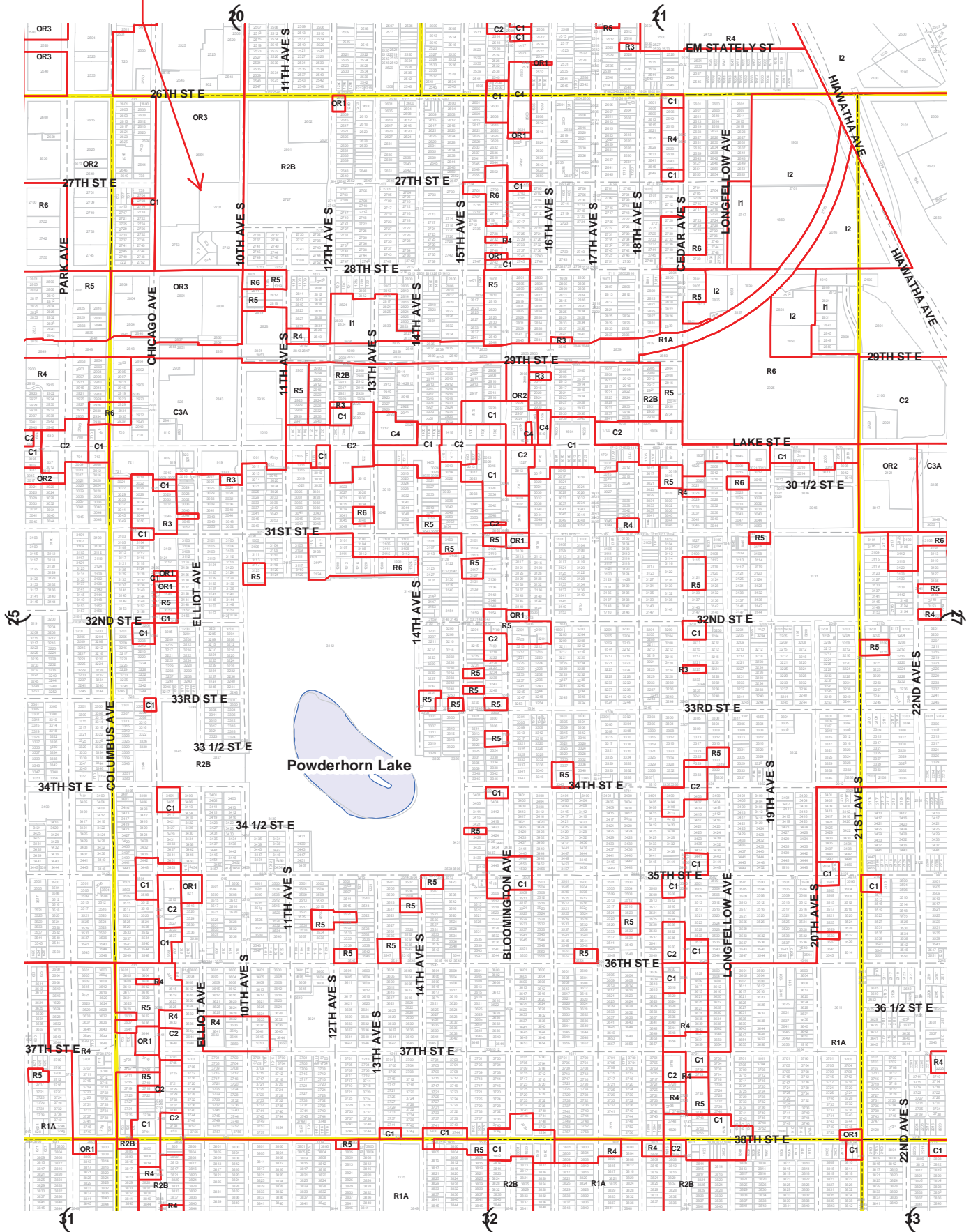
**It is recommended that you not sign the certification until you have completed your AERA and are ready to submit it. Do not modify or add to this form.**

APPENDIX C  
SUPPORTING INFORMATION



Abbott Northwestern

# PRIMARY ZONING DISTRICTS



## RESIDENCE DISTRICTS

- LOW DENSITY
- R1
- R2
- R3
- R4
- R5
- R6
- MEDIUM DENSITY DISTRICTS
- C1
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- HIGH DENSITY DISTRICTS
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## OFFICE RESIDENCE DISTRICTS

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## DOWNTOWN DISTRICTS

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## INDUSTRIAL DISTRICTS

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ADJOINING PLATE NUMBER

Last Amended : December 17, 2010

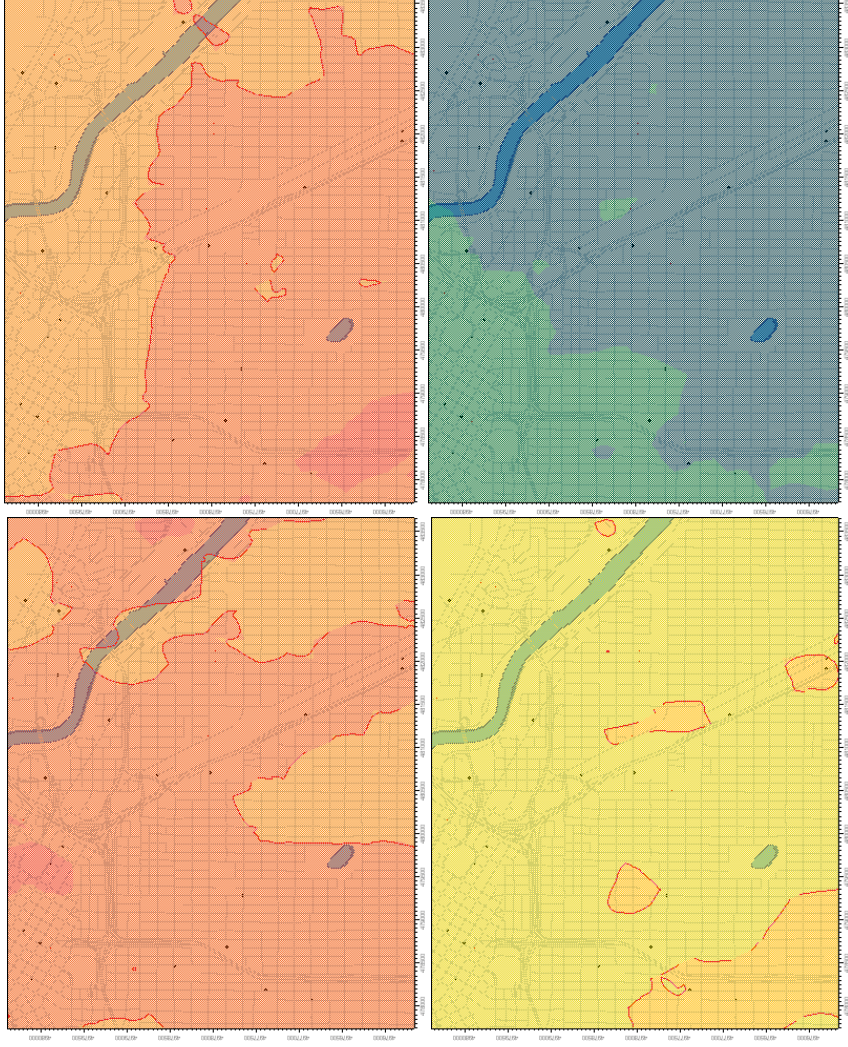
Primary Zoning Plate Boundaries



MINNEAPOLIS ZONING PLATE 26

## FIGURE C1-C4

Figures C1 – C4. These 4 figures represent modeled relative hourly concentrations of  $\text{NO}_2$ . This set of figures allows one to compare relative contributions to  $\text{NO}_2$  from C1, top left) on road mobile sources, C2, top right) area sources, C3, bottom left) off road mobile sources and C4, bottom right) point sources. These figures do not represent a refined hotspot modeling effort. MPCA staff is working on refining an effort to provide visual (i.e. a map) representation of short term respiratory risks.



Higher risk is indicated by red. Risk decreases from orange to yellow, to green with blue being lowest.

APPENDIX D  
WIMN Tables



TABLE D1 - WHAT'S IN MY NEIGHBORHOOD, LEVEL 0, ALL SITES		
Site Name	Address	City
Sam Miller Corp	111 3rd Ave S Ste 310	Minneapolis
NRG - Riverside Plant	2450 Riverside Ave	Minneapolis
Velocity Technology Solutions Inc	1200 Washington Ave S Ste 200	Minneapolis
Co Project 9020	SAP 27-637-03	CSAH 37 (4th St SE) betwe
Minneapolis Public Library	310 Nicollet Mall	Minneapolis
Central Ave NE - TH 65 Paving	See location description	Minneapolis
BK Hauling & Recycling - Chicago Ave	2123 Chicago Ave S	Minneapolis
N Douglas (E) & Groveland Ave	See location description	Minneapolis
Folwell Paving Project	See location description	Minneapolis
Glenwood Residential Paving Project	Address Unknown	Minneapolis
Cedar Lake Park Trl	See location description	Minneapolis
Former Mpls Gas Works	70 10th Ave S	Minneapolis
Powderhorn Park	3400 15th Ave S	Minneapolis
Lake Harriet & Lake Calhoun Parks	See location description	Minneapolis
West River Pkwy Improv	See location description	Minneapolis
Minneapolis City Hall/Courthall	350 S 5th St Ste 105	Minneapolis
SP 2726-61 (TH 47)	TH 47 from 27th Ave NE to	Minneapolis
Mill Ruins Park Phase 3	See location description	Minneapolis
Metro Transit - Nicollet Garage	10 32nd St W	Minneapolis
Portland Place Housing Development	See location description	Minneapolis
U of M SE Steam Plant Rehab Phase 1	600 Main St SE	Minneapolis
Heritage Park Phase II	See location description	Minneapolis
Residential - Bloomington Ave	2901 Bloomington Ave S	Minneapolis
Lake Hiawatha Flood Area 27	See location description	Minneapolis
Nine Mile Creek Watershed District	Address Unknown	Edina
Hennepin County Crime Lab Unit	531 Park Ave S	Minneapolis
Cepro Grain Elevator Demolition	2836 11th Ave S	Minneapolis
LaSalle Ave Construction Project	See Location Description	Minneapolis
Chicago Ave Bridge and Paving	See location description	Minneapolis
Macy's Department Store Nicollet Mall	700 Nicollet Mall	Minneapolis
Franklin Lofts Renovation Project	111 E Franklin Ave	Minneapolis
Radisson Plaza Hotel Minneapolis	35 S 7th St	Minneapolis
First Covenant Church	810 S 7th St	Minneapolis
Midtown Greenway Phase II	See Location Description	Minneapolis
Hilton Hotel Minneapolis	1001 Marquette Ave	Minneapolis
29th St Midtown Greenway - Phase 3	See location description	Minneapolis
Former Despatch Laundry	113 26th St E	Minneapolis
Midtown Exchange	See Location Description	Minneapolis
Midtown Exchange - Tract M	See Location Description	Minneapolis
The Conservatory on Nicollet	800 Nicollet Mall Ste 501	Minneapolis
Response Action Implementation	Lite Yar	See Location Description
River Run	1448 Marshall St	Minneapolis
Wreck Brothers Auto Inc - Mpls	3749 Chicago Ave	Minneapolis
Phamer Building	2644 Nicollet Ave S	Minneapolis
Quality Paint & Autobody Inc	3452 Lyndale Ave S	Minneapolis
Metro Transit	707 16th Ave S	Minneapolis

TABLE D1 - WHAT'S IN MY NEIGHBORHOOD, LEVEL 0, ALL SITES		
Que Computers Inc	2600 26th Ave S Ste 100	Minneapolis
Twin Cities Mechanical Wars	3536 15th Ave S	Minneapolis
The Nicollet	1001 Nicollet Ave	Minneapolis
U of M Tennis Facility Addition - CSW	See location description	Minneapolis
Chicago Plaza Phase IIB	Chicago Ave	Minneapolis
Bryant Village - CSW	See Location Description	Minneapolis
Asset Accumulation Corp	2917 Bryant Ave S	Minneapolis
Skyscape - CSW	See location description	Minneapolis
Ivy Tower Hotel & Residence - CSW	See location description	Minneapolis
Ford Deep Rock	See location description	Minneapolis
West River Parkway	See location description	Minneapolis
Milwaukee Road Depot	See location description	Minneapolis
Norm McGrew Place	316 Norm McGrew Place	Minneapolis
2611-2627 Franklin Ave	2611-2627 E Franklin Ave	Minneapolis
Minnesota Business and Technology Center	511 11th Ave S	Minneapolis
Bureau of Engraving (Fourth Street)	500 S 4th St	Minneapolis
Urban Ventures	3040 - 3050 4th Ave S	Minneapolis
Nico	2924-2932 Stevens Ave S	Minneapolis
Nico North	2902-2912 Stevens Ave S	Minneapolis
The Flour Exchange	310 4th Ave S	Minneapolis
Old Location of Union Scrap	See location description	Minneapolis
Minneapolis Property Swap	W River Parkway and 13th Ave S	Minneapolis
Drummond Property	600 Main St SE & 106 - 6th Ave	Minneapolis
Phillips Eco-Enterprise Center	21st Ave S & 29th St E	Minneapolis
Applause	2841 Hennepin Ave	Minneapolis
Hiawatha Construction Yard	See Location Description	Minneapolis
Norwest Zone Railyard	See location description	Minneapolis
Vacant Lot - Mpls	3408 Snelling Ave	Minneapolis
Industry Square Redevelopment	1101 W River Parkway	Minneapolis
Minneapolis Convention Center-Expansion	See Location Description	Minneapolis
Urban Ventures II (Merc)	2900 & 2916 4th Ave S	Minneapolis
North Third Street Property	735	763
Opus - Minneapolis	See location description	Minneapolis
Proposed LRT Yard & Shops Site	See location description	Minneapolis
Royalston Ave Bridge Construction Site	Royalston Ave & Glenwood Ave	Minneapolis
Rex Oil	2840 Bryant Ave S	Minneapolis
Sexton Building	529 S 7th St	Minneapolis
Minneapolis Campus South Block	See Location Description	Minneapolis
Project For Pride and Living	3515 Chicago Ave S	Minneapolis
Coffman Memorial Union	300 Washington Ave SE	Minneapolis
The Free Store	2438 Bloomington Ave	Minneapolis
118 E 26th St Site	118 E 26th St	Minneapolis
MIDTOWN GREENWAY (Phase Two)	See Location Description	Minneapolis
Northrop Mall Pedestrian Bridges	300 Block of Washington Ave SE	Minneapolis
3023/3033 Snelling Avenue	3023/3033 Snelling Ave	Minneapolis
29th Street Corridor Tunnel	See Location Description	Minneapolis
Urban Garden Townhomes	3501 Bloomington Ave S	Minneapolis

TABLE D1 - WHAT'S IN MY NEIGHBORHOOD, LEVEL 0, ALL SITES		
Minneapolis Heart Hospital	See Location Description	Minneapolis
Main Heating Plant	1180 Main St SE	Minneapolis
Franklin Station Townhomes	See location description	Minneapolis
U of M 10th Avenue Bridge	10 1/2 10th Ave SE	Minneapolis
Pillsbury "A" Mill Complex	335 Main St SE	Minneapolis
Urban Garden - 27th St	107-109 E 27th St	Minneapolis
Machinery Lofts	2848 Pleasant Ave	Minneapolis
Minneapolis American Indian Center	1530 E Franklin Ave	Minneapolis
Photos	Inc	2601 Minnehaha Ave S
VIP Phase II	See location description	Minneapolis
The Carlyle	See location description	Minneapolis
Milwaukee Road Depot - Block D East	See location description	Minneapolis
Greenway Terrace Development	2850 Cedar Ave S	Minneapolis
Midtown Corridor Phase 3	2707 31st Ave S	Minneapolis
St. Peter Formation	See location description	Minneapolis
Rock Island Yard Fuel Oil	See location description	Minneapolis
G & K Stoddard Fluid	See Location Description	Minneapolis
HCRRA ROW	See Location Description	Minneapolis
Metro Transit Nicollet Garage - SW	10 32nd St W	Minneapolis
Metro Transit Police Station - SW	2425 Minnehaha Ave	Minneapolis
Graves 601 Hotel	601 1st Ave N	Minneapolis
The Bridgewater - CSW	See location description	Minneapolis
NRG Energy Center Minneapolis	816 S 4th Ave	Minneapolis
Dayton Rogers Manufacturing Co	2824 13th Ave S	Minneapolis
Mechanical Engineering Bldg	111 Church St SE	Minneapolis
Soo Line Plant	105 S 5th St	Minneapolis
Commercial Property (koch)	2500 Minnehaha Ave	Minneapolis
Liquor Depot	1010 Washington Ave S	Minneapolis
JO Peterson Building	1501 Washington Ave S	Minneapolis
180 Degrees Inc	236 Clifton Ave S	Minneapolis
Acme Foundry Co	3161 Hiawatha Ave	Minneapolis
Artcraft Press	907-929 Portland Ave S	Minneapolis
U of M Rowing Facility	See location description	Minneapolis
Anishinabe Bii-Gii-Wiin	Franklin Ave & Hiawatha Ave	Minneapolis
Lumen Building	See Location Description	Minneapolis
Parcel F	See location description	Minneapolis
Le Parisien - Lyndale	2301 Lyndale Ave S	Minneapolis
Cristo Rey Collin Powell - CSW	2924 4th Ave S	Minneapolis
CSOM West Bank Parking Lot - CSW	See Location Description	Minneapolis
Minneapolis city of - Asphalt Plant	1925 E 26th St	Minneapolis
Ace Worldwide	2700 E 28th St Ste 120	Minneapolis
American Swedish Institute	2600 Park Ave S	Minneapolis
The 614 Co	81 9th St S Ste 410	Minneapolis
Hopf and Hopf Printing	2711 East Franklin Avenue	Minneapolis
New French Bakery - Minneapolis	2609 26th Ave S	Minneapolis
H&B Elevators Inc	2629 30th Ave S	Minneapolis
Marlin Oil Co	721 E Lake St	Minneapolis

TABLE D1 - WHAT'S IN MY NEIGHBORHOOD, LEVEL 0, ALL SITES		
Industrial Chemical Labs Inc	2301 E 25th St	Minneapolis
Kaplan Brothers Inc	1414 18 24 E Lake St	Minneapolis
Blaisdell Properties Inc	3808 Blaisdell Ave S	Minneapolis
Superamerica #4232	3453 Nicollet Ave S	Minneapolis
Fire Station #6	121 E 15th St	Minneapolis
City Of Mpls Equipment Services Garage	1308 Currie Ave	Minneapolis
Lee Rademacher - #52-9652-107	3025 E Franklin Ave	Minneapolis
Sidal Realty Co	2201 Blaisdell Ave S	Minneapolis
Bethlehem Baptist Church	720 13th Ave S	Minneapolis
Individual Building	2525 Harriet Ave S	Minneapolis
Fire Station #17	821 E 35th St	Minneapolis
Phillps Community School	2300 Chicago Ave	Minneapolis
Vision Loss Resources	1936 Lyndale Ave S	Minneapolis
Lowe House	143 E 19th St	Minneapolis
Minnegasco River Plant/cedar Propane	2 Cedar Ave S	Minneapolis
Amoco Ss #5050	3601 Nicollet Ave	Minneapolis
Andrew Residence Management Inc	1215 S 9th St	Minneapolis
Fifth Ave High Rise	2419 5th Ave S	Minneapolis
Jadco Supply	2827 S 20th Ave	Minneapolis
Franklin Towers	1920 4th Ave S	Minneapolis
Hennepin County Medical Center Parking	626 Park Ave	Minneapolis
Juvenile Justice Center	626 S 6th St	Minneapolis
Saint Albert The Great School	2836 33rd Ave S	Minneapolis
Bolander Construction Yard	206 Elroy St	Minneapolis
Holiday Stationstore #2	2124 E Franklin Ave	Minneapolis
Holiday Stationstore #41	1024 E 38th St	Minneapolis
Holiday Stationstore #209	2448 Hennepin Ave	Minneapolis
Apartment Building	3500 Dupont Ave	Minneapolis
Formerly Fritzs Service	2802 Bloomington Ave S	Minneapolis
Apartment Building	3217 14th Ave S	Minneapolis
Stimson Building	704 Hennepin	Minneapolis
Midwest Restaurant Seating	2607 Bloomington Ave S	Minneapolis
Caafe Hangen Dazs	3024 Hennepin Ave	Minneapolis
Western Waterproofing Co Inc	2838 Stevens Ave	Minneapolis
SuperAmerica 4378	2445 Bloomington Ave S	Minneapolis
Allied Parking	517 Hennepin Ave	Minneapolis
Benson Parking Service Inc	900 3rd Ave S	Minneapolis
Old Greyhound Bus Depot	29 N 7th St	Minneapolis
Executive Parking Lot - Block 74	NW Corner of 5th St & Park Ave	Minneapolis
Signal Systems Inc	2210 4th Ave S	Minneapolis
Pheoll Manufacturing Of Mn	1313 Chestnut Ave N	Minneapolis
Stevens Square	101 E 32nd St	Minneapolis
University of MN Medical Center Fairview	608 25th Ave	Minneapolis
510 Groveland Associates	510 Groveland Ave	Minneapolis
Us West Switching Station	3317 24th Ave S	Minneapolis
Clausens Oil Co	22 E Franklin Ave S	Minneapolis
Mpls Auditorium & Convention Hall	1403 Stevens Ave S	Minneapolis

TABLE D1 - WHAT'S IN MY NEIGHBORHOOD, LEVEL 0, ALL SITES		
Amoco Ss #5258	1934 Nicollet Ave	Minneapolis
Minneapolis Moto Mart	3301 Hiawatha	Minneapolis
Oak Grove Towers	215 Oak Grove St	Minneapolis
Seward Towers East	2910 E Franklin	Minneapolis
Lydia Apts/lasalle Conval Home	1920 LaSalle Ave S	Minneapolis
Walker Place	3701 Bryant Ave S	Minneapolis
Charles L Horn Towers	115 W 31st St	Minneapolis
Atrium Apartments	314 Hennepin Ave	Minneapolis
Signe Burckhardt Manor	2533 1st Ave S	Minneapolis
Hiawatha Towers Apartment	1700 E 22nd St	Minneapolis
MPHA Apartment Building	1515 Park Ave S	Minneapolis
Uptown Auto	53 Glenwood Ave N	Minneapolis
Football Complex	600 15th Ave SE	Minneapolis
Hobart Inc	2425 Minnehaha Ave S	Minneapolis
Wishart Robert I Building	2636 Portland Ave S	Minneapolis
Mn/dot - Old Hawthorne Shop	88 Glenwood Ave	Minneapolis
Franklin Business Center	1422 E Franklin Ave	Minneapolis
Cleared Public Property	7th & Holden (ne Corner)	Minneapolis
Armour Security	2601 Stevens Ave S	Minneapolis
Lake Country Schools	3749 Pleasant Ave S	Minneapolis
Philip Wagenstien Bldg/health Sci (b/c)	516 Delaware St SE	Minneapolis
Park & Lake Car Wash	637 E Lake St	Minneapolis
Norwest Bank-lake St	3030 Nicollet	Minneapolis
Buckingham Apartments (the)	1500 La Salle	Minneapolis
Barlow Building	2716 E Lake St	Minneapolis
Mount Olive Lutheran Church	3045 Chicago Ave	Minneapolis
Minnehaha Courts	1901 Minnehaha Ave	Minneapolis
Chef Cafe	806 Franklin Ave E	Minneapolis
Carlson Hall-north Central Univ	916 E 15th St	Minneapolis
Cedar Lake Apartment	3121 Cedar Ave S	Minneapolis
Christ The King School	3210 W 51st St	Minneapolis
Clara Doerr Club	1717 2nd Ave	Minneapolis
Kate Dunwoody Hall	52 S 10th St	Minneapolis
Honeywell	Honeyell Plz	Minneapolis
Central Lutheran Church	333 S 12th St	Minneapolis
Pillsbury Manor	2435 Pillsbury Ave S	Minneapolis
Suns Cleaners	1111 Hennepin Ave	Minneapolis
Sternfels & Co	1622 Park Ave	Minneapolis
Stanley Hall Court Apartments	2108 Pleasant	Minneapolis
Twin Court Apartments	611 W Ridgewood	Minneapolis
Best Apts	2008 Park Ave S	Minneapolis
Cedar Small Engine	3804 Cedar Ave S	Minneapolis
Cedar Lake Car Wash	1704 E Lake St	Minneapolis
Bristol Apartments	2500 Blaisdell Ave	Minneapolis
Allianz Insurance Building	1750 Hennepin Ave	Minneapolis
Washington Square Apartments	1807 Washington Ave S	Minneapolis
Crosstown Sweeping Corp	3445 Hiawatha Ave	Minneapolis



TABLE D1 - WHAT'S IN MY NEIGHBORHOOD, LEVEL 0, ALL SITES		
Old Pillsbury Mansion	100 E 22nd St	Minneapolis
University Of Saint Thomas	1000 Block of Harmon & LaSalle	Minneapolis
Apartment Bldg	1801 LaSalle Ave	Minneapolis
Fredrickson Residence	4741 Emerson Ave S	Minneapolis
Dain Bosworth Plaza	60 S 6th St	Minneapolis
Augustana Lutheran Church	704 11th Ave S	Minneapolis
Fifth Street Bridge Site	300 N 5th St	Minneapolis
Bush Terrace Condominiums	4017 14th Ave S	Minneapolis
Inter City Oil #95	2325 E 38th St	Minneapolis
Louis Court	1125 Harmon Pl	Minneapolis
Olson David Sales	2504 25th St E	Minneapolis
North American Eng & Mfg Inc	2500 25th St E	Minneapolis
Yvonne Pearson	2444 Bryant S	Minneapolis
Grossman Chevrolet	1310 E Lake St	Minneapolis
Greystone Apartments	1785 Bryant Ave S	Minneapolis
Salem Lutheran Church	610 W 28th St	Minneapolis
Alex Used Cars	1619 Chicago Ave S	Minneapolis
Uptown Office Park	3255 Hennepin Ave	Minneapolis
Fair Oaks Motel	2335 3rd Ave S	Minneapolis
Top Quality Auto	3450 Lyndale Ave S	Minneapolis
Norm's Cleaners	2835 W Hennepin Ave	Minneapolis
Four Seasons Car Wash Inc	2900 Nicollet Ave	Minneapolis
Central Design Supply	3433 E 25th St	Minneapolis
Cottle Properties	127 W Lake St	Minneapolis
Eighth Street Railroad Coachyard	Cedar Ave & 8th St	Minneapolis
University Of Minnesota	100 Shops Bldg 319 15th Ave SE	Minneapolis
Formerly Service Station	1220 W Lake St	Minneapolis
Booth Manor	1421 Yale St	Minneapolis
Augsburg College	725 23rd Ave S	Minneapolis
Apartment Building	1501 LaSalle Ave S	Minneapolis
Dupont Villa	3421 Dupont Ave S	Minneapolis
Dupont Villa	3451 Dupont Ave S	Minneapolis
Clean N Press	3007 Lyndale Ave S	Minneapolis
Apartment Complex	1917 Stevens Ave S	Minneapolis
Irvine Place Apartments	3030 Irvine Ave S	Minneapolis
Weber Apartments	4253 Weber Pkwy	Minneapolis
Park Avenue United Methodist Church	3400 Park Ave S	Minneapolis
Symphony Place Apartments	1117 Marquette Ave	Minneapolis
Inner City Church	1812 Park Ave S	Minneapolis
Hotel Luxeford Suites	1101 LaSalle Ave	Minneapolis
Hums Liquor	2126 Lyndale Ave S	Minneapolis
Nicollet Towers	1350 Nicollet Mall	Minneapolis
Park Plaza Apartments	505 527 Humboldt Ave N	Minneapolis
U Of Mn Basic Sciences Building	312 Church St SE	Minneapolis
Nico Plating Company	2932 Stevens Ave S	Minneapolis
Former Labousky Property	1525 E Franklin Ave	Minneapolis
University Court Apartments	1414 S 3rd St	Minneapolis

TABLE D1 - WHAT'S IN MY NEIGHBORHOOD, LEVEL 0, ALL SITES		
Cathedral Church Of Saint Mark	519 Oak Grove St	Minneapolis
Special Education Center	2600 Grand Ave S	Minneapolis
Holiday Inn Express	225 S 11th St	Minneapolis
CSC Property LLC/American Express Client	901 3rd Ave S	Minneapolis
Manangement And Economics Building	271 19th Ave S	Minneapolis
19th Avenue Parking Ramp	300 19th Ave S	Minneapolis
Marquette Place Apartments	1314 Marquette	Minneapolis
Native American Indian Center	1530 E Franklin Ave	Minneapolis
Mount Curve Apartments	1710 Bryant Ave	Minneapolis
Hennepin County Safty Facility	321 5th Ave S	Minneapolis
Meci Convention Center Plant	125 W 15th St	Minneapolis
Baker Plant	706 2nd Ave S	Minneapolis
Valvoline Rapid Oil Change	2401 Hennepin Ave S	Minneapolis
Equipment Services Garage	1217 W Lake St	Minneapolis
Di Hed Yokes	3023 Snelling Ave S	Minneapolis
718 North Washington Avenue Building	718 N Washington Ave	Minneapolis
Autopia	2311 Hennepin Ave S	Minneapolis
Miller Towing Inc	2935 Pleasant Ave S	Minneapolis
Essex Building	84 S 10th St	Minneapolis
University Of Minnesota Mayo Building	420 Delaware St S E	Minneapolis
Hiawatha Towers Apartments	2019 16th Ave S	Minneapolis
City Of Minneapolis 3rd District	121 Glenwood Ave N	Minneapolis
Cedar High Apartments	630 Cedar Ave S	Minneapolis
Roof Depot Inc	1860 E 28th St	Minneapolis
Centerpoint Energy-groundwater Trtmt	1309 W River Pkwy	Minneapolis
Jacobs Trading Company	80 S 8th St #2900	Minneapolis
Cedar 94 Apartments	2220 E Franklin Ave	Minneapolis
Suburban World Theatre	3022 Hennepin Ave	Minneapolis
Block E Parking Lot	1st Ave N 6th Ave Hennepin	Minneapolis
Metrodome Square Building	1010 S 7th St	Minneapolis
Eiethe Womans Club Of Minneapolis	410 Oak Grove St	Minneapolis
Erban Ventures	2801 4th Ave S	Minneapolis
Dunbar Armored Shop	3026 Minnehaha Ave	Minneapolis
Ing	100 Washington Ave S Ste 1306	Minneapolis
Sons Of Norway	1455 W Lake St	Minneapolis
Minneapolis Public Library	300 Nicollet Mall	Minneapolis
University Of Mn Molecular/cell	420 SE Washington Ave	Minneapolis
Mn Council Of Churches	122 Franklin Ave W	Minneapolis
Wells Fargo Home Mortgage	2710 5th Ave S	Minneapolis
Redevelopment Property	1014 E Franklin Ave	Minneapolis
Old Gas Station	1000 24th St E	Minneapolis
Ids Center	80 S 8th St	Minneapolis
Richard Davis Residence	1325 Mt Curve Ave	Minneapolis
Thresher Square	708 S 3rd St	Minneapolis
Commercial Retail Property	2570 Nicollet Ave S	Minneapolis
Mpls Garage (city of) Equip Serv - 1315	1315 Currie Ave	Minneapolis
Soo Line RR dba Canadian Pacific Railway	See location description	Minneapolis

TABLE D1 - WHAT'S IN MY NEIGHBORHOOD, LEVEL 0, ALL SITES		
TCF Tower Building	121 S 8th St	Minneapolis
Glacier Park Co	401 N 7th St	Minneapolis
Latter Day Saints Vacant Lot	3901 Nicollet Ave S	Minneapolis
Sears Store	900 E Lake St	Minneapolis
City Block	10th & 11th Harmon & LaSalle	Minneapolis
Comets	3639 Park Ave S	Minneapolis
United Methodist Church Parsonage	525 Groveland Ave	Minneapolis
Soo Line RR d.b.a Canadian Pacific Railw	See location description	Minneapolis
Apartment Complex	125 Oak Grove St	Minneapolis
Opus Minnesota Technology Center	1100 Washington Ave S	Minneapolis
Loring Car Wash	2201 Lyndale Ave	Minneapolis
Former Whiteway Cleaners	26th St W & Stevens Ave (sw Corner)	Minneapolis
Fairview Riverside Hospital	2450 Riverside Ave	Minneapolis
Lagoon Cinema	1320 Lagoon Ave	Minneapolis
Awards Of America	3408 E Lake St	Minneapolis
Good Choice Grocery	2746 Blaisdell Ave S	Minneapolis
Fantasy House	2955 Lyndale Ave S	Minneapolis
Former Shapiro Cleaners	2628 Franklin Ave E	Minneapolis
Loon Grocery	2501 Lyndale Ave S	Minneapolis
Park Plaza Apartments	(olson Memorial Highway)	Minneapolis
Urban Ventures	3040 4th Ave S	Minneapolis
Berg Residence	1767 Irving Ave S	Minneapolis
Semple Mansion Carriage House	100 W Franklin Ave	Minneapolis
Vacant Warehouse	2717 E 33rd St	Minneapolis
Hossman Library	347 E 36th St	Minneapolis
Western Waterproofing	2838 Stevens Ave	Minneapolis
International Design Center	100 S 2nd Ave	Minneapolis
Zeller Property	2101 21st Ave S	Minneapolis
Hud Home	3717 24th Ave S	Minneapolis
Hennepin Country Medical Center	8th Ave & Chicago	Minneapolis
Plymouth Office Building	12 S 9th St	Minneapolis
Lowe Home	110 E 19th St	Minneapolis
Wyman Building	110 5th St N	Minneapolis
Bernie And Jims Service Station	1024 Portland Ave S	Minneapolis
Fung Building	2532 Nicollet Ave S	Minneapolis
Former Mann Theater	700 S Hennepin Ave	Minneapolis
Wrecker Services	188 1 2 Glenwood Ave N	Minneapolis
Former Petrick Building	2548 Nicollet Ave S	Minneapolis
Nsp Chestnut Facility	1508 Chestnut Ave	Minneapolis
Chestnut Service Center Garage Nsp	99 N 16th St	Minneapolis
Zanner Property	3309 Park Ave	Minneapolis
Mcda Site	4th St & Kirby Puckett Way	Minneapolis
River Gate Apartments	115 2nd Ave	Minneapolis
3017 Residential Property	3017 28th Ave S	Minneapolis
Aljon Tool Inc	907 To 909 Portland Ave S	Minneapolis
Superamerica #4394	2325 Lyndale	Minneapolis
Former Service Station/whittier Cdc	2554 Blaisdell Ave	Minneapolis

TABLE D1 - WHAT'S IN MY NEIGHBORHOOD, LEVEL 0, ALL SITES		
Chicago-milwaukee Corp/rollins Oil Co	2000 2020 E 28th St	Minneapolis
Quad Home	2815 Hennepin Ave	Minneapolis
Straughan Hardware	2200 to 2204 E 25th St	Minneapolis
Lrt Construction Site Lake Street	NW Quadrant Of Lake St & Lrt	Minneapolis
Crawford Home Development	3502 E 25th St	Minneapolis
Scheele Property	1849 E 38th St	Minneapolis
Carlson School Expansion Site	1901 4th St SE	Minneapolis
Burnstein Property	2823 Franklin Ave E	Minneapolis
CP 9754-SP 027-603-035	See location description	Minneapolis
Hennepin Family Care East Lake	2700 E Lake St Ste 1100	Minneapolis
Vacant Building	3641 Chicago Ave S	Minneapolis
Zenith and Aloft	See location description	Minneapolis
2700 East 28th LLC	2700 E 28th St Ste 120	Minneapolis
Former Gas Station	1931 Minnehaha Ave	Minneapolis
Brekke Properties	See location description	Minneapolis
Parade Stadium - Athletic Field - CSW	400 Kenwood Parkway	Minneapolis
Knox Jewelers	2921 Lyndale Ave S	Minneapolis
LDIC an HFA Facility	120 S 6th St Ste 155	Minneapolis
HFA Addiction Medicine Clinic	807 Park Ave	Minneapolis
HFA Senior Care Clinic	1425 10th Ave S	Minneapolis
U of M Physicians Dental Clinic	606 24th Ave S Ste 200	Minneapolis
Frana Job Site	2936 Aldrich Ave S	Minneapolis
Mack Engineering Corp - Building I	3215 E 26th St	Minneapolis
Little Earth IV - CSW	See location description	Minneapolis
TCF Bank Stadium Infrastructure-BP 4-CSW	See location description	Minneapolis
Hope Community Property	1931 Portland Ave S and E Franklin	Minneapolis
Franklin Steele Commons Project	See location description	Minneapolis
2900 Aldrich - CSW	2900 Aldrich Ave	Minneapolis
JPM Properties	3008 Hennepin Ave S	Minneapolis
Commercial Non-Homestead	2833 Lyndale Ave S	Minneapolis
MoZaic Mixed Use Development - CSW	See Location Description	Minneapolis
Windsor Apartments	2011 3rd Ave S	Minneapolis
MNDOT I35W Bridge	See location description	Minneapolis
St Alberts School	3210 E 29th St	Minneapolis
ADM Milling Co - Nokomis Flour Mill	3501 Hiawatha Ave	Minneapolis
Bituminous Roadways - Minneapolis	2825 Cedar Ave S	Minneapolis
901 Marquette Building	901 Marquette Ave	Minneapolis
A & A Plate Service Inc	1113 Washington Ave S	Minneapolis
Aardvark Graphics	3011 27th Ave S	Minneapolis
O'Reilly Automotive 1976	3536 Nicollet Ave S	Minneapolis
Acme Awning	3206 Bloomington Ave	Minneapolis
AJ Johnson Co	111 Washington Ave N	Minneapolis
Aldy Graphic Supply Inc	1115 Hennepin Ave	Minneapolis
Alevizos J H DDS	3023 Chicago Ave	Minneapolis
Allergy & Asthma Specialists - Mpls	825 Nicollet Mall Ste 1149	Minneapolis
Allied Parking Inc	400 Marquette Ave	Minneapolis
Alphagraphics - Minneapolis	825 Hennepin Ave	Minneapolis

TABLE D1 - WHAT'S IN MY NEIGHBORHOOD, LEVEL 0, ALL SITES

Alternator Rebuild Co Inc	110 E Lake St	Minneapolis
Am Graphics	206 N 3rd St	Minneapolis
American Engraving Inc	529 7th St S Ste 667	Minneapolis
Amigo Service Center - 3544 Lyndale	3544 Lyndale Ave S	Minneapolis
Ams Packaging Inc	3249 Snelling Ave	Minneapolis
Andrus Publishing Inc	615 S 7th St	Minneapolis
Applied Environmental Sciences Inc	511 11th Ave S Ste 251	Minneapolis
Architectural Alliance	400 Clifton Ave	Minneapolis
Arndt Photography Inc	400 1st Ave N Ste 510	Minneapolis
Artcraft Press Inc	610 10th St S	Minneapolis
Arthritis Association Of Mn	63 S 9th St Ste 711	Minneapolis
Associated Bioscience Inc	1552 E Lake St	Minneapolis
At&T Long Lines	420 3rd Ave S	Minneapolis
Atlantic Press Inc	3457 Chicago Ave	Minneapolis
Augsburg Publishing House	426 S 5th St	Minneapolis
Top Gear Autoworks	2401 E Lake St	Minneapolis
Autopia	2311 Hennepin Ave	Minneapolis
Bach Wendy Z DDS	825 Nicollet Mall Ste 425	Minneapolis
Baker Bearing Company	2515 26th Ave S	Minneapolis
Ballentine Vfw Post 246	2916 Lyndale Ave S	Minneapolis
Ballin Richard A Dds	825 Nicollet Mall Ste 1531	Minneapolis
Manley Cycle - Harriet Ave	2845 Harriet Ave S Ste 113	Minneapolis
Bernie & Jims Amoco	300 S 10th St	Minneapolis
Bick Edward R DDS PA	3005 Holmes Ave	Minneapolis
Big Work	131 E 26th St	Minneapolis
Bituminous Roadways - Longfellow Ave	2828 Longfellow Ave S	Minneapolis
Blacks Photography 810	180 Pillsbury Center	Minneapolis
Ritz Camera 368	40 7th St S	Minneapolis
Blake Upper School	511 Kenwood Pkwy	Minneapolis
Bloomington Lake Chiropractic	3105 Bloomington Ave	Minneapolis
Bloomington Lake Dental Clinic	3042 Bloomington Ave	Minneapolis
Blue Ribbon Cleaners	3148 Hennepin Ave	Minneapolis
Douglas E Bong DDS	2213 E 38th St	Minneapolis
Bioscrip	2100 Lyndale Ave S	Minneapolis
Mat's Auto Repair	1111 E Lake St	Minneapolis
Bryant Auto Repair	1716 E Lake St	Minneapolis
Budget Rent A Car Corp	1101 E Lake St	Minneapolis
Burdick Grain Co	730 2nd Ave S Ste 1400	Minneapolis
Bureau Of Eng Site Hennepin Cty	502 S 4th St	Minneapolis
Butler Square United Properties	100 N 6th St Ste 220C	Minneapolis
Calhoun Car Store	2947 Girard Ave S	Minneapolis
Brito Auto Paint LLC	3013 Pillsbury Ave S	Minneapolis
Car X Muffler Shops - Minneapolis	1001 W Lake St	Minneapolis
Carmicael Lynch Advertising Inc	800 Hennepin Ave	Minneapolis
CenterPoint Energy - GWTF	1300 River Pkwy W Ste A	Minneapolis
Cedar Cycle & Fitness	3750 Cedar Ave S	Minneapolis
Charnley Steve	3105 Garfield Ave	Minneapolis

TABLE D1 - WHAT'S IN MY NEIGHBORHOOD, LEVEL 0, ALL SITES		
Sexton Building	529 S 7th St	Minneapolis
Childrens Dental Services	1098 Andersen Ln	Minneapolis
Kwong Tung Foods Inc	1840 E 38th St	Minneapolis
Chv & Co	2344 Nicollet Ave	Minneapolis
City Graphics Inc	1825 Chicago Ave	Minneapolis
Clydes Service	1400 E 38th St	Minneapolis
Community Hospital Linen Service	201 Royalston Ave	Minneapolis
Consulting Radiologists Ltd	710 E 24th St Ste 700	Minneapolis
Consulting Radiologists Ltd	920 E 28th St Ste 240	Minneapolis
Copies Inc	2922 Bryant Ave S	Minneapolis
Johnson & DeChant DDS PA	121 S 8th St Ste 150	Minneapolis
Cycle Goods	2801 Hennepin Ave	Minneapolis
Dahl & Curry Co Inc	1320 Yale Pl	Minneapolis
Dahlberg Limousine Service	3014 Lyndale Ave S	Minneapolis
EDMC - Art Institutes Int MN	15 S 9th St	Minneapolis
Dis Specialties	3013 Lyndale Ave S	Minneapolis
Our Saviors Housing	2219 Chicago Ave	Minneapolis
Downtown Internal Medicine Consul	825 Nicollet Mall Ste 507	Minneapolis
Downtown Orthopedics Pa	90 S 9th St Ste 200	Minneapolis
Dragnet	119 N 4th St Ste 405	Minneapolis
DF Countryman Co	2425 E 26th St	Minneapolis
East End Imports	2801 E Franklin Ave	Minneapolis
East Lake Collison	2111 E Lake St	Minneapolis
Nicollet Auto Services	3611 Nicollet Ave S	Minneapolis
Moka Pharmacy	1515 E Franklin Ave	Minneapolis
Electric Service Co	1609 Chicago Ave	Minneapolis
Elite Cleaners & Launderers	3101 Minnehaha Ave	Minneapolis
Firestone Tire & Rubber - Harmon Place	1107 Harmon Pl	Minneapolis
First Avenue Medical Clinic	2645 1st Ave S	Minneapolis
Zeller Realty Corp	120 S 6th St Ste 1700	Minneapolis
First Unitarian Society	900 Mount Curve Ave	Minneapolis
WD Forbes Co Inc	129 6th Ave SE	Minneapolis
Fort Automobile Contracting	1312 E Lake St	Minneapolis
Franklin Amoco	2000 3rd Ave S	Minneapolis
Fritz Freeway Gas	2800 Bloomington Ave	Minneapolis
The Garage	2913 Harriet Ave	Minneapolis
General Repair Service	2521 24th Ave S	Minneapolis
Auto-Mate GTC	3541 Cedar Ave S	Minneapolis
Gerst Barry D DDS PA	2701 Nicollet Ave	Minneapolis
GFI America	2815 Blaisdell Ave	Minneapolis
Richard W Gould DDS	825 Nicollet Mall Ste 1233	Minneapolis
Grand Metropolitan	200 S 6th St Ste 23X3	Minneapolis
Graphic Systems Inc	100 Portland Ave	Minneapolis
Graphic Systems Inc	2632 26th Ave S	Minneapolis
Green Auto & Mechanic	3009 Clinton Ave	Minneapolis
Guy Am Auto Service	2938 5th Ave S	Minneapolis
Walgreen's Store 1737	200 W Lake St	Minneapolis



TABLE D1 - WHAT'S IN MY NEIGHBORHOOD, LEVEL 0, ALL SITES		
Hanks Photographic Services Inc	27 N 4th St Ste 500	Minneapolis
Healtheast Transportation	2900 Pleasant Ave	Minneapolis
Heng 1 Hour Photo Inc	2750 Nicollet Ave S Ste 120	Minneapolis
Hennepin Avenue United Methodist	511 Groveland Ave	Minneapolis
Hennepin County Chemical Dependency Ctr	1800 Chicago Ave	Minneapolis
Hennepin County Family Medical Center	5 W Lake St	Minneapolis
Hennepin County Main Welfare	400 S 5th St	Minneapolis
Hennepin County Medical Center	701 Park Ave S	Minneapolis
Franklin Lofts LLC	111 Franklin Ave E Ste MC625	Minneapolis
Hennepin County Regional RR Authority	823 17th Ave S	Minneapolis
Hennepin County Sheriff's Office	626 S 6th St	Minneapolis
Halvey's Body Shop	3527 Chicago Ave	Minneapolis
Henry Birks Jewelers	330 2nd Ave S Ste 450	Minneapolis
James D Hera DDS - Ste 801	825 Nicollet Mall Ste 801	Minneapolis
James D Hera DDS	825 Nicollet Mall Ste 711	Minneapolis
Hi Lake Auto Repair	2121 E Lake St	Minneapolis
Hirshfield's - Minneapolis	325 Lake St E	Minneapolis
Holly Sales & Service Inc	1815 E 41st St	Minneapolis
Hopf & Hopf Printing Inc	2711 E Franklin Ave	Minneapolis
Horecki Henry Md	90 S 9th St Ste 318	Minneapolis
Humphrey Radiator Service	48 S 12th St	Minneapolis
Hydraulic Jack & Equipment Service Corp	2601 Aldrich Ave S	Minneapolis
Ids Center	80 S 8th St Ste 3450	Minneapolis
Indian Health Board of Minneapolis	1315 E 24th St	Minneapolis
Industrial Electric Company	600 S 9th St	Minneapolis
Ingman Laboratories Inc	2945 34th Ave S	Minneapolis
Isles Dental Dr Raij	2534 Hennepin Ave	Minneapolis
J Michaels Co	2608 1st Ave S	Minneapolis
Janesville Auto Transport Co	2700 26th Ave S	Minneapolis
Jc Penney Building Towle	605 Nicollet Mall	Minneapolis
Johns Auto Body	816 Park Ave	Minneapolis
Johnson David W Jr Dds	736 E 27th St	Minneapolis
Johnstech International	511 11th Ave S	Minneapolis
D&T Auto Repair Garage	3446 Bloomington Ave S	Minneapolis
Jr Import Service Inc	3700 Chicago Ave	Minneapolis
Kenwood Chiropractic Arts	1311 W 25th St	Minneapolis
Kevins Amoco	3800 Bloomington Ave	Minneapolis
Key Group Advertising	501 S 8th St	Minneapolis
King Ronald L Dds	1201 Lagoon Ave	Minneapolis
Kingston Robert J Dds	825 Nicollet Mall Ste 939	Minneapolis
Kinkos Of Minnesota Inc Kinkos Copies	3028 Hennepin Ave	Minneapolis
Kitty Clinic	3447 Lyndale Ave S	Minneapolis
Paul Klausen DDS - 821	821 Marquette Ave Ste 1802	Minneapolis
Kmart Store 3405	10 W Lake St	Minneapolis
Tim J Clavin DDS	825 Nicollet Mall Ste 609	Minneapolis
Kolstad Bros Automotive - 12th Ave	2940 12th Ave S	Minneapolis
Kosmoski Specialty Company	2521 1/2 27th Ave S	Minneapolis

TABLE D1 - WHAT'S IN MY NEIGHBORHOOD, LEVEL 0, ALL SITES		
Lakemaps Inc	3755 Bloomington Ave	Minneapolis
Landry Transfer Inc	2515 23rd Ave S	Minneapolis
Langford Tool & Drill	1125 Washington Ave S	Minneapolis
Fifth Street Owner Corp	150 5th St S	Minneapolis
Lathrop Paint Supply Co Inc	2741 Hennepin Ave	Minneapolis
Laurel Village	1200 Hennepin Ave	Minneapolis
Lavin Company	2900 Aldrich Ave S	Minneapolis
Lehmann Center	1006 W Lake St	Minneapolis
Lens Antiques	1108 E Lake St	Minneapolis
Litho Color Plate Inc	1229 Harmon Pl	Minneapolis
Longfellow Minneapolis Schools	3017 E 31st St	Minneapolis
Loring Cleaners	21 W 15th St	Minneapolis
Lowell's Body Shop Supply	211 W Lake St	Minneapolis
Ludvigsons Al Standard	3551 Lyndale Ave S	Minneapolis
Lund Building Maintenance Company	2525 E Franklin Ave	Minneapolis
Lyndale Auto Service	2809 Lyndale Ave S	Minneapolis
Mall Liquors Inc	46 S 6th St	Minneapolis
Marriott Hotel City Center	30 S 7th St	Minneapolis
Martin E E III DDS	825 Nicollet Mall Ste 431	Minneapolis
Marynak Deborah L	825 Nicollet Mall Ste 210	Minneapolis
Mccormack Robert Dds	825 Nicollet Mall Ste 929	Minneapolis
Meridel Le Sueur Center	1929 S 5th St	Minneapolis
Merit Printing	117 N 2nd St	Minneapolis
Metro Dentalcare - Lake Street	2510 E Lake St	Minneapolis
Metz Baking Co	912 E 24th St	Minneapolis
Meyer Offset Printing Inc	2920 Bryant Ave S	Minneapolis
Midas Muffler Lake St	601 E Lake St	Minneapolis
Midwest Group One	2645 26th Ave S	Minneapolis
Midwestern Machinery Co - Pleasant Ave	2848 Pleasant Ave	Minneapolis
Miller Meester Adv	17 N Washington Ave	Minneapolis
Miller Towing	2935 Pleasant Ave	Minneapolis
David's Auto Repair	4000 Bloomington Ave S	Minneapolis
Children's Health Care Hospital/Clinics	2525 Chicago Ave S	Minneapolis
Minneapolis city of	309 2nd Ave S	Minneapolis
Minneapolis Fire Department Stores	1858 E 27th St	Minneapolis
Minneapolis City Of Jobs & Training Bldg	312 2nd Ave S	Minneapolis
Minneapolis City Of Municipal Garage	1219 W Lake St	Minneapolis
Minneapolis College Of Art & Design	2501 Stevens Ave	Minneapolis
Minneapolis Community Development Agency	NW Corner Of W Rvr Pkwy/4th Av	Minneapolis
Minneapolis Enameling Grand Ave	2842 Grand Ave S	Minneapolis
USPS Mpls Process/Dist/Main Post Office	100 S 1st St	Minneapolis
Allina Medical Clinic - Nicollet Mall	825 Nicollet Mall Ste 300	Minneapolis
Minneapolis Medical Research - Portland	519 Portland Ave	Minneapolis
Minneapolis Schools Lyndale	3333 Grand Ave S	Minneapolis
Minneapolis Schools Wilder	3320 Elliot Ave	Minneapolis
CenterPoint Energy - River	1240 River Pkwy W	Minneapolis
Minnesota Council Of Churches	122 W Franklin Ave Ste 100	Minneapolis



TABLE D1 - WHAT'S IN MY NEIGHBORHOOD, LEVEL 0, ALL SITES		
Minnesota Department of Health	717 Delaware St SE	Minneapolis
Minnesota Diagnostic Center	910 E 26th St Ste LL10	Minneapolis
Minnesota Metal Finishing Inc - Snelling	3222 Snelling Ave	Minneapolis
Minnesota Specialty Co	119 N 4th St	Minneapolis
Modern Cleaners & Dyers Inc	3200 Chicago Ave	Minneapolis
Mpls Municipal Ramp Maintenance	318 2nd Ave N	Minneapolis
Murphy Design Inc	119 N 4th St Ste 201	Minneapolis
Nevens Cleaners	19 S 1st St	Minneapolis
Nevens Co Cleaners & Launderers	Multifoods Bldg	Minneapolis
Nicollet Hardware	3805 Nicollet Ave	Minneapolis
Nicollet Historic Associates	230 238 Nicollet Mall	Minneapolis
Nokomis Bowling Lanes	4040 Bloomington Ave	Minneapolis
Nokomis Dental Center	4110 Cedar Ave S	Minneapolis
Nordquist Holdings LLC dba Nordquist Sign Co	312 W Lake St	Minneapolis
Ann L Norrlander DDS	825 Nicollet Mall Ste 1553	Minneapolis
North American Carrousel	2804 27th Ave S	Minneapolis
Northern Imprints & Embroidery	1915 Hiawatha Ave	Minneapolis
Northstar Chiropractic Clinic	625 Marquette Ave Ste 223	Minneapolis
Northstar Woolen	109 Portland Ave	Minneapolis
Northwest Post & Transfer	81 S 9th St Ste 240	Minneapolis
Northwest Process Equipment Inc	4005 15th Ave S	Minneapolis
Norwest Bank Chicago Lake Na	809 E Lake St	Minneapolis
Multi Tenant Commercial Building	3045 Hennepin Ave	Minneapolis
NWC Limited Partnership	90 S 7th St	Minneapolis
Oak Grove Chiropractic Clinic	430 Oak Grove St Ste B1	Minneapolis
Oanes 66 Service	1200 Bloomington Ave S	Minneapolis
Oas Auto Body & Paint Shop	215 W 29th St	Minneapolis
Opus Corp Powers Building	430 Marquette Ave	Minneapolis
Orbex Inc	620 S 8th St	Minneapolis
Riverside Surgery Clinic	606 24th Ave S Ste 119	Minneapolis
Orthopaedic Consultants Pa - 9th St	74 9th St S Ste 711	Minneapolis
Osman Cleaner	2500 Hennepin Ave	Minneapolis
Intermaco Inc - Mpls	2943 Park Ave S	Minneapolis
Portland Lake Motors/Customs Body Repair	3005 5th Ave S	Minneapolis
Peerless Machine Products Co Inc	2828 21st Ave S	Minneapolis
Penn Cycle Shops Inc - Minneapolis	710 W Lake St	Minneapolis
Hennepin County Environmental Serv PPL	509 Washington Ave S	Minneapolis
Peter Pan Cleaners	322 W 38th St	Minneapolis
Photo Lab Corp	817 Portland Ave	Minneapolis
Physicians & Surgeons Bldg	59 S 9th St	Minneapolis
Pillsbury Bp/Fs Tech Center	425 Main St SE	Minneapolis
Portland Car Care	1928 Portland Ave	Minneapolis
Precision Tune	2217 Nicollet Ave	Minneapolis
Proex Photo & Portrait 1531	2917 26th Ave S	Minneapolis
Proex Photo 1534	527 Marquette Ave S	Minneapolis
Professional Assoc of Internal Medicine	825 Nicollet Mall Ste 953	Minneapolis
Prosper Industries Inc	3017 4th Ave S	Minneapolis

TABLE D1 - WHAT'S IN MY NEIGHBORHOOD, LEVEL 0, ALL SITES		
Public Land/Private Lot	1727 Lasalle Ave	Minneapolis
Railway Material	600 SE Main St	Minneapolis
RC Painting Inc Warehouse	3214 Snelling Ave	Minneapolis
Dr Michele Reynolds	825 Nicollet Mall Ste 911	Minneapolis
Rheumatology Associates	825 Nicollet Mall Ste 853	Minneapolis
Riteway Motor Parts Inc	160 Glenwood Ave	Minneapolis
Riverside University Family Practice	2615 E Franklin Ave	Minneapolis
Riverside Plaza	1610 S 6th St	Minneapolis
Roland Mill Work Company	2836 Lyndale Ave S	Minneapolis
S & D Cleaners Inc	1110 Lagoon Ave	Minneapolis
Sams Shop	2901 E 34th St	Minneapolis
Samuel Bingham Co	900 S 3rd St	Minneapolis
Midtown Exchange - 2929 Chicago	2929 Chicago Ave	Minneapolis
Setter Leach & Lindstrom Inc	1011 Nicollet Ave	Minneapolis
Seward Minneapolis Schools	2309 28th Ave S	Minneapolis
Sharpson Inc	2700 Hennepin Ave S	Minneapolis
Bob Shepherd Chiropractic	1930 Hennepin Ave	Minneapolis
Shiely Downtown Minneapolis	70 10th Ave S	Minneapolis
Shronts Vessey Johnson	825 Nicollet Mall Ste 1941	Minneapolis
Siewert Cabinet & Fixture Mfg	2740 31st Ave S	Minneapolis
Siewert Cabinet & Fixture Mfg	2837 18th Ave S	Minneapolis
Skil Corp	2539 Nicollet Ave	Minneapolis
Small Engine City	2612 Lyndale Ave S	Minneapolis
Smith Bros Service Station Inc	409 S 9th St	Minneapolis
Smithkline Bio Science Labs	1103 2nd Ave S	Minneapolis
Snyder Drug Inc 30	4010 Bloomington Ave	Minneapolis
South High School Minneapolis Schools	3131 19th Ave S	Minneapolis
Madina's Automotive Inc	3701 Cedar Ave S	Minneapolis
Sphinx Activewear Inc	2908 Harriet Ave	Minneapolis
Standard Machine Mold - Pleasant Ave	2942 Pleasant Ave	Minneapolis
Star Tribune	716 S 4th St	Minneapolis
Stockton & Egge Drs Dds	825 S 8th St Ste M05	Minneapolis
Style Vision	119 N 4th St Ste 106	Minneapolis
SuperAmerica 4378	2445 Bloomington Ave S	Minneapolis
Former SuperAmerica 4384	5 E Franklin Ave	Minneapolis
SuperAmerica 4385	1020 E Franklin Ave	Minneapolis
SuperAmerica 4388	101 W Grant St	Minneapolis
Former SuperAmerica 4394	2325 Lyndale Ave S	Minneapolis
Superamerica 9469	137 E Franklin Ave	Minneapolis
Sure Service	2756 Blaisdell Ave	Minneapolis
Target Packaging	12 S 6th St Ste 400	Minneapolis
Tasks Unlimited	2419 Nicollet Ave	Minneapolis
Theis Bros Tire Co	2933 Lyndale Ave S	Minneapolis
Theisen Vending Co - Mpls	3800 Nicollet Ave	Minneapolis
Thorp Building	519 Marquette Ave	Minneapolis
Tires Plus	3421 E Lake St	Minneapolis
Tires Plus Uptown 37	1103 W Lake St	Minneapolis

TABLE D1 - WHAT'S IN MY NEIGHBORHOOD, LEVEL 0, ALL SITES		
Tordoff James	2109 Bryant Ave S	Minneapolis
Towers Condominium The	15 S 1st St	Minneapolis
Trinity Apartments Corp	2800 E 31st St	Minneapolis
Twin City Filter Service	2529 25th Ave S	Minneapolis
U of M Community Healthcare	2001 Bloomington Ave	Minneapolis
Minnegasco - U of M Meter Site	1180 Main St SE	Minneapolis
U Of M Mineral Resources Center	Mineral Resources Center	Minneapolis
U of M St Anthony Falls Hydro	2 3rd Ave SE	Minneapolis
David A Uppgaard Dental	825 Nicollet Mall Ste 1737	Minneapolis
Uptown Community Clinic	2431 Hennepin Ave	Minneapolis
Uptown Dentist	1455 W Lake St Ste 305	Minneapolis
Uptown Imports	2904 Harriet Ave	Minneapolis
Uptown Minneapolis	2751 Hennepin Ave	Minneapolis
Uptown Veterinarian	3131 Hennepin Ave S	Minneapolis
Us Dhhs Phs Food & Drug Administration	240 Hennepin Ave	Minneapolis
USDA Food & Nutrition Service	220 S 2nd St Ste 311	Minneapolis
Usgsa United States General Serv Adm	212 3rd Ave S	Minneapolis
Valvoline Instant Oil Change Inc	2401 Hennepin Ave	Minneapolis
Kari E Prescott DPM PA	825 Nicollet Mall Ste 441	Minneapolis
Vangard Division Graco Inc	115 N 2nd St	Minneapolis
Vend A Wash Inc	3015 Chicago Ave	Minneapolis
Downtown Dental Associates - Nicollet Mall	825 Nicollet Mall Ste 731	Minneapolis
Birchwood Dental of Minneapolis	825 Nicollet Mall Ste 829	Minneapolis
Wanner Engineering Inc	1204 Chestnut Ave	Minneapolis
Fifth Street Owner Corp - Mpls	100 S 5th St Ste 200	Minneapolis
Watershed High School - Dupont	3400 Dupont Ave S Lowr Level	Minneapolis
West Lake Auto	3008 Pillsbury Ave S	Minneapolis
West Lake Collision	515 W Lake St	Minneapolis
White Way Cleaners 26th Street	115 E 26th St	Minneapolis
William Nunn Painting	3214 Harriet Ave S	Minneapolis
Dr Willis M Duryea MD	822 Marquette Ave Ste 208	Minneapolis
Wipson Posters Inc	3032 Hennepin Ave	Minneapolis
Intermaco Inc - Bloomington Ave	2400 Bloomington Ave	Minneapolis
Yourtype Center	127 N 7th St Ste 200	Minneapolis
Ziebart Of Minnesota Inc Mpls	609 E Grant St	Minneapolis
20 Washington Ave S	20 Washington Ave S	Minneapolis
Hennepin County Energy Center	600 10th Ave S	Minneapolis
One Financial Plaza	1 Financial Plz	Minneapolis
Gaviidae Common	651 Nicollet Mall	Minneapolis
Minneapolis Grain Exchange	400 S 4th St Ste 130	Minneapolis
Firstar Bank	607 Marquette Ave Fl 1	Minneapolis
Calco of Minneapolis	2751 Minnehaha Ave	Minneapolis
Lutheran Social Services Demolition	Park Ave S	Minneapolis
SCI Management Property	3700 Nicollet Ave	Minneapolis
Lasky Properties	1500 to 1544 Nicollet Ave S	Minneapolis
Lutheran Social Services	2414 Park Ave S	Minneapolis
The Wellstone	Address Unknown	Minneapolis

TABLE D1 - WHAT'S IN MY NEIGHBORHOOD, LEVEL 0, ALL SITES		
French Antiques	3018 Lyndale Ave S	Minneapolis
Rail Support Facility	See location description	Minneapolis
UMP Smileys Clinic	2020 28th St E	Minneapolis
U of M - East Bank Steam Tunnel Project	See location description	Minneapolis
Uptown Dental PLLC	1406 W Lake St Ste 100	Minneapolis
Fairview Riverside Hospital Expansion	Riverside Ave and 24th Ave S	Minneapolis
Norton Building	1905 Bluff St	Minneapolis
Lake Street Dental	1508 E Lake St	Minneapolis
U of M Children's Hospital - Fairview	See Location Description	Minneapolis
Minneapolis Public Housing - Cedar Ave	620 Cedar Ave S	Minneapolis
Riverside Professional Building	606 24th Ave S Ste B12	Minneapolis
Apartment Building	3521 Pleasant Ave	Minneapolis
Level 3 Minneapolis MPLSMNF1	222 S Ninth St	Minneapolis
Level 3 Minneapolis MPLSMNA2	2800 E 34th St	Minneapolis
MISCO/Minneapolis Speaker Co Inc	2637 32nd Ave S	Minneapolis
Chicago Dental	2120 Nicollet Ave	Minneapolis
City Tooth	825 Nicollet Mall Ste 812	Minneapolis
U of M - Spill Properties	See location description	Minneapolis
Highpoint Center for Printmaking	912 Lake St W	Minneapolis
Riverview Towers	1920 1st St S	Minneapolis
TCF Bank Stadium Broadcast Truck Parking	Address Unknown	Minneapolis
Main-8 Former Denopali Bldg	814 Hennepin Ave	Minneapolis
U of M Williams Arena Raze Tunnel - CSW	See location description	Minneapolis
Skarnes Inc	2907 E Franklin Ave	Minneapolis
Superior Design Landscapes	1785 Dupont Ave S	Minneapolis
Convention Center - Parking Lot	Grant & 12th St S	Minneapolis
Kee-Klee Litho	117 N 2nd St	Minneapolis
Curtis Hotel (Former)	3621 Park Ave	Minneapolis
Christians In Action	310 SE 18th St	Minneapolis
Challman & Co	2900 14th Ave S	Minneapolis
Calhoun Square - Minneapolis - CSW	See Location Description	Minneapolis
MacBain-Burns Inc dba Bachman Printing	510 Marquette Ave Ste 222	Minneapolis
Sir Speedy	121 S 8th St Ste 250	Minneapolis
Ing Clarion Realty Services	100 S 5th St	Minneapolis
Photobook Press	2836 Lyndale Ave S	Minneapolis
White Way Cleaners #3	113 26th St E	Minneapolis
Eleventh Avenue Addition	See location description	Minneapolis
Eleventh Avenue Addition #3	1101 W River Parkway	Minneapolis
Minnehaha Mall #2 (Target)	2500 E Lake St	Minneapolis
Valspar Research Lab	312 11th Ave S	Minneapolis
White Way Cleaners #2	See location description	Minneapolis
MN Orthopaedic Specialists - Mpls	701 25th Ave S Ste 505	Minneapolis
MNDOT I35W Bridge - Norton Building	See location description	Minneapolis
MNDOT I35W Bridge - Center Point Energy	See location description	Minneapolis
MNDOT I35W Bridge - Minneapolis Park Board	See location description	Minneapolis
MNDOT I35W Bridge - Metal-Matic	Inc.	See location description
Hennepin Healthcare System Inc	SW of W28th St and Nicollet Ave S	Minneapolis

TABLE D1 - WHAT'S IN MY NEIGHBORHOOD, LEVEL 0, ALL SITES		
MNDOT I35W Bridge - U-CW Partnership LLP	See location description	Minneapolis
MNDOT I35W Bridge - City of Minneapolis	See location description	Minneapolis
Rex Oil #2 (East Parcel)	See Location Description	Minneapolis
MINNEGASCO OU-2 Groundwater	1406 West River Pkwy	Minneapolis
Gas Holder #4 (U of M Underground Library OU1)	See location description	Minneapolis
Former Gas Station	2750 Cedar Ave S	Minneapolis
Riverside Endoscopy Center	606 24th Ave S Ste 800	Minneapolis
Mtc Garage	3100 Nicollet Ave	Minneapolis
Proposed HHS Clinic	11 28th St W	Minneapolis
Science Teaching/Student Svces Bldg	222 Pleasant St SE	Minneapolis
Downtown Orthopedics PA - Mpls	825 S 8th St Ste 902	Minneapolis
Kaufman Sign Co	2714 E 33rd St	Minneapolis
Paparella Ear Head & Neck	701 25th Ave S Ste 200	Minneapolis
West River Parkway	New W River Pkwy	Minneapolis
Covenire Care Nokomis	3717 23rd Ave S	Minneapolis
First Commercial Bank Property	1204 Lake St E	Minneapolis
Covenire Care - Minneapolis	3717 23rd Ave S	Minneapolis
Calhoun Square	3001 Hennepin Ave S	Minneapolis
CBS Radio - WCCO	625 2nd Ave S	Minneapolis
Calhoun Square	3001 Hennepin Ave S	Minneapolis
CCLRT - U of M Campus (Sec. 2)	See location description	Minneapolis
CCLRT - Civil West (Sec. 1	3 4)	
Neuro Surgical Associates - Minneapolis	800 E 28th St Ste 305	Minneapolis
Center for Reproductive Medicine	2828 Chicago Ave S Ste 400	Minneapolis
MN Lung Center/Sleep Institute - Minneapolis	920 E 28th St Ste 700	Minneapolis
Retina Center PA	710 E 24th St Ste 304	Minneapolis
Lyndale Avenue Gas Station	2752 Lyndale Ave S	Minneapolis
Mildred S Hanson MD PA	710 E 24th St Ste 403	Minneapolis
Southside Life Care Center	4105 Chicago Ave S	Minneapolis
MCTC - Waterproofing - Minneapolis	1501 Hennepin Ave	Minneapolis
MCAD Gateway Garden and Campus Parking	Address Unknown	Minneapolis
Skin Specialists Ltd - Mpls	825 Nicollet Mall Ste 1002	Minneapolis
National Vitamin	See location description	Minneapolis
David G Fine MD & Associates	825 S 8th St Ste 1116	Minneapolis
Calvary Baptist Church	2608 Blaisdale Ave S	Minneapolis
Noran Neurological Clinic - Minneapolis	2828 Chicago Ave S Ste 200	Minneapolis
A-1 Compressor Service - Minneapolis	3311 Snelling Ave S	Minneapolis
Native American Community Clinic	1213 E Franklin Ave	Minneapolis
Azam Ansari MD	825 S 8th St Ste 812	Minneapolis
Eye Care Associates PA - 825 Nicollet Mall	825 Nicollet Mall 20th Floor	Minneapolis
LifeTime Fitness - Minneapolis	600 1st Ave	Minneapolis
Baker Investments 1 LLP Property	409 Marquette Ave	Minneapolis
UN of Minnesota Care of Nalco Co	515 Delaware St SE Bldg 189	Minneapolis
Minnehaha Realty Group LLC Property	2450 Minnehaha Ave	Minneapolis
Met Council - Minneapolis Sewer System	Address Unknown	Minneapolis
Nico Products Inc - Stevens Ave	2928 - 2934 Stevens Ave S	Minneapolis
Northwest Automatic Products Inc	140 N 12th St	Minneapolis

TABLE D1 - WHAT'S IN MY NEIGHBORHOOD, LEVEL 0, ALL SITES		
CVS Pharmacy 3205	929 Portland Ave	Minneapolis
CVS Pharmacy 6040	1110 Hennepin Ave	Minneapolis
CVS Pharmacy 7172	2001 Nicollet Ave	Minneapolis
The Rayvic Co	1501 Hennepin Ave	Minneapolis
Abbott Northwestern Medical Heart Pharmacy	920 E 28th St Ste 92005	Minneapolis
SP 2782-323 - Minneapolis	See location description	Minneapolis
Minnesota Oncology Hematology	910 E 26th St Ste 200	Minneapolis
REM Hennepin Property	2548 Pleasant Ave S	Minneapolis
Industrial Plastics of Mpls Inc	3328 Snelling Ave S	Minneapolis
Schieks Palace Royale	115 S 4th St	Minneapolis
Lunds Lake Street	1450 W Lake St	Minneapolis
Metropolitan Urology Clinic - Minneapolis	920 E 28th St Ste 720	Minneapolis
Tandem Accelerator Building demolition	830 main street se	Minneapolis
Dental Unlimited	3255 Lyndale Ave S	Minneapolis
Minneapolis Medical Eye Clinic	710 E 24th St Ste 402	Minneapolis
Roundys Supermarkets Inc 8844	2919 27th Ave S	Minneapolis
Dr Lawrence Mulmed MD	710 E 24th St Ste 405	Minneapolis
Pharmaceutical Care Associates Inc	3137 Hennepin Ave S	Minneapolis
Greater Twin Cities United Way	404 S 8th St	Minneapolis
Redeemer Health & Rehab Center	625 W 31st St	Minneapolis
Southside Care Center	2644 Aldrich Ave S	Minneapolis
Former Pilgrim Cleaners	2750 Nicollet Ave South	Minneapolis
Benedictine Health Center of Minneapolis	618 E 17th St	Minneapolis
Chicago Ave S Streetscape Construct Proj	Address Unknown	Minneapolis
CVS Pharmacy 2978	316 15th Ave SE	Minneapolis
Karen Larsen Property/Apartment Building	3220 Garfield Ave S	Minneapolis
Uptown Rainbow Foods and Arbys	1104 Lagoon Ave and 1116 Lake St W	Minneapolis
Beta-West	800 Lasalle Ave Ste 1000	Minneapolis
Former Franklin Avenue Gas Station	1120 E Franklin Ave	Minneapolis
Walgreen's 11916	1221 W Lake St Ste 200	Minneapolis
Knoblauch Property	60 10th St S	Minneapolis
2605 2nd Avenue South	2605 2nd Ave S	Minneapolis
Mozaic	Address Unknown	Minneapolis
1316 East 24th Street	1316 E 24th St	Minneapolis
Whittier Coop	2609 Blaisdell Ave	Minneapolis
VTF Properties Apartment Complex	1941 Fremont Ave S	Minneapolis
Former Gas Station	3610 Lyndale Ave S	Minneapolis
U of M Bike Trail	BNSF Property	Minneapolis
Rainbow Building	1422 W Lake St	Minneapolis
Elliot Care Home Inc	1500 Elliot Ave S	Minneapolis
Providence Place	3720 23rd Ave S	Minneapolis
Allina Health Systems - Minneapolis	2828 10th Ave S	Minneapolis
SP 2781-415/SP 6282-197 (TH 94)	Address Unknown	St. Paul
312 Partnership LLC Property	312 S 3rd St	Minneapolis
Hiawatha LRT O and M Facility Expansion	Address Unknown	Minneapolis
South High School	3131 19th Ave S	Minneapolis
Dukes Cares & Towing	520 E Lake St	Minneapolis



TABLE D1 - WHAT'S IN MY NEIGHBORHOOD, LEVEL 0, ALL SITES		
Proposed Lunds on Hennepin	1201 1207 and 1213 Hennepin Ave	Minneapolis
3318 Girard - City of Minneapolis	3318 Girard Ave N	Minneapolis
Central Corridor Light Rail Transit	Address Unknown	Minneapolis
Buzza Historic Lofts	1006 W Lake St	Minneapolis
Bennett East Parcel	2821 thru 2825 Dupont Av S	Minneapolis
1100 South 2nd Street Property	1100 S 2nd St	Minneapolis
Realty EA LLC	1421 Park Ave S	Minneapolis
Metro Transit Rail Support Facility - Mpls	1919 24th St E	Minneapolis
Xcel Energy - Chestnut Service Center	1518 Chestnut Ave	Minneapolis
Shingle Creek East Paving Project	See location description	Minneapolis
Twin Lakes Subwatershed Improvements	See location description	Minneapolis
Wells Fargo Home Mortgage	2701 4th Ave S	Minneapolis
Minneapolis Municipal Storm Water	350 S 5th St	Minneapolis
Pillsbury Center	200 S 6th St	Minneapolis
Hyatt Regency Hotel	1300 Nicollet Ave	Minneapolis
Groveland Terrace Apts	50 Groveland Ter	Minneapolis
EnviroBate Metro	3301 E 26th St	Minneapolis
Hoppe Printing Inc	108 Washington Ave N	Minneapolis
Fuji Photo Film USA Inc - Mpls	1301 2nd Ave S	Minneapolis
CVS Pharmacy 8285	1010 Lake St W	Minneapolis
Target Stores Testing Labs	110 N 5th St Ste 433	Minneapolis
England Press Inc	123 N 3rd St	Minneapolis
Centerline Industries Inc	140 N 12th St	Minneapolis
Hennepin County	2116 29th St E	Minneapolis
Piper Jaffray & Hopwood Inc	222 S 9th St Ste 2100	Minneapolis
Isles Auto Repair	2402 Hennepin Ave	Minneapolis
Minneapolis Health Department Lab	250 S 4th St Room 523	Minneapolis
Health Partners Uptown	3001 Hennepin Ave Ste 35	Minneapolis
Municipal Building Commission	350 S 5th St Ste 105	Minneapolis
Midwest Automation Inc	3530 E 28th St	Minneapolis
Yellow Taxi Service Corp	3555 5th Ave S	Minneapolis
Geniune Parts Company	3610 Lyndale Ave S	Minneapolis
CenterPoint Energy - Linden	700 Linden Ave W	Minneapolis
Group Health Inc Fourth Ave Mpls	701 4th Ave S	Minneapolis
Fjelde & Co Furniture Service	8 E 32nd St	Minneapolis
American Express Financial Corp	80 S 8th St Ste 100	Minneapolis
Ellerbe Becket	800 Lasalle Ave	Minneapolis
Lasalle Plaza Limited Partnership	800 Lasalle Ave	Minneapolis
Mndot Highway Bridge Paint Proj	I 35 8th To Johnson St SE	Minneapolis
Lerner Publications Co	241 1st Ave North Ste 1	Minneapolis
Universal Marking Systems	2320 E 26th St	Minneapolis
Tubs Inc	705 5th St N	Minneapolis
SP 2725-52 ( TH 55) Reconstruction - CSW	See location description	Minneapolis
Adhesive Systems Technology - Mpls	2645 26th Ave S Ste A	Minneapolis
Target Store 1375	900 Nicollet Mall	Minneapolis
Car X Muffler & Brake Shop - Minneapolis	3021 E Lake St	Minneapolis
Minnehaha Creek Trail -CSW	200 Grain Exchange	Minneapolis

TABLE D1 - WHAT'S IN MY NEIGHBORHOOD, LEVEL 0, ALL SITES		
Farrell & O'Brien Painting	90 S 7th St	Minneapolis
Stevens Square Paving Project	See location description	Minneapolis
Roof Depot	1860 E 28th St	Minneapolis
Runway 17-35 West Cargo Apron	Minneapolis - St Paul Airport	Minneapolis
Kasota Business Center Phase II -CSW	See location description	Minneapolis
Norwest Bank - Northstar Bldg	608 2nd Ave S B	Minneapolis
PCL Construction Special Project	608 2nd Ave S Ste 90E	Minneapolis
225 South Sixth Street	601 S 2nd Ave Ste 3434	Minneapolis
USPS Minneapolis Main Post Office	1300 Hennepin Ave S	Minneapolis
NOP 100 Washington LLC - Hines	100 Washington Ave S Ste 1306	Minneapolis
Pediatric Services PA	301 Kenwood Pkwy	Minneapolis
Midwest Federal Building	607 Marquette Ave Fl 1	Minneapolis
Del's Union 76 Auto Service	3100 Hennepin Ave	Minneapolis
The III AN Co LLC	2700 E 28th St Ste 120	Minneapolis
Print Shop	3101 Hennepin Ave	Minneapolis
Franklin Business Center	1433 Franklin Ave E	Minneapolis
MNDOT - Glenwood Ave	81 Glenwood Ave	Minneapolis
Nicollet Mall Dental Center	825 Nicollet Mall Ste B	Minneapolis
Hennepin County	2859 20th Ave S	Minneapolis
Prosper Industries AIBDC	1433 E Franklin Ave Ste 15	Minneapolis
US Metric Mfg - 28th St Facility	3530 E 28th St	Minneapolis
Colby Charles H DDS PA	222 S 9th St	Minneapolis
Banners to Bullseyes Inc	2119 Lyndale Ave S # SiteB	Minneapolis
Kuhlmann William Dr Ltd	301 Kenwood Pkwy Site B	Minneapolis
Children's Dental Services	250 S 4th St Ste B	Minneapolis
Earl Wiekke & Sons Const Company	2514 24th Ave S	Minneapolis
Oxford Restoration	8 E 32nd St	Minneapolis
CenterPoint Energy - GWTF	1309 W River Pkwy	Minneapolis
Interface Graphics Inc	241 1st Ave N Ste B	Minneapolis
Minneapolis Youth Diversion Program	41 N 12th St	Minneapolis
ReliaStar Corporate Properties	111 Washington Ave S	Minneapolis
Automated Mailing Corp	1226 Linden Ave	Minneapolis
Cedar Box Company	2012 Cedar Ave S	Minneapolis
Boker's Inc	3104 Snelling Ave	Minneapolis
SP 27-752-09; CP 9518 & 9621	Washington Ave from Plymouth Ave	Minneapolis
Shamrock Group	2900 5th Ave S	Minneapolis
Capouch Iron Works Inc	2837 18th Ave S	Minneapolis
701 Associates LLC	701 4th Ave S Ste 1200	Minneapolis
Lake Nokomis WQ Improvement Project	See location description	Minneapolis
EnviroBate Metro - Minneapolis	2657 32nd Ave S Ste C	Minneapolis
Fuji Photo Film USA Inc - HHH Metrodome	900 S 5th St	Minneapolis
2001 St. Improvment Project	See location description	Minneapolis
Family Justice Center	110 4th St S	Minneapolis
Heitman Minnesota Mgmnt - IDS Center	80 S 8th St Ste 100	Minneapolis
Minneapolis City Center	33 6th St S	Minneapolis
LRT Construction Site	N 28th St & TH55 Pier 2	Minneapolis
Jefferson Lines	2100 E 26th St	Minneapolis



TABLE D1 - WHAT'S IN MY NEIGHBORHOOD, LEVEL 0, ALL SITES		
Leder Brothers Co	3240 Snelling Ave	Minneapolis
Minneapolis Machine & Tool Co	2632 30th Ave S	Minneapolis
Ellwood Automotive	3948 Nicollet Ave	Minneapolis
Tiro Industries Inc	2700 E 28th St Ste 120	Minneapolis
TLS (Tri Lite Stone Co) - SW	3016 4th Ave S	Minneapolis
U of M - FTCEM	501 23rd Ave SE	Minneapolis
SAF-ISIS USA	400 4th St S Ste 600	Minneapolis
Merchant & Gould	80 S 8th St Ste 3200	Minneapolis
Brothers Electric	3445 Cedar Ave S	Minneapolis
Firestone/Hawthorne	1100 Hawthorne Ave	Minneapolis
Mitchell Painting Inc	3307 Snelling Ave	Minneapolis
Bystrom Bros Inc	2200 Snelling Ave	Minneapolis
Wrightco Labs - Durall Manufacturing	200 88th St W Ste 5	Bloomington
Bureau of Engraving Inc - 4th St	500 S 4th St	Minneapolis

TABLE D2 - ALL ACTIVE SITES		
Site Name	Address	City
NRG - Riverside Plant	2450 Riverside Ave	Minneapolis
Minneapolis City Hall/Courthall	350 S 5th St Ste 105	Minneapolis
The Conservatory on Nicollet	800 Nicollet Mall Ste 501	Minneapolis
CSC Property LLC/American Express Client	901 3rd Ave S	Minneapolis
Heitman Minnesota Mgmnt - IDS Center	80 S 8th St Ste 100	Minneapolis
Minneapolis City Center	33 6th St S	Minneapolis
Portland Place Housing Development	See location description	Minneapolis
LaSalle Ave Construction Project	See Location Description	Minneapolis
Chicago Ave Bridge and Paving	See location description	Minneapolis
Franklin Lofts Renovation Project	111 E Franklin Ave	Minneapolis
River Run	1448 Marshall St	Minneapolis
U of M Tennis Facility Addition - CSW	See location description	Minneapolis
The Bridgewater - CSW	See location description	Minneapolis
U of M Rowing Facility	See location description	Minneapolis
Zenith and Aloft	See location description	Minneapolis
Little Earth IV - CSW	See location description	Minneapolis
TCF Bank Stadium Infrastructure-BP 4-CSW	See location description	Minneapolis
Calhoun Square - Minneapolis - CSW	See Location Description	Minneapolis
Covenire Care - Minneapolis	3717 23rd Ave S	Minneapolis
MCTC - Waterproofing - Minneapolis	1501 Hennepin Ave	Minneapolis
SP 2782-323 - Minneapolis	See location description	Minneapolis
Chicago Ave S Streetscape Construct Proj	Address Unknown	Minneapolis
Mozaic	Address Unknown	Minneapolis
SP 2781-415/SP 6282-197 (TH 94)	Address Unknown	St. Paul
Hiawatha LRT O and M Facility Expansion	Address Unknown	Minneapolis
South High School	3131 19th Ave S	Minneapolis
Central Corridor Light Rail Transit	Address Unknown	Minneapolis
SP 27-752-09; CP 9518 & 9621	Washington Ave from Plymouth Ave	Minneapolis
Sam Miller Corp	111 3rd Ave S Ste 310	Minneapolis
Residential - Bloomington Ave	2901 Bloomington Ave S	Minneapolis
Hennepin County Crime Lab Unit	531 Park Ave S	Minneapolis
Radisson Plaza Hotel Minneapolis	35 S 7th St	Minneapolis
First Covenant Church	810 S 7th St	Minneapolis
Former Despatch Laundry	113 26th St E	Minneapolis
Metro Transit	707 16th Ave S	Minneapolis
Que Computers Inc	2600 26th Ave S Ste 100	Minneapolis
Twin Cities Mechanical Wars	3536 15th Ave S	Minneapolis
Asset Accumulation Corp	2917 Bryant Ave S	Minneapolis
Graves 601 Hotel	601 1st Ave N	Minneapolis
Liquor Depot	1010 Washington Ave S	Minneapolis
180 Degrees Inc	236 Clifton Ave S	Minneapolis
The 614 Co	81 9th St S Ste 410	Minneapolis
New French Bakery - Minneapolis	2609 26th Ave S	Minneapolis
Hennepin Family Care East Lake	2700 E Lake St Ste 1100	Minneapolis
2700 East 28th LLC	2700 E 28th St Ste 120	Minneapolis
Knox Jewelers	2921 Lyndale Ave S	Minneapolis

TABLE D2 - ALL ACTIVE SITES		
LDIC an HFA Facility	120 S 6th St Ste 155	Minneapolis
HFA Addiction Medicine Clinic	807 Park Ave	Minneapolis
HFA Senior Care Clinic	1425 10th Ave S	Minneapolis
U of M Physicians Dental Clinic	606 24th Ave S Ste 200	Minneapolis
Frana Job Site	2936 Aldrich Ave S	Minneapolis
Commercial Non-Homstead	2833 Lyndale Ave S	Minneapolis
St Alberts School	3210 E 29th St	Minneapolis
901 Marquette Building	901 Marquette Ave	Minneapolis
O'Reilly Automotive 1976	3536 Nicollet Ave S	Minneapolis
Acme Awning	3206 Bloomington Ave	Minneapolis
AJ Johnson Co	111 Washington Ave N	Minneapolis
Allergy & Asthma Specialists - Mpls	825 Nicollet Mall Ste 1149	Minneapolis
Alphagraphics - Minneapolis	825 Hennepin Ave	Minneapolis
Alternator Rebuild Co Inc	110 E Lake St	Minneapolis
Am Graphics	206 N 3rd St	Minneapolis
Architectural Alliance	400 Clifton Ave	Minneapolis
Associated Bioscience Inc	1552 E Lake St	Minneapolis
At&T Long Lines	420 3rd Ave S	Minneapolis
Autopia	2311 Hennepin Ave	Minneapolis
Bach Wendy Z DDS	825 Nicollet Mall Ste 425	Minneapolis
Manley Cycle - Harriet Ave	2845 Harriet Ave S Ste 113	Minneapolis
Blacks Photography 810	180 Pillsbury Center	Minneapolis
Bloomington Lake Chiropractic	3105 Bloomington Ave	Minneapolis
Bloomington Lake Dental Clinic	3042 Bloomington Ave	Minneapolis
Blue Ribbon Cleaners	3148 Hennepin Ave	Minneapolis
Bioscrip	2100 Lyndale Ave S	Minneapolis
Mat's Auto Repair	1111 E Lake St	Minneapolis
Budget Rent A Car Corp	1101 E Lake St	Minneapolis
Bureau Of Eng Site Hennepin Cty	502 S 4th St	Minneapolis
Butler Square United Properties	100 N 6th St Ste 220C	Minneapolis
Carmicael Lynch Advertising Inc	800 Hennepin Ave	Minneapolis
Sexton Building	529 S 7th St	Minneapolis
Consulting Radiologists Ltd	920 E 28th St Ste 240	Minneapolis
Copies Inc	2922 Bryant Ave S	Minneapolis
Dis Specialties	3013 Lyndale Ave S	Minneapolis
Our Saviors Housing	2219 Chicago Ave	Minneapolis
Downtown Orthopedics Pa	90 S 9th St Ste 200	Minneapolis
DF Countryman Co	2425 E 26th St	Minneapolis
East Lake Collison	2111 E Lake St	Minneapolis
Nicollet Auto Services	3611 Nicollet Ave S	Minneapolis
Moka Pharmacy	1515 E Franklin Ave	Minneapolis
Electric Service Co	1609 Chicago Ave	Minneapolis
Zeller Realty Corp	120 S 6th St Ste 1700	Minneapolis
WD Forbes Co Inc	129 6th Ave SE	Minneapolis
Fort Automobile Contracting	1312 E Lake St	Minneapolis
Fritz Freeway Gas	2800 Bloomington Ave	Minneapolis
Auto-Mate GTC	3541 Cedar Ave S	Minneapolis

TABLE D2 - ALL ACTIVE SITES		
Gerst Barry D DDS PA	2701 Nicollet Ave	Minneapolis
GFI America	2815 Blaisdell Ave	Minneapolis
Graphic Systems Inc	2632 26th Ave S	Minneapolis
Green Auto & Mechanic	3009 Clinton Ave	Minneapolis
Guy Am Auto Service	2938 5th Ave S	Minneapolis
Walgreen's Store 1737	200 W Lake St	Minneapolis
Hanks Photographic Services Inc	27 N 4th St Ste 500	Minneapolis
Heng 1 Hour Photo Inc	2750 Nicollet Ave S Ste 120	Minneapolis
Hennepin County Chemical Dependency Ctr	1800 Chicago Ave	Minneapolis
Hennepin County Regional RR Authority	823 17th Ave S	Minneapolis
Halvey's Body Shop	3527 Chicago Ave	Minneapolis
Hi Lake Auto Repair	2121 E Lake St	Minneapolis
Hirshfield's - Minneapolis	325 Lake St E	Minneapolis
Humphrey Radiator Service	48 S 12th St	Minneapolis
Ids Center	80 S 8th St Ste 3450	Minneapolis
Indian Health Board of Minneapolis	1315 E 24th St	Minneapolis
Ingman Laboratories Inc	2945 34th Ave S	Minneapolis
Isles Dental Dr Raij	2534 Hennepin Ave	Minneapolis
J Michaels Co	2608 1st Ave S	Minneapolis
Johns Auto Body	816 Park Ave	Minneapolis
Kenwood Chiropractic Arts	1311 W 25th St	Minneapolis
Kevins Amoco	3800 Bloomington Ave	Minneapolis
Key Group Advertising	501 S 8th St	Minneapolis
Kingston Robert J Dds	825 Nicollet Mall Ste 939	Minneapolis
Kitty Clinic	3447 Lyndale Ave S	Minneapolis
Tim J Clavin DDS	825 Nicollet Mall Ste 609	Minneapolis
Kolstad Bros Automotive - 12th Ave	2940 12th Ave S	Minneapolis
Kosmoski Specialty Company	2521 1/2 27th Ave S	Minneapolis
Lakemaps Inc	3755 Bloomington Ave	Minneapolis
Langford Tool & Drill	1125 Washington Ave S	Minneapolis
Fifth Street Owner Corp	150 5th St S	Minneapolis
Lyndale Auto Service	2809 Lyndale Ave S	Minneapolis
Mall Liquors Inc	46 S 6th St	Minneapolis
Marriott Hotel City Center	30 S 7th St	Minneapolis
Martin E E III DDS	825 Nicollet Mall Ste 431	Minneapolis
Meyer Offset Printing Inc	2920 Bryant Ave S	Minneapolis
Midwest Group One	2645 26th Ave S	Minneapolis
Miller Meester Adv	17 N Washington Ave	Minneapolis
Minneapolis City Of Municipal Garage	1219 W Lake St	Minneapolis
Minneapolis College Of Art & Design	2501 Stevens Ave	Minneapolis
Minneapolis Community Development Agency	NW Corner Of W Rvr Pkwy/4th Av	Minneapolis
Minneapolis Enameling Grand Ave	2842 Grand Ave S	Minneapolis
USPS Mpls Process/Dist/Main Post Office	100 S 1st St	Minneapolis
Allina Medical Clinic - Nicollet Mall	825 Nicollet Mall Ste 300	Minneapolis
Minneapolis Schools Lyndale	3333 Grand Ave S	Minneapolis
Minneapolis Schools Wilder	3320 Elliot Ave	Minneapolis
CenterPoint Energy - River	1240 River Pkwy W	Minneapolis

TABLE D2 - ALL ACTIVE SITES		
Minnesota Council Of Churches	122 W Franklin Ave Ste 100	Minneapolis
Minnesota Metal Finishing Inc - Snelling	3222 Snelling Ave	Minneapolis
Mpls Municipal Ramp Maintenance	318 2nd Ave N	Minneapolis
Murphy Design Inc	119 N 4th St Ste 201	Minneapolis
Nicollet Hardware	3805 Nicollet Ave	Minneapolis
Nokomis Bowling Lanes	4040 Bloomington Ave	Minneapolis
Nokomis Dental Center	4110 Cedar Ave S	Minneapolis
Ann L Norrlander DDS	825 Nicollet Mall Ste 1553	Minneapolis
North American Carrousel	2804 27th Ave S	Minneapolis
Northstar Chiropractic Clinic	625 Marquette Ave Ste 223	Minneapolis
Northwest Post & Transfer	81 S 9th St Ste 240	Minneapolis
Northwest Process Equipment Inc	4005 15th Ave S	Minneapolis
Norwest Bank Chicago Lake Na	809 E Lake St	Minneapolis
Multi Tenant Commercial Building	3045 Hennepin Ave	Minneapolis
NWC Limited Partnership	90 S 7th St	Minneapolis
Oak Grove Chiropractic Clinic	430 Oak Grove St Ste B1	Minneapolis
Oas Auto Body & Paint Shop	215 W 29th St	Minneapolis
Orthopaedic Consultants Pa - 9th St	74 9th St S Ste 711	Minneapolis
Osman Cleaner	2500 Hennepin Ave	Minneapolis
Intermaco Inc - Mpls	2943 Park Ave S	Minneapolis
Penn Cycle Shops Inc - Minneapolis	710 W Lake St	Minneapolis
Pillsbury Bp/Fs Tech Center	425 Main St SE	Minneapolis
Proex Photo & Portrait 1531	2917 26th Ave S	Minneapolis
Proex Photo 1534	527 Marquette Ave S	Minneapolis
Prosper Industries Inc	3017 4th Ave S	Minneapolis
Public Land/Private Lot	1727 Lasalle Ave	Minneapolis
Dr Michele Reynolds	825 Nicollet Mall Ste 911	Minneapolis
Riteway Motor Parts Inc	160 Glenwood Ave	Minneapolis
Roland Mill Work Company	2836 Lyndale Ave S	Minneapolis
Samuel Bingham Co	900 S 3rd St	Minneapolis
Setter Leach & Lindstrom Inc	1011 Nicollet Ave	Minneapolis
Bob Shepherd Chiropractic	1930 Hennepin Ave	Minneapolis
Stockton & Egge Drs Dds	825 S 8th St Ste M05	Minneapolis
Sure Service	2756 Blaisdell Ave	Minneapolis
Target Packaging	12 S 6th St Ste 400	Minneapolis
Tasks Unlimited	2419 Nicollet Ave	Minneapolis
Theis Bros Tire Co	2933 Lyndale Ave S	Minneapolis
Tordoff James	2109 Bryant Ave S	Minneapolis
Towers Condominium The	15 S 1st St	Minneapolis
Twin City Filter Service	2529 25th Ave S	Minneapolis
U of M Community Healthcare	2001 Bloomington Ave	Minneapolis
U of M St Anthony Falls Hydro	2 3rd Ave SE	Minneapolis
David A Uppgaard Dental	825 Nicollet Mall Ste 1737	Minneapolis
Uptown Community Clinic	2431 Hennepin Ave	Minneapolis
Uptown Dentist	1455 W Lake St Ste 305	Minneapolis
Uptown Imports	2904 Harriet Ave	Minneapolis
Uptown Veterinarian	3131 Hennepin Ave S	Minneapolis

TABLE D2 - ALL ACTIVE SITES		
Us Dhhs Phs Food & Drug Administration	240 Hennepin Ave	Minneapolis
Valvoline Instant Oil Change Inc	2401 Hennepin Ave	Minneapolis
Kari E Prescott DPM PA	825 Nicollet Mall Ste 441	Minneapolis
Birchwood Dental of Minneapolis	825 Nicollet Mall Ste 829	Minneapolis
Watershed High School - Dupont	3400 Dupont Ave S Lowr Level	Minneapolis
West Lake Auto	3008 Pillsbury Ave S	Minneapolis
William Nunn Painting	3214 Harriet Ave S	Minneapolis
Wipson Posters Inc	3032 Hennepin Ave	Minneapolis
Ziebart Of Minnesota Inc Mpls	609 E Grant St	Minneapolis
UMP Smileys Clinic	2020 28th St E	Minneapolis
Uptown Dental PLLC	1406 W Lake St Ste 100	Minneapolis
Lake Street Dental	1508 E Lake St	Minneapolis
Riverside Professional Building	606 24th Ave S Ste B12	Minneapolis
Chicago Dental	2120 Nicollet Ave	Minneapolis
City Tooth	825 Nicollet Mall Ste 812	Minneapolis
MN Orthopaedic Specialists - Mpls	701 25th Ave S Ste 505	Minneapolis
Riverside Endoscopy Center	606 24th Ave S Ste 800	Minneapolis
Downtown Orthopedics PA - Mpls	825 S 8th St Ste 902	Minneapolis
Kaufman Sign Co	2714 E 33rd St	Minneapolis
Paparella Ear Head & Neck	701 25th Ave S Ste 200	Minneapolis
CBS Radio - WCCO	625 2nd Ave S	Minneapolis
Center for Reproductive Medicine	2828 Chicago Ave S Ste 400	Minneapolis
MN Lung Center/Sleep Institute - Minneapolis	920 E 28th St Ste 700	Minneapolis
Retina Center PA	710 E 24th St Ste 304	Minneapolis
Mildred S Hanson MD PA	710 E 24th St Ste 403	Minneapolis
Southside Life Care Center	4105 Chicago Ave S	Minneapolis
Skin Specialists Ltd - Mpls	825 Nicollet Mall Ste 1002	Minneapolis
David G Fine MD & Associates	825 S 8th St Ste 1116	Minneapolis
Noran Neurological Clinic - Minneapolis	2828 Chicago Ave S Ste 200	Minneapolis
A-1 Compressor Service - Minneapolis	3311 Snelling Ave S	Minneapolis
Native American Community Clinic	1213 E Franklin Ave	Minneapolis
Azam Ansari MD	825 S 8th St Ste 812	Minneapolis
Eye Care Associates PA - 825 Nicollet Mall	825 Nicollet Mall 20th Floor	Minneapolis
LifeTime Fitness - Minneapolis	600 1st Ave	Minneapolis
Nico Products Inc - Stevens Ave	2928 - 2934 Stevens Ave S	Minneapolis
CVS Pharmacy 3205	929 Portland Ave	Minneapolis
CVS Pharmacy 6040	1110 Hennepin Ave	Minneapolis
CVS Pharmacy 7172	2001 Nicollet Ave	Minneapolis
Abbott Northwestern Medical Heart Pharmacy	920 E 28th St Ste 92005	Minneapolis
Minnesota Oncology Hematology	910 E 26th St Ste 200	Minneapolis
Schieks Palace Royale	115 S 4th St	Minneapolis
Lunds Lake Street	1450 W Lake St	Minneapolis
Metropolitan Urology Clinic - Minneapolis	920 E 28th St Ste 720	Minneapolis
Dental Unlimited	3255 Lyndale Ave S	Minneapolis
Minneapolis Medical Eye Clinic	710 E 24th St Ste 402	Minneapolis
Roundys Supermarkets Inc 8844	2919 27th Ave S	Minneapolis
Dr Lawrence Mulmed MD	710 E 24th St Ste 405	Minneapolis

TABLE D2 - ALL ACTIVE SITES		
Pharmaceutical Care Associates Inc	3137 Hennepin Ave S	Minneapolis
Greater Twin Cities United Way	404 S 8th St	Minneapolis
Redeemer Health & Rehab Center	625 W 31st St	Minneapolis
Southside Care Center	2644 Aldrich Ave S	Minneapolis
Benedictine Health Center of Minneapolis	618 E 17th St	Minneapolis
CVS Pharmacy 2978	316 15th Ave SE	Minneapolis
Walgreen's 11916	1221 W Lake St Ste 200	Minneapolis
Whittier Coop	2609 Blaisdell Ave	Minneapolis
Elliot Care Home Inc	1500 Elliot Ave S	Minneapolis
Providence Place	3720 23rd Ave S	Minneapolis
Allina Health Systems - Minneapolis	2828 10th Ave S	Minneapolis
3318 Girard - City of Minneapolis	3318 Girard Ave N	Minneapolis
Realty EA LLC	1421 Park Ave S	Minneapolis
Metro Transit Rail Support Facility - Mpls	1919 24th St E	Minneapolis
Hyatt Regency Hotel	1300 Nicollet Ave	Minneapolis
EnviroBate Metro	3301 E 26th St	Minneapolis
England Press Inc	123 N 3rd St	Minneapolis
Piper Jaffray & Hopwood Inc	222 S 9th St Ste 2100	Minneapolis
Isles Auto Repair	2402 Hennepin Ave	Minneapolis
Health Partners Uptown	3001 Hennepin Ave Ste 35	Minneapolis
Municipal Building Commission	350 S 5th St Ste 105	Minneapolis
Geniune Parts Company	3610 Lyndale Ave S	Minneapolis
CenterPoint Energy - Linden	700 Linden Ave W	Minneapolis
Fjelde & Co Furniture Service	8 E 32nd St	Minneapolis
American Express Financial Corp	80 S 8th St Ste 100	Minneapolis
Ellerbe Becket	800 Lasalle Ave	Minneapolis
Universal Marking Systems	2320 E 26th St	Minneapolis
Adhesive Systems Technology - Mpls	2645 26th Ave S Ste A	Minneapolis
Target Store 1375	900 Nicollet Mall	Minneapolis
Car X Muffler & Brake Shop - Minneapolis	3021 E Lake St	Minneapolis
Farrell & O'Brien Painting	90 S 7th St	Minneapolis
225 South Sixth Street	601 S 2nd Ave Ste 3434	Minneapolis
USPS Minneapolis Main Post Office	1300 Hennepin Ave S	Minneapolis
NOP 100 Washington LLC - Hines	100 Washington Ave S Ste 1306	Minneapolis
Midwest Federal Building	607 Marquette Ave Fl 1	Minneapolis
Print Shop	3101 Hennepin Ave	Minneapolis
Franklin Business Center	1433 Franklin Ave E	Minneapolis
MNDOT - Glenwood Ave	81 Glenwood Ave	Minneapolis
Nicollet Mall Dental Center	825 Nicollet Mall Ste B	Minneapolis
Hennepin County	2859 20th Ave S	Minneapolis
Oxford Restoration	8 E 32nd St	Minneapolis
CenterPoint Energy - GWTF	1309 W River Pkwy	Minneapolis
701 Associates LLC	701 4th Ave S Ste 1200	Minneapolis
EnviroBate Metro - Minneapolis	2657 32nd Ave S Ste C	Minneapolis
Family Justice Center	110 4th St S	Minneapolis
LRT Construction Site	N 28th St & TH55 Pier 2	Minneapolis
SAF-ISIS USA	400 4th St S Ste 600	Minneapolis



TABLE D2 - ALL ACTIVE SITES		
Merchant & Gould	80 S 8th St Ste 3200	Minneapolis
Brothers Electric	3445 Cedar Ave S	Minneapolis
Photos	Inc	2601 Minnehaha Ave S
MNDOT I35W Bridge - Metal-Matic	Inc.	See location description
MISCO/Minneapolis Speaker Co Inc	2637 32nd Ave S	Minneapolis
Challman & Co	2900 14th Ave S	Minneapolis
Industrial Plastics of Mpls Inc	3328 Snelling Ave S	Minneapolis
JO Peterson Building	1501 Washington Ave S	Minneapolis
Fairview Riverside Hospital	2450 Riverside Ave	Minneapolis
Carlson School Expansion Site	1901 4th St SE	Minneapolis
Former Gas Station	1931 Minnehaha Ave	Minneapolis
Hope Community Property	1931 Portland Ave S and E Franklin	Minneapolis
JPM Properties	3008 Hennepin Ave S	Minneapolis
SCI Management Property	3700 Nicollet Ave	Minneapolis
Lutheran Social Services	2414 Park Ave S	Minneapolis
French Antiques	3018 Lyndale Ave S	Minneapolis
Superior Design Landscapes	1785 Dupont Ave S	Minneapolis
Valspar Research Lab	312 11th Ave S	Minneapolis
Proposed HHS Clinic	11 28th St W	Minneapolis
First Commercial Bank Property	1204 Lake St E	Minneapolis
Baker Investments 1 LLP Property	409 Marquette Ave	Minneapolis
Minnehaha Realty Group LLC Property	2450 Minnehaha Ave	Minneapolis
REM Hennepin Property	2548 Pleasant Ave S	Minneapolis
Former Franklin Avenue Gas Station	1120 E Franklin Ave	Minneapolis
VTF Properties Apartment Complex	1941 Fremont Ave S	Minneapolis
Former Gas Station	3610 Lyndale Ave S	Minneapolis
312 Partnership LLC Property	312 S 3rd St	Minneapolis
CCLRT - Civil West (Sec. 1		3 4)
Velocity Technology Solutions Inc	1200 Washington Ave S Ste 200	Minneapolis
Minneapolis Public Library	310 Nicollet Mall	Minneapolis
Metro Transit - Nicollet Garage	10 32nd St W	Minneapolis
Macy's Department Store Nicollet Mall	700 Nicollet Mall	Minneapolis
Hilton Hotel Minneapolis	1001 Marquette Ave	Minneapolis
Wreck Brothers Auto Inc - Mpls	3749 Chicago Ave	Minneapolis
Quality Paint & Autobody Inc	3452 Lyndale Ave S	Minneapolis
The Nicollet	1001 Nicollet Ave	Minneapolis
Main Heating Plant	1180 Main St SE	Minneapolis
Pillsbury "A" Mill Complex	335 Main St SE	Minneapolis
Machinery Lofts	2848 Pleasant Ave	Minneapolis
Metro Transit Nicollet Garage - SW	10 32nd St W	Minneapolis
NRG Energy Center Minneapolis	816 S 4th Ave	Minneapolis
Dayton Rogers Manufacturing Co	2824 13th Ave S	Minneapolis
Acme Foundry Co	3161 Hiawatha Ave	Minneapolis
American Swedish Institute	2600 Park Ave S	Minneapolis
H&B Elevators Inc	2629 30th Ave S	Minneapolis
Superamerica #4232	3453 Nicollet Ave S	Minneapolis
Sidal Realty Co	2201 Blaisdell Ave S	Minneapolis



TABLE D2 - ALL ACTIVE SITES		
Vision Loss Resources	1936 Lyndale Ave S	Minneapolis
Andrew Residence Management Inc	1215 S 9th St	Minneapolis
Fifth Ave High Rise	2419 5th Ave S	Minneapolis
Juvenile Justice Center	626 S 6th St	Minneapolis
Holiday Stationstore #2	2124 E Franklin Ave	Minneapolis
SuperAmerica 4378	2445 Bloomington Ave S	Minneapolis
Us West Switching Station	3317 24th Ave S	Minneapolis
Atrium Apartments	314 Hennepin Ave	Minneapolis
Signe Burckhardt Manor	2533 1st Ave S	Minneapolis
MPHA Apartment Building	1515 Park Ave S	Minneapolis
Carlson Hall-north Central Univ	916 E 15th St	Minneapolis
Inter City Oil #95	2325 E 38th St	Minneapolis
Salem Lutheran Church	610 W 28th St	Minneapolis
Nicollet Towers	1350 Nicollet Mall	Minneapolis
Di Hed Yokes	3023 Snelling Ave S	Minneapolis
Cedar 94 Apartments	2220 E Franklin Ave	Minneapolis
Scheele Property	1849 E 38th St	Minneapolis
Mack Engineering Corp - Building I	3215 E 26th St	Minneapolis
Windsor Apartments	2011 3rd Ave S	Minneapolis
ADM Milling Co - Nokomis Flour Mill	3501 Hiawatha Ave	Minneapolis
Bituminous Roadways - Minneapolis	2825 Cedar Ave S	Minneapolis
Amigo Service Center - 3544 Lyndale	3544 Lyndale Ave S	Minneapolis
Atlantic Press Inc	3457 Chicago Ave	Minneapolis
Top Gear Autoworks	2401 E Lake St	Minneapolis
Bernie & Jims Amoco	300 S 10th St	Minneapolis
Bituminous Roadways - Longfellow Ave	2828 Longfellow Ave S	Minneapolis
Blake Upper School	511 Kenwood Pkwy	Minneapolis
Bryant Auto Repair	1716 E Lake St	Minneapolis
Brito Auto Paint LLC	3013 Pillsbury Ave S	Minneapolis
Car X Muffler Shops - Minneapolis	1001 W Lake St	Minneapolis
Childrens Dental Services	1098 Andersen Ln	Minneapolis
Clydes Service	1400 E 38th St	Minneapolis
Community Hospital Linen Service	201 Royalston Ave	Minneapolis
EDMC - Art Institutes Int MN	15 S 9th St	Minneapolis
East End Imports	2801 E Franklin Ave	Minneapolis
Elite Cleaners & Launderers	3101 Minnehaha Ave	Minneapolis
First Unitarian Society	900 Mount Curve Ave	Minneapolis
Franklin Amoco	2000 3rd Ave S	Minneapolis
Hennepin Avenue United Methodist	511 Groveland Ave	Minneapolis
Hennepin County Medical Center	701 Park Ave S	Minneapolis
Hopf & Hopf Printing Inc	2711 E Franklin Ave	Minneapolis
Industrial Electric Company	600 S 9th St	Minneapolis
Janesville Auto Transport Co	2700 26th Ave S	Minneapolis
Johnstech International	511 11th Ave S	Minneapolis
D&T Auto Repair Garage	3446 Bloomington Ave S	Minneapolis
Jr Import Service Inc	3700 Chicago Ave	Minneapolis
Kmart Store 3405	10 W Lake St	Minneapolis

TABLE D2 - ALL ACTIVE SITES		
Landry Transfer Inc	2515 23rd Ave S	Minneapolis
Lathrop Paint Supply Co Inc	2741 Hennepin Ave	Minneapolis
Lehmann Center	1006 W Lake St	Minneapolis
Longfellow Minneapolis Schools	3017 E 31st St	Minneapolis
Ludvigsons AI Standard	3551 Lyndale Ave S	Minneapolis
Merit Printing	117 N 2nd St	Minneapolis
Midas Muffler Lake St	601 E Lake St	Minneapolis
Miller Towing	2935 Pleasant Ave	Minneapolis
David's Auto Repair	4000 Bloomington Ave S	Minneapolis
Children's Health Care Hospital/Clinics	2525 Chicago Ave S	Minneapolis
Minneapolis city of	309 2nd Ave S	Minneapolis
Minneapolis Fire Department Stores	1858 E 27th St	Minneapolis
Nordquist Holdings LLC dba Nordquist Sign Co	312 W Lake St	Minneapolis
Opus Corp Powers Building	430 Marquette Ave	Minneapolis
Portland Lake Motors/Customs Body Repair	3005 5th Ave S	Minneapolis
Hennepin County Environmental Serv PPL	509 Washington Ave S	Minneapolis
Physicians & Surgeons Bldg	59 S 9th St	Minneapolis
Riverside Plaza	1610 S 6th St	Minneapolis
Midtown Exchange - 2929 Chicago	2929 Chicago Ave	Minneapolis
Seward Minneapolis Schools	2309 28th Ave S	Minneapolis
Sharpson Inc	2700 Hennepin Ave S	Minneapolis
Smith Bros Service Station Inc	409 S 9th St	Minneapolis
South High School Minneapolis Schools	3131 19th Ave S	Minneapolis
Madina's Automotive Inc	3701 Cedar Ave S	Minneapolis
Standard Machine Mold - Pleasant Ave	2942 Pleasant Ave	Minneapolis
Star Tribune	716 S 4th St	Minneapolis
Former SuperAmerica 4384	5 E Franklin Ave	Minneapolis
SuperAmerica 4388	101 W Grant St	Minneapolis
Theisen Vending Co - Mpls	3800 Nicollet Ave	Minneapolis
Tires Plus	3421 E Lake St	Minneapolis
Tires Plus Uptown 37	1103 W Lake St	Minneapolis
Trinity Apartments Corp	2800 E 31st St	Minneapolis
Minnegasco - U of M Meter Site	1180 Main St SE	Minneapolis
Usgsa United States General Serv Adm	212 3rd Ave S	Minneapolis
Wanner Engineering Inc	1204 Chestnut Ave	Minneapolis
West Lake Collision	515 W Lake St	Minneapolis
Hennepin County Energy Center	600 10th Ave S	Minneapolis
Gaviidae Common	651 Nicollet Mall	Minneapolis
Fairview Riverside Hospital Expansion	Riverside Ave and 24th Ave S	Minneapolis
Minneapolis Public Housing - Cedar Ave	620 Cedar Ave S	Minneapolis
Apartment Building	3521 Pleasant Ave	Minneapolis
Highpoint Center for Printmaking	912 Lake St W	Minneapolis
Riverview Towers	1920 1st St S	Minneapolis
Karen Larsen Property/Apartment Building	3220 Garfield Ave S	Minneapolis
U of M Bike Trail	BNSF Property	Minneapolis
Buzza Historic Lofts	1006 W Lake St	Minneapolis
1100 South 2nd Street Property	1100 S 2nd St	Minneapolis

TABLE D2 - ALL ACTIVE SITES		
Xcel Energy - Chestnut Service Center	1518 Chestnut Ave	Minneapolis
Wells Fargo Home Mortgage	2701 4th Ave S	Minneapolis
Pillsbury Center	200 S 6th St	Minneapolis
CVS Pharmacy 8285	1010 Lake St W	Minneapolis
Lerner Publications Co	241 1st Ave North Ste 1	Minneapolis
Tubs Inc	705 5th St N	Minneapolis
Roof Depot	1860 E 28th St	Minneapolis
The III AN Co LLC	2700 E 28th St Ste 120	Minneapolis
Earl Wiekke & Sons Const Company	2514 24th Ave S	Minneapolis
Interface Graphics Inc	241 1st Ave N Ste B	Minneapolis
Minneapolis Youth Diversion Program	41 N 12th St	Minneapolis
ReliaStar Corporate Properties	111 Washington Ave S	Minneapolis
Boker's Inc	3104 Snelling Ave	Minneapolis
Shamrock Group	2900 5th Ave S	Minneapolis
Fuji Photo Film USA Inc - HHH Metrodome	900 S 5th St	Minneapolis
Jefferson Lines	2100 E 26th St	Minneapolis
Leder Brothers Co	3240 Snelling Ave	Minneapolis
Ellwood Automotive	3948 Nicollet Ave	Minneapolis
U of M - FTCEM	501 23rd Ave SE	Minneapolis
Firestone/Hawthorne	1100 Hawthorne Ave	Minneapolis
Bystrom Bros Inc	2200 Snelling Ave	Minneapolis
Bureau of Engraving Inc - 4th St	500 S 4th St	Minneapolis
Lasky Properties	1500 to 1544 Nicollet Ave S	Minneapolis
Hennepin Healthcare System Inc	SW of W28th St and Nicollet Ave S	Minneapolis
Calhoun Square	3001 Hennepin Ave S	Minneapolis
Uptown Rainbow Foods and Arbys	1104 Lagoon Ave and 1116 Lake St W	Minneapolis
Proposed Lunds on Hennepin	1201 1207 and 1213 Hennepin Ave	Minneapolis
Bennett East Parcel	2821 thru 2825 Dupont Av S	Minneapolis
MINNEGASCO OU-2 Groundwater	1406 West River Pkwy	Minneapolis
Commercial Property (koch)	2500 Minnehaha Ave	Minneapolis
Bethlehem Baptist Church	720 13th Ave S	Minneapolis
Individual Building	2525 Harriet Ave S	Minneapolis
Fire Station #17	821 E 35th St	Minneapolis
Phillps Community School	2300 Chicago Ave	Minneapolis
Lowe House	143 E 19th St	Minneapolis
Franklin Towers	1920 4th Ave S	Minneapolis
Hennepin County Medical Center Parking	626 Park Ave	Minneapolis
Holiday Stationstore #209	2448 Hennepin Ave	Minneapolis
Apartment Building	3500 Dupont Ave	Minneapolis
Apartment Building	3217 14th Ave S	Minneapolis
Stimson Building	704 Hennepin	Minneapolis
Old Greyhound Bus Depot	29 N 7th St	Minneapolis
University of MN Medical Center Fairview	608 25th Ave	Minneapolis
510 Groveland Associates	510 Groveland Ave	Minneapolis
Clausens Oil Co	22 E Franklin Ave S	Minneapolis
Mpls Auditorium & Convention Hall	1403 Stevens Ave S	Minneapolis
Minneapolis Moto Mart	3301 Hiawatha	Minneapolis

TABLE D2 - ALL ACTIVE SITES		
Oak Grove Towers	215 Oak Grove St	Minneapolis
Seward Towers East	2910 E Franklin	Minneapolis
Walker Place	3701 Bryant Ave S	Minneapolis
Charles L Horn Towers	115 W 31st St	Minneapolis
Hiawatha Towers Apartment	1700 E 22nd St	Minneapolis
Philip Wagenstien Bldg/health Sci (b/c)	516 Delaware St SE	Minneapolis
Norwest Bank-lake St	3030 Nicollet	Minneapolis
Buckingham Apartments (the)	1500 La Salle	Minneapolis
Minnehaha Courts	1901 Minnehaha Ave	Minneapolis
Cedar Lake Apartment	3121 Cedar Ave S	Minneapolis
Clara Doerr Club	1717 2nd Ave	Minneapolis
Central Lutheran Church	333 S 12th St	Minneapolis
Stanley Hall Court Apartments	2108 Pleasant	Minneapolis
Twin Court Apartments	611 W Ridgewood	Minneapolis
Best Apts	2008 Park Ave S	Minneapolis
Cedar Small Engine	3804 Cedar Ave S	Minneapolis
Dain Bosworth Plaza	60 S 6th St	Minneapolis
Augustana Lutheran Church	704 11th Ave S	Minneapolis
Bush Terrace Condominiums	4017 14th Ave S	Minneapolis
Cottle Properties	127 W Lake St	Minneapolis
Booth Manor	1421 Yale St	Minneapolis
Inner City Church	1812 Park Ave S	Minneapolis
Hotel Luxeford Suites	1101 LaSalle Ave	Minneapolis
Park Plaza Apartments	505 527 Humboldt Ave N	Minneapolis
U Of Mn Basic Sciences Building	312 Church St SE	Minneapolis
University Court Apartments	1414 S 3rd St	Minneapolis
Cathedral Church Of Saint Mark	519 Oak Grove St	Minneapolis
Special Education Center	2600 Grand Ave S	Minneapolis
Manangement And Economics Building	271 19th Ave S	Minneapolis
19th Avenue Parking Ramp	300 19th Ave S	Minneapolis
Marquette Place Apartments	1314 Marquette	Minneapolis
Native American Indian Center	1530 E Franklin Ave	Minneapolis
Mount Curve Apartments	1710 Bryant Ave	Minneapolis
Meci Convention Center Plant	125 W 15th St	Minneapolis
Baker Plant	706 2nd Ave S	Minneapolis
Valvoline Rapid Oil Change	2401 Hennepin Ave S	Minneapolis
718 North Washington Avenue Building	718 N Washington Ave	Minneapolis
Autopia	2311 Hennepin Ave S	Minneapolis
Miller Towing Inc	2935 Pleasant Ave S	Minneapolis
University Of Minnesota Mayo Building	420 Delaware St S E	Minneapolis
Hiawatha Towers Apartments	2019 16th Ave S	Minneapolis
City Of Minneapolis 3rd District	121 Glenwood Ave N	Minneapolis
Cedar High Apartments	630 Cedar Ave S	Minneapolis
Roof Depot Inc	1860 E 28th St	Minneapolis
Centerpoint Energy-groundwater Trtmt	1309 W River Pkwy	Minneapolis
Jacobs Trading Company	80 S 8th St #2900	Minneapolis
Metrodome Square Building	1010 S 7th St	Minneapolis

TABLE D2 - ALL ACTIVE SITES		
Eiethes Womens Club Of Minneapolis	410 Oak Grove St	Minneapolis
Dunbar Armored Shop	3026 Minnehaha Ave	Minneapolis
Ing	100 Washington Ave S Ste 1306	Minneapolis
University Of Mn Molecular/cell	420 SE Washington Ave	Minneapolis
Mn Council Of Churches	122 Franklin Ave W	Minneapolis
TCF Tower Building	121 S 8th St	Minneapolis
Norton Building	1905 Bluff St	Minneapolis
Level 3 Minneapolis MPLSMNF1	222 S Ninth St	Minneapolis
Level 3 Minneapolis MPLSMNA2	2800 E 34th St	Minneapolis
Ing Clarion Realty Services	100 S 5th St	Minneapolis
Calvary Baptist Church	2608 Blaisdale Ave S	Minneapolis
Dukes Cares & Towing	520 E Lake St	Minneapolis
Ford Deep Rock	See location description	Minneapolis
Milwaukee Road Depot	See location description	Minneapolis
Applause	2841 Hennepin Ave	Minneapolis
Urban Ventures II (Merc)	2900 & 2916 4th Ave S	Minneapolis
29th Street Corridor Tunnel	See Location Description	Minneapolis
Greenway Terrace Development	2850 Cedar Ave S	Minneapolis
HCRRA ROW	See Location Description	Minneapolis
Artcraft Press	907-929 Portland Ave S	Minneapolis
Anishinabe Bii-Gii-Wiin	Franklin Ave & Hiawatha Ave	Minneapolis
Lumen Building	See Location Description	Minneapolis
Parcel F	See location description	Minneapolis
Le Parisien - Lyndale	2301 Lyndale Ave S	Minneapolis
Hopf and Hopf Printing	2711 East Franklin Avenue	Minneapolis
Brekke Properties	See location description	Minneapolis
Franklin Steele Commons Project	See location description	Minneapolis
MNDOT I35W Bridge	See location description	Minneapolis
Rail Support Facility	See location description	Minneapolis
U of M - Spill Properties	See location description	Minneapolis
White Way Cleaners #3	113 26th St E	Minneapolis
Eleventh Avenue Addition	See location description	Minneapolis
Eleventh Avenue Addition #3	1101 W River Parkway	Minneapolis
Minnehaha Mall #2 (Target)	2500 E Lake St	Minneapolis
MNDOT I35W Bridge - Norton Building	See location description	Minneapolis
MNDOT I35W Bridge - Center Point Energy	See location description	Minneapolis
MNDOT I35W Bridge - Minneapolis Park Board	See location description	Minneapolis
MNDOT I35W Bridge - U-CW Partnership LLP	See location description	Minneapolis
MNDOT I35W Bridge - City of Minneapolis	See location description	Minneapolis
Gas Holder #4 (U of M Underground Library OU1)	See location description	Minneapolis
Calhoun Square	3001 Hennepin Ave S	Minneapolis
CCLRT - U of M Campus (Sec. 2)	See location description	Minneapolis
Lyndale Avenue Gas Station	2752 Lyndale Ave S	Minneapolis
National Vitamin	See location description	Minneapolis
2605 2nd Avenue South	2605 2nd Ave S	Minneapolis
1316 East 24th Street	1316 E 24th St	Minneapolis
CenterPoint Energy - GWTF	1300 River Pkwy W Ste A	Minneapolis

TABLE D2 - ALL ACTIVE SITES		
Kwong Tung Foods Inc	1840 E 38th St	Minneapolis
Minneapolis Grain Exchange	400 S 4th St Ste 130	Minneapolis
Calco of Minneapolis	2751 Minnehaha Ave	Minneapolis
Met Council - Minneapolis Sewer System	Address Unknown	Minneapolis
Minneapolis Municipal Storm Water	350 S 5th St	Minneapolis

TABLE D3 - NO SMALL TO MINIMUM HAZARDOUS WASTE SITES

Site Name	Address	City
NRG - Riverside Plant	2450 Riverside Ave	Minneapolis
Minneapolis City Hall/Courthall	350 S 5th St Ste 105	Minneapolis
The Conservatory on Nicollet	800 Nicollet Mall Ste 501	Minneapolis
CSC Property LLC/American Express Client	901 3rd Ave S	Minneapolis
Heitman Minnesota Mgmnt - IDS Center	80 S 8th St Ste 100	Minneapolis
Minneapolis City Center	33 6th St S	Minneapolis
Portland Place Housing Development	See location description	Minneapolis
LaSalle Ave Construction Project	See Location Description	Minneapolis
Chicago Ave Bridge and Paving	See location description	Minneapolis
Franklin Lofts Renovation Project	111 E Franklin Ave	Minneapolis
River Run	1448 Marshall St	Minneapolis
U of M Tennis Facility Addition - CSW	See location description	Minneapolis
The Bridgewater - CSW	See location description	Minneapolis
U of M Rowing Facility	See location description	Minneapolis
Zenith and Aloft	See location description	Minneapolis
Little Earth IV - CSW	See location description	Minneapolis
TCF Bank Stadium Infrastructure-BP 4-CSW	See location description	Minneapolis
Calhoun Square - Minneapolis - CSW	See Location Description	Minneapolis
Covenire Care - Minneapolis	3717 23rd Ave S	Minneapolis
MCTC - Waterproofing - Minneapolis	1501 Hennepin Ave	Minneapolis
SP 2782-323 - Minneapolis	See location description	Minneapolis
Chicago Ave S Streetscape Construct Proj	Address Unknown	Minneapolis
Mozaic	Address Unknown	Minneapolis
SP 2781-415/SP 6282-197 (TH 94)	Address Unknown	St. Paul
Hiawatha LRT O and M Facility Expansion	Address Unknown	Minneapolis
South High School	3131 19th Ave S	Minneapolis
Central Corridor Light Rail Transit	Address Unknown	Minneapolis
SP 27-752-09; CP 9518 & 9621	Washington Ave from Plymouth Ave to	Minneapolis
Photos Inc	2601 Minnehaha Ave S	Minneapolis
MNDOT I35W Bridge - Metal-Matic Inc.	See location description	Minneapolis
MISCO/Minneapolis Speaker Co Inc	2637 32nd Ave S	Minneapolis
Challman & Co	2900 14th Ave S	Minneapolis
Industrial Plastics of Mpls Inc	3328 Snelling Ave S	Minneapolis
JO Peterson Building	1501 Washington Ave S	Minneapolis
Fairview Riverside Hospital	2450 Riverside Ave	Minneapolis
Carlson School Expansion Site	1901 4th St SE	Minneapolis
Former Gas Station	1931 Minnehaha Ave	Minneapolis
Hope Community Property	1931 Portland Ave S and E Franklin	Minneapolis
JPM Properties	3008 Hennepin Ave S	Minneapolis
SCI Management Property	3700 Nicollet Ave	Minneapolis
Lutheran Social Services	2414 Park Ave S	Minneapolis
French Antiques	3018 Lyndale Ave S	Minneapolis
Superior Design Landscapes	1785 Dupont Ave S	Minneapolis
Valspar Research Lab	312 11th Ave S	Minneapolis
Proposed HHS Clinic	11 28th St W	Minneapolis
First Commercial Bank Property	1204 Lake St E	Minneapolis



TABLE D3 - NO SMALL TO MINIMUM HAZARDOUS WASTE SITES		
Baker Investments 1 LLP Property	409 Marquette Ave	Minneapolis
Minnehaha Realty Group LLC Property	2450 Minnehaha Ave	Minneapolis
REM Hennepin Property	2548 Pleasant Ave S	Minneapolis
Former Franklin Avenue Gas Station	1120 E Franklin Ave	Minneapolis
VTF Properties Apartment Complex	1941 Fremont Ave S	Minneapolis
Former Gas Station	3610 Lyndale Ave S	Minneapolis
312 Partnership LLC Property	312 S 3rd St	Minneapolis
CCLRT - Civil West (Sec. 13 4)	See location description	Minneapolis
Velocity Technology Solutions Inc	1200 Washington Ave S Ste 200	Minneapolis
Minneapolis Public Library	310 Nicollet Mall	Minneapolis
Metro Transit - Nicollet Garage	10 32nd St W	Minneapolis
Macy's Department Store Nicollet Mall	700 Nicollet Mall	Minneapolis
Hilton Hotel Minneapolis	1001 Marquette Ave	Minneapolis
Wreck Brothers Auto Inc - Mpls	3749 Chicago Ave	Minneapolis
Quality Paint & Autobody Inc	3452 Lyndale Ave S	Minneapolis
The Nicollet	1001 Nicollet Ave	Minneapolis
Main Heating Plant	1180 Main St SE	Minneapolis
Pillsbury "A" Mill Complex	335 Main St SE	Minneapolis
Machinery Lofts	2848 Pleasant Ave	Minneapolis
Metro Transit Nicollet Garage - SW	10 32nd St W	Minneapolis
NRG Energy Center Minneapolis	816 S 4th Ave	Minneapolis
Dayton Rogers Manufacturing Co	2824 13th Ave S	Minneapolis
Acme Foundry Co	3161 Hiawatha Ave	Minneapolis
American Swedish Institute	2600 Park Ave S	Minneapolis
H&B Elevators Inc	2629 30th Ave S	Minneapolis
Superamerica #4232	3453 Nicollet Ave S	Minneapolis
Sidal Realty Co	2201 Blaisdell Ave S	Minneapolis
Vision Loss Resources	1936 Lyndale Ave S	Minneapolis
Andrew Residence Management Inc	1215 S 9th St	Minneapolis
Fifth Ave High Rise	2419 5th Ave S	Minneapolis
Juvenile Justice Center	626 S 6th St	Minneapolis
Holiday Stationstore #2	2124 E Franklin Ave	Minneapolis
SuperAmerica 4378	2445 Bloomington Ave S	Minneapolis
Us West Switching Station	3317 24th Ave S	Minneapolis
Atrium Apartments	314 Hennepin Ave	Minneapolis
Signe Burckhardt Manor	2533 1st Ave S	Minneapolis
MPHA Apartment Building	1515 Park Ave S	Minneapolis
Carlson Hall-north Central Univ	916 E 15th St	Minneapolis
Inter City Oil #95	2325 E 38th St	Minneapolis
Salem Lutheran Church	610 W 28th St	Minneapolis
Nicollet Towers	1350 Nicollet Mall	Minneapolis
Di Hed Yokes	3023 Snelling Ave S	Minneapolis
Cedar 94 Apartments	2220 E Franklin Ave	Minneapolis
Scheele Property	1849 E 38th St	Minneapolis
Mack Engineering Corp - Building I	3215 E 26th St	Minneapolis
Windsor Apartments	2011 3rd Ave S	Minneapolis
ADM Milling Co - Nokomis Flour Mill	3501 Hiawatha Ave	Minneapolis



TABLE D3 - NO SMALL TO MINIMUM HAZARDOUS WASTE SITES		
Bituminous Roadways - Minneapolis	2825 Cedar Ave S	Minneapolis
Amigo Service Center - 3544 Lyndale	3544 Lyndale Ave S	Minneapolis
Atlantic Press Inc	3457 Chicago Ave	Minneapolis
Top Gear Autoworks	2401 E Lake St	Minneapolis
Bernie & Jims Amoco	300 S 10th St	Minneapolis
Bituminous Roadways - Longfellow Ave	2828 Longfellow Ave S	Minneapolis
Blake Upper School	511 Kenwood Pkwy	Minneapolis
Bryant Auto Repair	1716 E Lake St	Minneapolis
Brito Auto Paint LLC	3013 Pillsbury Ave S	Minneapolis
Car X Muffler Shops - Minneapolis	1001 W Lake St	Minneapolis
Childrens Dental Services	1098 Andersen Ln	Minneapolis
Clydes Service	1400 E 38th St	Minneapolis
Community Hospital Linen Service	201 Royalston Ave	Minneapolis
EDMC - Art Institutes Int MN	15 S 9th St	Minneapolis
East End Imports	2801 E Franklin Ave	Minneapolis
Elite Cleaners & Launderers	3101 Minnehaha Ave	Minneapolis
First Unitarian Society	900 Mount Curve Ave	Minneapolis
Franklin Amoco	2000 3rd Ave S	Minneapolis
Hennepin Avenue United Methodist	511 Groveland Ave	Minneapolis
Hennepin County Medical Center	701 Park Ave S	Minneapolis
Hopf & Hopf Printing Inc	2711 E Franklin Ave	Minneapolis
Industrial Electric Company	600 S 9th St	Minneapolis
Janesville Auto Transport Co	2700 26th Ave S	Minneapolis
Johnstech International	511 11th Ave S	Minneapolis
D&T Auto Repair Garage	3446 Bloomington Ave S	Minneapolis
Jr Import Service Inc	3700 Chicago Ave	Minneapolis
Kmart Store 3405	10 W Lake St	Minneapolis
Landry Transfer Inc	2515 23rd Ave S	Minneapolis
Lathrop Paint Supply Co Inc	2741 Hennepin Ave	Minneapolis
Lehmann Center	1006 W Lake St	Minneapolis
Longfellow Minneapolis Schools	3017 E 31st St	Minneapolis
Ludvigsons Al Standard	3551 Lyndale Ave S	Minneapolis
Merit Printing	117 N 2nd St	Minneapolis
Midas Muffler Lake St	601 E Lake St	Minneapolis
Miller Towing	2935 Pleasant Ave	Minneapolis
David's Auto Repair	4000 Bloomington Ave S	Minneapolis
Children's Health Care Hospital/Clinics	2525 Chicago Ave S	Minneapolis
Minneapolis city of	309 2nd Ave S	Minneapolis
Minneapolis Fire Department Stores	1858 E 27th St	Minneapolis
Nordquist Holdings LLC dba Nordquist Sign Co	312 W Lake St	Minneapolis
Opus Corp Powers Building	430 Marquette Ave	Minneapolis
Portland Lake Motors/Customs Body Repair	3005 5th Ave S	Minneapolis
Hennepin County Environmental Serv PPL	509 Washington Ave S	Minneapolis
Physicians & Surgeons Bldg	59 S 9th St	Minneapolis
Riverside Plaza	1610 S 6th St	Minneapolis
Midtown Exchange - 2929 Chicago	2929 Chicago Ave	Minneapolis
Seward Minneapolis Schools	2309 28th Ave S	Minneapolis

TABLE D3 - NO SMALL TO MINIMUM HAZARDOUS WASTE SITES		
Sharpson Inc	2700 Hennepin Ave S	Minneapolis
Smith Bros Service Station Inc	409 S 9th St	Minneapolis
South High School Minneapolis Schools	3131 19th Ave S	Minneapolis
Madina's Automotive Inc	3701 Cedar Ave S	Minneapolis
Standard Machine Mold - Pleasant Ave	2942 Pleasant Ave	Minneapolis
Star Tribune	716 S 4th St	Minneapolis
Former SuperAmerica 4384	5 E Franklin Ave	Minneapolis
SuperAmerica 4388	101 W Grant St	Minneapolis
Theisen Vending Co - Mpls	3800 Nicollet Ave	Minneapolis
Tires Plus	3421 E Lake St	Minneapolis
Tires Plus Uptown 37	1103 W Lake St	Minneapolis
Trinity Apartments Corp	2800 E 31st St	Minneapolis
Minnegasco - U of M Meter Site	1180 Main St SE	Minneapolis
Usgsa United States General Serv Adm	212 3rd Ave S	Minneapolis
Wanner Engineering Inc	1204 Chestnut Ave	Minneapolis
West Lake Collision	515 W Lake St	Minneapolis
Hennepin County Energy Center	600 10th Ave S	Minneapolis
Gaviidae Common	651 Nicollet Mall	Minneapolis
Fairview Riverside Hospital Expansion	Riverside Ave and 24th Ave S	Minneapolis
Minneapolis Public Housing - Cedar Ave	620 Cedar Ave S	Minneapolis
Apartment Building	3521 Pleasant Ave	Minneapolis
Highpoint Center for Printmaking	912 Lake St W	Minneapolis
Riverview Towers	1920 1st St S	Minneapolis
Karen Larsen Property/Apartment Building	3220 Garfield Ave S	Minneapolis
U of M Bike Trail	BNSF Property	Minneapolis
Buzza Historic Lofts	1006 W Lake St	Minneapolis
1100 South 2nd Street Property	1100 S 2nd St	Minneapolis
Xcel Energy - Chestnut Service Center	1518 Chestnut Ave	Minneapolis
Wells Fargo Home Mortgage	2701 4th Ave S	Minneapolis
Pillsbury Center	200 S 6th St	Minneapolis
CVS Pharmacy 8285	1010 Lake St W	Minneapolis
Lerner Publications Co	241 1st Ave North Ste 1	Minneapolis
Tubs Inc	705 5th St N	Minneapolis
Roof Depot	1860 E 28th St	Minneapolis
The III AN Co LLC	2700 E 28th St Ste 120	Minneapolis
Earl Wickle & Sons Const Company	2514 24th Ave S	Minneapolis
Interface Graphics Inc	241 1st Ave N Ste B	Minneapolis
Minneapolis Youth Diversion Program	41 N 12th St	Minneapolis
ReliaStar Corporate Properties	111 Washington Ave S	Minneapolis
Boker's Inc	3104 Snelling Ave	Minneapolis
Shamrock Group	2900 5th Ave S	Minneapolis
Fuji Photo Film USA Inc - HHH Metrodome	900 S 5th St	Minneapolis
Jefferson Lines	2100 E 26th St	Minneapolis
Leder Brothers Co	3240 Snelling Ave	Minneapolis
Ellwood Automotive	3948 Nicollet Ave	Minneapolis
U of M - FTCEM	501 23rd Ave SE	Minneapolis
Firestone/Hawthorne	1100 Hawthorne Ave	Minneapolis

TABLE D3 - NO SMALL TO MINIMUM HAZARDOUS WASTE SITES		
Bystrom Bros Inc	2200 Snelling Ave	Minneapolis
Bureau of Engraving Inc - 4th St	500 S 4th St	Minneapolis
Lasky Properties	1500 to 1544 Nicollet Ave S	Minneapolis
Hennepin Healthcare System Inc	SW of W28th St and Nicollet Ave S	Minneapolis
Calhoun Square	3001 Hennepin Ave S	Minneapolis
Uptown Rainbow Foods and Arbys	1104 Lagoon Ave and 1116 Lake St W	Minneapolis
Proposed Lunds on Hennepin	1201 1207 and 1213 Hennepin Ave	Minneapolis
Bennett East Parcel	2821 thru 2825 Dupont Av S	Minneapolis
MINNEGASCO OU-2 Groundwater	1406 West River Pkwy	Minneapolis
Commercial Property (koch)	2500 Minnehaha Ave	Minneapolis
Bethlehem Baptist Church	720 13th Ave S	Minneapolis
Individual Building	2525 Harriet Ave S	Minneapolis
Fire Station #17	821 E 35th St	Minneapolis
Phillps Community School	2300 Chicago Ave	Minneapolis
Lowe House	143 E 19th St	Minneapolis
Franklin Towers	1920 4th Ave S	Minneapolis
Hennepin County Medical Center Parking	626 Park Ave	Minneapolis
Holiday Stationstore #209	2448 Hennepin Ave	Minneapolis
Apartment Building	3500 Dupont Ave	Minneapolis
Apartment Building	3217 14th Ave S	Minneapolis
Stimson Building	704 Hennepin	Minneapolis
Old Greyhound Bus Depot	29 N 7th St	Minneapolis
University of MN Medical Center Fairview	608 25th Ave	Minneapolis
510 Groveland Associates	510 Groveland Ave	Minneapolis
Clausens Oil Co	22 E Franklin Ave S	Minneapolis
Mpls Auditorium & Convention Hall	1403 Stevens Ave S	Minneapolis
Minneapolis Moto Mart	3301 Hiawatha	Minneapolis
Oak Grove Towers	215 Oak Grove St	Minneapolis
Seward Towers East	2910 E Franklin	Minneapolis
Walker Place	3701 Bryant Ave S	Minneapolis
Charles L Horn Towers	115 W 31st St	Minneapolis
Hiawatha Towers Apartment	1700 E 22nd St	Minneapolis
Philip Wagenstien Bldg/health Sci (b/c)	516 Delaware St SE	Minneapolis
Norwest Bank-lake St	3030 Nicollet	Minneapolis
Buckingham Apartments (the)	1500 La Salle	Minneapolis
Minnehaha Courts	1901 Minnehaha Ave	Minneapolis
Cedar Lake Apartment	3121 Cedar Ave S	Minneapolis
Clara Doerr Club	1717 2nd Ave	Minneapolis
Central Lutheran Church	333 S 12th St	Minneapolis
Stanley Hall Court Apartments	2108 Pleasant	Minneapolis
Twin Court Apartments	611 W Ridgewood	Minneapolis
Best Apts	2008 Park Ave S	Minneapolis
Cedar Small Engine	3804 Cedar Ave S	Minneapolis
Dain Bosworth Plaza	60 S 6th St	Minneapolis
Augustana Lutheran Church	704 11th Ave S	Minneapolis
Bush Terrace Condominiums	4017 14th Ave S	Minneapolis
Cottle Properties	127 W Lake St	Minneapolis

TABLE D3 - NO SMALL TO MINIMUM HAZARDOUS WASTE SITES		
Booth Manor	1421 Yale St	Minneapolis
Inner City Church	1812 Park Ave S	Minneapolis
Hotel Luxeford Suites	1101 LaSalle Ave	Minneapolis
Park Plaza Apartments	505 527 Humboldt Ave N	Minneapolis
U Of Mn Basic Sciences Building	312 Church St SE	Minneapolis
University Court Apartments	1414 S 3rd St	Minneapolis
Cathedral Church Of Saint Mark	519 Oak Grove St	Minneapolis
Special Education Center	2600 Grand Ave S	Minneapolis
Manangement And Economics Building	271 19th Ave S	Minneapolis
19th Avenue Parking Ramp	300 19th Ave S	Minneapolis
Marquette Place Apartments	1314 Marquette	Minneapolis
Native American Indian Center	1530 E Franklin Ave	Minneapolis
Mount Curve Apartments	1710 Bryant Ave	Minneapolis
Meci Convention Center Plant	125 W 15th St	Minneapolis
Baker Plant	706 2nd Ave S	Minneapolis
Valvoline Rapid Oil Change	2401 Hennepin Ave S	Minneapolis
718 North Washington Avenue Building	718 N Washington Ave	Minneapolis
Autopia	2311 Hennepin Ave S	Minneapolis
Miller Towing Inc	2935 Pleasant Ave S	Minneapolis
University Of Minnesota Mayo Building	420 Delaware St S E	Minneapolis
Hiawatha Towers Apartments	2019 16th Ave S	Minneapolis
City Of Minneapolis 3rd District	121 Glenwood Ave N	Minneapolis
Cedar High Apartments	630 Cedar Ave S	Minneapolis
Roof Depot Inc	1860 E 28th St	Minneapolis
Centerpoint Energy-groundwater Trtmt	1309 W River Pkwy	Minneapolis
Jacobs Trading Company	80 S 8th St #2900	Minneapolis
Metrodome Square Building	1010 S 7th St	Minneapolis
Eiethe Womans Club Of Minneapolis	410 Oak Grove St	Minneapolis
Dunbar Armored Shop	3026 Minnehaha Ave	Minneapolis
Ing	100 Washington Ave S Ste 1306	Minneapolis
University Of Mn Molecular/cell	420 SE Washington Ave	Minneapolis
Mn Council Of Churches	122 Franklin Ave W	Minneapolis
TCF Tower Building	121 S 8th St	Minneapolis
Norton Building	1905 Bluff St	Minneapolis
Level 3 Minneapolis MPLSMNF1	222 S Ninth St	Minneapolis
Level 3 Minneapolis MPLSMNA2	2800 E 34th St	Minneapolis
Ing Clarion Realty Services	100 S 5th St	Minneapolis
Calvary Baptist Church	2608 Blaisdale Ave S	Minneapolis
Dukes Cares & Towing	520 E Lake St	Minneapolis
Ford Deep Rock	See location description	Minneapolis
Milwaukee Road Depot	See location description	Minneapolis
Applause	2841 Hennepin Ave	Minneapolis
Urban Ventures II (Merc)	2900 & 2916 4th Ave S	Minneapolis
29th Street Corridor Tunnel	See Location Description	Minneapolis
Greenway Terrace Development	2850 Cedar Ave S	Minneapolis
HCRR ROW	See Location Description	Minneapolis
Artcraft Press	907-929 Portland Ave S	Minneapolis

TABLE D3 - NO SMALL TO MINIMUM HAZARDOUS WASTE SITES

Anishinabe Bii-Gii-Wiin	Franklin Ave & Hiawatha Ave	Minneapolis
Lumen Building	See Location Description	Minneapolis
Parcel F	See location description	Minneapolis
Le Parisien - Lyndale	2301 Lyndale Ave S	Minneapolis
Hopf and Hopf Printing	2711 East Franklin Avenue	Minneapolis
Brekke Properties	See location description	Minneapolis
Franklin Steele Commons Project	See location description	Minneapolis
MNDOT I35W Bridge	See location description	Minneapolis
Rail Support Facility	See location description	Minneapolis
U of M - Spill Properties	See location description	Minneapolis
White Way Cleaners #3	113 26th St E	Minneapolis
Eleventh Avenue Addition	See location description	Minneapolis
Eleventh Avenue Addition #3	1101 W River Parkway	Minneapolis
Minnehaha Mall #2 (Target)	2500 E Lake St	Minneapolis
MNDOT I35W Bridge - Norton Building	See location description	Minneapolis
MNDOT I35W Bridge - Center Point Energy	See location description	Minneapolis
MNDOT I35W Bridge - Minneapolis Park Board	See location description	Minneapolis
MNDOT I35W Bridge - U-CW Partnership LLP	See location description	Minneapolis
MNDOT I35W Bridge - City of Minneapolis	See location description	Minneapolis
Gas Holder #4 (U of M Underground Library OU1)	See location description	Minneapolis
Calhoun Square	3001 Hennepin Ave S	Minneapolis
CCLRT - U of M Campus (Sec. 2)	See location description	Minneapolis
Lyndale Avenue Gas Station	2752 Lyndale Ave S	Minneapolis
National Vitamin	See location description	Minneapolis
2605 2nd Avenue South	2605 2nd Ave S	Minneapolis
1316 East 24th Street	1316 E 24th St	Minneapolis
CenterPoint Energy - GWTF	1300 River Pkwy W Ste A	Minneapolis
Kwong Tung Foods Inc	1840 E 38th St	Minneapolis
Minneapolis Grain Exchange	400 S 4th St Ste 130	Minneapolis
Calco of Minneapolis	2751 Minnehaha Ave	Minneapolis
Met Council - Minneapolis Sewer System	Address Unknown	Minneapolis
Minneapolis Municipal Storm Water	350 S 5th St	Minneapolis

TABLE D4 - WIMN - NO AIR PERMITS

Site Name	Address	City
Portland Place Housing Development	See location description	Minneapolis
LaSalle Ave Construction Project	See Location Description	Minneapolis
Chicago Ave Bridge and Paving	See location description	Minneapolis
Franklin Lofts Renovation Project	111 E Franklin Ave	Minneapolis
River Run	1448 Marshall St	Minneapolis
U of M Tennis Facility Addition - CSW	See location description	Minneapolis
The Bridgewater - CSW	See location description	Minneapolis
U of M Rowing Facility	See location description	Minneapolis
Zenith and Aloft	See location description	Minneapolis
Little Earth IV - CSW	See location description	Minneapolis
TCF Bank Stadium Infrastructure-BP 4-CSW	See location description	Minneapolis
Calhoun Square - Minneapolis - CSW	See Location Description	Minneapolis
Covenire Care - Minneapolis	3717 23rd Ave S	Minneapolis
MCTC - Waterproofing - Minneapolis	1501 Hennepin Ave	Minneapolis
SP 2782-323 - Minneapolis	See location description	Minneapolis
Chicago Ave S Streetscape Construct Proj	Address Unknown	Minneapolis
Mozaic	Address Unknown	Minneapolis
SP 2781-415/SP 6282-197 (TH 94)	Address Unknown	St. Paul
Hiawatha LRT O and M Facility Expansion	Address Unknown	Minneapolis
South High School	3131 19th Ave S	Minneapolis
Central Corridor Light Rail Transit	Address Unknown	Minneapolis
SP 27-752-09; CP 9518 & 9621	Washington Ave from Plymouth Ave to	Minneapolis
Photos Inc	2601 Minnehaha Ave S	Minneapolis
MNDOT I35W Bridge - Metal-Matic Inc.	See location description	Minneapolis
MISCO/Minneapolis Speaker Co Inc	2637 32nd Ave S	Minneapolis
Challman & Co	2900 14th Ave S	Minneapolis
Industrial Plastics of Mpls Inc	3328 Snelling Ave S	Minneapolis
JO Peterson Building	1501 Washington Ave S	Minneapolis
Fairview Riverside Hospital	2450 Riverside Ave	Minneapolis
Carlson School Expansion Site	1901 4th St SE	Minneapolis
Former Gas Station	1931 Minnehaha Ave	Minneapolis
Hope Community Property	1931 Portland Ave S and E Franklin	Minneapolis
JPM Properties	3008 Hennepin Ave S	Minneapolis
SCI Management Property	3700 Nicollet Ave	Minneapolis
Lutheran Social Services	2414 Park Ave S	Minneapolis
French Antiques	3018 Lyndale Ave S	Minneapolis
Superior Design Landscapes	1785 Dupont Ave S	Minneapolis
Valspar Research Lab	312 11th Ave S	Minneapolis
Proposed HHS Clinic	11 28th St W	Minneapolis
First Commercial Bank Property	1204 Lake St E	Minneapolis
Baker Investments 1 LLP Property	409 Marquette Ave	Minneapolis
Minnehaha Realty Group LLC Property	2450 Minnehaha Ave	Minneapolis
REM Hennepin Property	2548 Pleasant Ave S	Minneapolis
Former Franklin Avenue Gas Station	1120 E Franklin Ave	Minneapolis
VTF Properties Apartment Complex	1941 Fremont Ave S	Minneapolis
Former Gas Station	3610 Lyndale Ave S	Minneapolis



TABLE D4 - WIMN - NO AIR PERMITS

312 Partnership LLC Property	312 S 3rd St	Minneapolis
CCLRT - Civil West (Sec. 13 4)	See location description	Minneapolis
Velocity Technology Solutions Inc	1200 Washington Ave S Ste 200	Minneapolis
Minneapolis Public Library	310 Nicollet Mall	Minneapolis
Metro Transit - Nicollet Garage	10 32nd St W	Minneapolis
Macy's Department Store Nicollet Mall	700 Nicollet Mall	Minneapolis
Hilton Hotel Minneapolis	1001 Marquette Ave	Minneapolis
Wreck Brothers Auto Inc - Mpls	3749 Chicago Ave	Minneapolis
Quality Paint & Autobody Inc	3452 Lyndale Ave S	Minneapolis
The Nicollet	1001 Nicollet Ave	Minneapolis
Main Heating Plant	1180 Main St SE	Minneapolis
Pillsbury "A" Mill Complex	335 Main St SE	Minneapolis
Machinery Lofts	2848 Pleasant Ave	Minneapolis
Metro Transit Nicollet Garage - SW	10 32nd St W	Minneapolis
NRG Energy Center Minneapolis	816 S 4th Ave	Minneapolis
Dayton Rogers Manufacturing Co	2824 13th Ave S	Minneapolis
Acme Foundry Co	3161 Hiawatha Ave	Minneapolis
American Swedish Institute	2600 Park Ave S	Minneapolis
H&B Elevators Inc	2629 30th Ave S	Minneapolis
Superamerica #4232	3453 Nicollet Ave S	Minneapolis
Sidal Realty Co	2201 Blaisdell Ave S	Minneapolis
Vision Loss Resources	1936 Lyndale Ave S	Minneapolis
Andrew Residence Management Inc	1215 S 9th St	Minneapolis
Fifth Ave High Rise	2419 5th Ave S	Minneapolis
Juvenile Justice Center	626 S 6th St	Minneapolis
Holiday Stationstore #2	2124 E Franklin Ave	Minneapolis
SuperAmerica 4378	2445 Bloomington Ave S	Minneapolis
Us West Switching Station	3317 24th Ave S	Minneapolis
Atrium Apartments	314 Hennepin Ave	Minneapolis
Signe Burckhardt Manor	2533 1st Ave S	Minneapolis
MPHA Apartment Building	1515 Park Ave S	Minneapolis
Carlson Hall-north Central Univ	916 E 15th St	Minneapolis
Inter City Oil #95	2325 E 38th St	Minneapolis
Salem Lutheran Church	610 W 28th St	Minneapolis
Nicollet Towers	1350 Nicollet Mall	Minneapolis
Di Hed Yokes	3023 Snelling Ave S	Minneapolis
Cedar 94 Apartments	2220 E Franklin Ave	Minneapolis
Scheele Property	1849 E 38th St	Minneapolis
Mack Engineering Corp - Building I	3215 E 26th St	Minneapolis
Windsor Apartments	2011 3rd Ave S	Minneapolis
ADM Milling Co - Nokomis Flour Mill	3501 Hiawatha Ave	Minneapolis
Bituminous Roadways - Minneapolis	2825 Cedar Ave S	Minneapolis
Amigo Service Center - 3544 Lyndale	3544 Lyndale Ave S	Minneapolis
Atlantic Press Inc	3457 Chicago Ave	Minneapolis
Top Gear Autoworks	2401 E Lake St	Minneapolis
Bernie & Jims Amoco	300 S 10th St	Minneapolis
Bituminous Roadways - Longfellow Ave	2828 Longfellow Ave S	Minneapolis

TABLE D4 - WIMN - NO AIR PERMITS

Blake Upper School	511 Kenwood Pkwy	Minneapolis
Bryant Auto Repair	1716 E Lake St	Minneapolis
Brito Auto Paint LLC	3013 Pillsbury Ave S	Minneapolis
Car X Muffler Shops - Minneapolis	1001 W Lake St	Minneapolis
Childrens Dental Services	1098 Andersen Ln	Minneapolis
Clydes Service	1400 E 38th St	Minneapolis
Community Hospital Linen Service	201 Royalston Ave	Minneapolis
EDMC - Art Institutes Int MN	15 S 9th St	Minneapolis
East End Imports	2801 E Franklin Ave	Minneapolis
Elite Cleaners & Launderers	3101 Minnehaha Ave	Minneapolis
First Unitarian Society	900 Mount Curve Ave	Minneapolis
Franklin Amoco	2000 3rd Ave S	Minneapolis
Hennepin Avenue United Methodist	511 Groveland Ave	Minneapolis
Hennepin County Medical Center	701 Park Ave S	Minneapolis
Hopf & Hopf Printing Inc	2711 E Franklin Ave	Minneapolis
Industrial Electric Company	600 S 9th St	Minneapolis
Janesville Auto Transport Co	2700 26th Ave S	Minneapolis
Johnstech International	511 11th Ave S	Minneapolis
D&T Auto Repair Garage	3446 Bloomington Ave S	Minneapolis
Jr Import Service Inc	3700 Chicago Ave	Minneapolis
Kmart Store 3405	10 W Lake St	Minneapolis
Landry Transfer Inc	2515 23rd Ave S	Minneapolis
Lathrop Paint Supply Co Inc	2741 Hennepin Ave	Minneapolis
Lehmann Center	1006 W Lake St	Minneapolis
Longfellow Minneapolis Schools	3017 E 31st St	Minneapolis
Ludvigsons Al Standard	3551 Lyndale Ave S	Minneapolis
Merit Printing	117 N 2nd St	Minneapolis
Midas Muffler Lake St	601 E Lake St	Minneapolis
Miller Towing	2935 Pleasant Ave	Minneapolis
David's Auto Repair	4000 Bloomington Ave S	Minneapolis
Children's Health Care Hospital/Clinics	2525 Chicago Ave S	Minneapolis
Minneapolis city of	309 2nd Ave S	Minneapolis
Minneapolis Fire Department Stores	1858 E 27th St	Minneapolis
Nordquist Holdings LLC dba Nordquist Sign Co	312 W Lake St	Minneapolis
Opus Corp Powers Building	430 Marquette Ave	Minneapolis
Portland Lake Motors/Customs Body Repair	3005 5th Ave S	Minneapolis
Hennepin County Environmental Serv PPL	509 Washington Ave S	Minneapolis
Physicians & Surgeons Bldg	59 S 9th St	Minneapolis
Riverside Plaza	1610 S 6th St	Minneapolis
Midtown Exchange - 2929 Chicago	2929 Chicago Ave	Minneapolis
Seward Minneapolis Schools	2309 28th Ave S	Minneapolis
Sharpson Inc	2700 Hennepin Ave S	Minneapolis
Smith Bros Service Station Inc	409 S 9th St	Minneapolis
South High School Minneapolis Schools	3131 19th Ave S	Minneapolis
Madina's Automotive Inc	3701 Cedar Ave S	Minneapolis
Standard Machine Mold - Pleasant Ave	2942 Pleasant Ave	Minneapolis
Star Tribune	716 S 4th St	Minneapolis



TABLE D4 - WIMN - NO AIR PERMITS

Former SuperAmerica 4384	5 E Franklin Ave	Minneapolis
SuperAmerica 4388	101 W Grant St	Minneapolis
Theisen Vending Co - Mpls	3800 Nicollet Ave	Minneapolis
Tires Plus	3421 E Lake St	Minneapolis
Tires Plus Uptown 37	1103 W Lake St	Minneapolis
Trinity Apartments Corp	2800 E 31st St	Minneapolis
Minnegasco - U of M Meter Site	1180 Main St SE	Minneapolis
Usgsa United States General Serv Adm	212 3rd Ave S	Minneapolis
Wanner Engineering Inc	1204 Chestnut Ave	Minneapolis
West Lake Collision	515 W Lake St	Minneapolis
Hennepin County Energy Center	600 10th Ave S	Minneapolis
Gaviidae Common	651 Nicollet Mall	Minneapolis
Fairview Riverside Hospital Expansion	Riverside Ave and 24th Ave S	Minneapolis
Minneapolis Public Housing - Cedar Ave	620 Cedar Ave S	Minneapolis
Apartment Building	3521 Pleasant Ave	Minneapolis
Highpoint Center for Printmaking	912 Lake St W	Minneapolis
Riverview Towers	1920 1st St S	Minneapolis
Karen Larsen Property/Apartment Building	3220 Garfield Ave S	Minneapolis
U of M Bike Trail	BNSF Property	Minneapolis
Buzza Historic Lofts	1006 W Lake St	Minneapolis
1100 South 2nd Street Property	1100 S 2nd St	Minneapolis
Xcel Energy - Chestnut Service Center	1518 Chestnut Ave	Minneapolis
Wells Fargo Home Mortgage	2701 4th Ave S	Minneapolis
Pillsbury Center	200 S 6th St	Minneapolis
CVS Pharmacy 8285	1010 Lake St W	Minneapolis
Lerner Publications Co	241 1st Ave North Ste 1	Minneapolis
Tubs Inc	705 5th St N	Minneapolis
Roof Depot	1860 E 28th St	Minneapolis
The III AN Co LLC	2700 E 28th St Ste 120	Minneapolis
Earl Wickle & Sons Const Company	2514 24th Ave S	Minneapolis
Interface Graphics Inc	241 1st Ave N Ste B	Minneapolis
Minneapolis Youth Diversion Program	41 N 12th St	Minneapolis
ReliaStar Corporate Properties	111 Washington Ave S	Minneapolis
Boker's Inc	3104 Snelling Ave	Minneapolis
Shamrock Group	2900 5th Ave S	Minneapolis
Fuji Photo Film USA Inc - HHH Metrodome	900 S 5th St	Minneapolis
Jefferson Lines	2100 E 26th St	Minneapolis
Leder Brothers Co	3240 Snelling Ave	Minneapolis
Ellwood Automotive	3948 Nicollet Ave	Minneapolis
U of M - FTCEM	501 23rd Ave SE	Minneapolis
Firestone/Hawthorne	1100 Hawthorne Ave	Minneapolis
Bystrom Bros Inc	2200 Snelling Ave	Minneapolis
Bureau of Engraving Inc - 4th St	500 S 4th St	Minneapolis
Lasky Properties	1500 to 1544 Nicollet Ave S	Minneapolis
Hennepin Healthcare System Inc	SW of W28th St and Nicollet Ave S	Minneapolis
Calhoun Square	3001 Hennepin Ave S	Minneapolis
Uptown Rainbow Foods and Arbys	1104 Lagoon Ave and 1116 Lake St W	Minneapolis

TABLE D4 - WIMN - NO AIR PERMITS

Proposed Lunds on Hennepin	1201 1207 and 1213 Hennepin Ave	Minneapolis
Bennett East Parcel	2821 thru 2825 Dupont Av S	Minneapolis
MINNEGASCO OU-2 Groundwater	1406 West River Pkwy	Minneapolis
Commercial Property (koch)	2500 Minnehaha Ave	Minneapolis
Bethlehem Baptist Church	720 13th Ave S	Minneapolis
Individual Building	2525 Harriet Ave S	Minneapolis
Fire Station #17	821 E 35th St	Minneapolis
Phillps Community School	2300 Chicago Ave	Minneapolis
Lowe House	143 E 19th St	Minneapolis
Franklin Towers	1920 4th Ave S	Minneapolis
Hennepin County Medical Center Parking	626 Park Ave	Minneapolis
Holiday Stationstore #209	2448 Hennepin Ave	Minneapolis
Apartment Building	3500 Dupont Ave	Minneapolis
Apartment Building	3217 14th Ave S	Minneapolis
Stimson Building	704 Hennepin	Minneapolis
Old Greyhound Bus Depot	29 N 7th St	Minneapolis
University of MN Medical Center Fairview	608 25th Ave	Minneapolis
510 Groveland Associates	510 Groveland Ave	Minneapolis
Clausens Oil Co	22 E Franklin Ave S	Minneapolis
Mpls Auditorium & Convention Hall	1403 Stevens Ave S	Minneapolis
Minneapolis Moto Mart	3301 Hiawatha	Minneapolis
Oak Grove Towers	215 Oak Grove St	Minneapolis
Seward Towers East	2910 E Franklin	Minneapolis
Walker Place	3701 Bryant Ave S	Minneapolis
Charles L Horn Towers	115 W 31st St	Minneapolis
Hiawatha Towers Apartment	1700 E 22nd St	Minneapolis
Philip Wagenstien Bldg/health Sci (b/c)	516 Delaware St SE	Minneapolis
Norwest Bank-lake St	3030 Nicollet	Minneapolis
Buckingham Apartments (the)	1500 La Salle	Minneapolis
Minnehaha Courts	1901 Minnehaha Ave	Minneapolis
Cedar Lake Apartment	3121 Cedar Ave S	Minneapolis
Clara Doerr Club	1717 2nd Ave	Minneapolis
Central Lutheran Church	333 S 12th St	Minneapolis
Stanley Hall Court Apartments	2108 Pleasant	Minneapolis
Twin Court Apartments	611 W Ridgewood	Minneapolis
Best Apts	2008 Park Ave S	Minneapolis
Cedar Small Engine	3804 Cedar Ave S	Minneapolis
Dain Bosworth Plaza	60 S 6th St	Minneapolis
Augustana Lutheran Church	704 11th Ave S	Minneapolis
Bush Terrace Condominiums	4017 14th Ave S	Minneapolis
Cottle Properties	127 W Lake St	Minneapolis
Booth Manor	1421 Yale St	Minneapolis
Inner City Church	1812 Park Ave S	Minneapolis
Hotel Luxeford Suites	1101 LaSalle Ave	Minneapolis
Park Plaza Apartments	505 527 Humboldt Ave N	Minneapolis
U Of Mn Basic Sciences Building	312 Church St SE	Minneapolis
University Court Apartments	1414 S 3rd St	Minneapolis

TABLE D4 - WIMN - NO AIR PERMITS

Cathedral Church Of Saint Mark	519 Oak Grove St	Minneapolis
Special Education Center	2600 Grand Ave S	Minneapolis
Manangement And Economics Building	271 19th Ave S	Minneapolis
19th Avenue Parking Ramp	300 19th Ave S	Minneapolis
Marquette Place Apartments	1314 Marquette	Minneapolis
Native American Indian Center	1530 E Franklin Ave	Minneapolis
Mount Curve Apartments	1710 Bryant Ave	Minneapolis
Meci Convention Center Plant	125 W 15th St	Minneapolis
Baker Plant	706 2nd Ave S	Minneapolis
Valvoline Rapid Oil Change	2401 Hennepin Ave S	Minneapolis
718 North Washington Avenue Building	718 N Washington Ave	Minneapolis
Autopia	2311 Hennepin Ave S	Minneapolis
Miller Towing Inc	2935 Pleasant Ave S	Minneapolis
University Of Minnesota Mayo Building	420 Delaware St S E	Minneapolis
Hiawatha Towers Apartments	2019 16th Ave S	Minneapolis
City Of Minneapolis 3rd District	121 Glenwood Ave N	Minneapolis
Cedar High Apartments	630 Cedar Ave S	Minneapolis
Roof Depot Inc	1860 E 28th St	Minneapolis
Centerpoint Energy-groundwater Trtmt	1309 W River Pkwy	Minneapolis
Jacobs Trading Company	80 S 8th St #2900	Minneapolis
Metrodome Square Building	1010 S 7th St	Minneapolis
Eiethe Womans Club Of Minneapolis	410 Oak Grove St	Minneapolis
Dunbar Armored Shop	3026 Minnehaha Ave	Minneapolis
Ing	100 Washington Ave S Ste 1306	Minneapolis
University Of Mn Molecular/cell	420 SE Washington Ave	Minneapolis
Mn Council Of Churches	122 Franklin Ave W	Minneapolis
TCF Tower Building	121 S 8th St	Minneapolis
Norton Building	1905 Bluff St	Minneapolis
Level 3 Minneapolis MPLSMNF1	222 S Ninth St	Minneapolis
Level 3 Minneapolis MPLSMNA2	2800 E 34th St	Minneapolis
Ing Clarion Realty Services	100 S 5th St	Minneapolis
Calvary Baptist Church	2608 Blaisdale Ave S	Minneapolis
Dukes Cares & Towing	520 E Lake St	Minneapolis
Ford Deep Rock	See location description	Minneapolis
Milwaukee Road Depot	See location description	Minneapolis
Applause	2841 Hennepin Ave	Minneapolis
Urban Ventures II (Merc)	2900 & 2916 4th Ave S	Minneapolis
29th Street Corridor Tunnel	See Location Description	Minneapolis
Greenway Terrace Development	2850 Cedar Ave S	Minneapolis
HCRRA ROW	See Location Description	Minneapolis
Artcraft Press	907-929 Portland Ave S	Minneapolis
Anishinabe Bii-Gii-Wiin	Franklin Ave & Hiawatha Ave	Minneapolis
Lumen Building	See Location Description	Minneapolis
Parcel F	See location description	Minneapolis
Le Parisien - Lyndale	2301 Lyndale Ave S	Minneapolis
Hopf and Hopf Printing	2711 East Franklin Avenue	Minneapolis
Brekke Properties	See location description	Minneapolis

TABLE D4 - WIMN - NO AIR PERMITS		
Franklin Steele Commons Project	See location description	Minneapolis
MNDOT I35W Bridge	See location description	Minneapolis
Rail Support Facility	See location description	Minneapolis
U of M - Spill Properties	See location description	Minneapolis
White Way Cleaners #3	113 26th St E	Minneapolis
Eleventh Avenue Addition	See location description	Minneapolis
Eleventh Avenue Addition #3	1101 W River Parkway	Minneapolis
Minnehaha Mall #2 (Target)	2500 E Lake St	Minneapolis
MNDOT I35W Bridge - Norton Building	See location description	Minneapolis
MNDOT I35W Bridge - Center Point Energy	See location description	Minneapolis
MNDOT I35W Bridge - Minneapolis Park Board	See location description	Minneapolis
MNDOT I35W Bridge - U-CW Partnership LLP	See location description	Minneapolis
MNDOT I35W Bridge - City of Minneapolis	See location description	Minneapolis
Gas Holder #4 (U of M Underground Library OU1)	See location description	Minneapolis
Calhoun Square	3001 Hennepin Ave S	Minneapolis
CCLRT - U of M Campus (Sec. 2)	See location description	Minneapolis
Lyndale Avenue Gas Station	2752 Lyndale Ave S	Minneapolis
National Vitamin	See location description	Minneapolis
2605 2nd Avenue South	2605 2nd Ave S	Minneapolis
1316 East 24th Street	1316 E 24th St	Minneapolis
CenterPoint Energy - GWTF	1300 River Pkwy W Ste A	Minneapolis
Kwong Tung Foods Inc	1840 E 38th St	Minneapolis
Minneapolis Grain Exchange	400 S 4th St Ste 130	Minneapolis
Calco of Minneapolis	2751 Minnehaha Ave	Minneapolis
Met Council - Minneapolis Sewer System	Address Unknown	Minneapolis
Minneapolis Municipal Storm Water	350 S 5th St	Minneapolis

TABLE D5 - WIMN - NO CONSTRUCTION STORMWATER		
Site Name	Address	City
Photos Inc	2601 Minnehaha Ave S	Minneapolis
Ford Deep Rock	See location description	Minneapolis
Milwaukee Road Depot	See location description	Minneapolis
Applause	2841 Hennepin Ave	Minneapolis
Urban Ventures II (Merc)	2900 & 2916 4th Ave S	Minneapolis
Franklin Steele Commons Project	See location description	Minneapolis
Gas Holder #4 (U of M Underground Library OU1)	See location description	Minneapolis
Minnehaha Mall #2 (Target)	2500 E Lake St	Minneapolis
29th Street Corridor Tunnel	See Location Description	Minneapolis
HCRRA ROW	See Location Description	Minneapolis
Greenway Terrace Development	2850 Cedar Ave S	Minneapolis
White Way Cleaners #3	113 26th St E	Minneapolis
Artcraft Press	907-929 Portland Ave S	Minneapolis
Le Parisien - Lyndale	2301 Lyndale Ave S	Minneapolis
Anishinabe Bii-Gii-Wiin	Franklin Ave & Hiawatha Ave	Minneapolis
Parcel F	See location description	Minneapolis
Lumen Building	See Location Description	Minneapolis
Hopf and Hopf Printing	2711 East Franklin Avenue	Minneapolis
Brekke Properties	See location description	Minneapolis
MNDOT I35W Bridge	See location description	Minneapolis
MNDOT I35W Bridge - Norton Building	See location description	Minneapolis
MNDOT I35W Bridge - Center Point Energy	See location description	Minneapolis
MNDOT I35W Bridge - Minneapolis Park Board	See location description	Minneapolis
MNDOT I35W Bridge - Metal-Matic Inc.	See location description	Minneapolis
MNDOT I35W Bridge - U-CW Partnership LLP	See location description	Minneapolis
MNDOT I35W Bridge - City of Minneapolis	See location description	Minneapolis
Rail Support Facility	See location description	Minneapolis
U of M - Spill Properties	See location description	Minneapolis
Calhoun Square	3001 Hennepin Ave S	Minneapolis
CCLRT - U of M Campus (Sec. 2)	See location description	Minneapolis
Lyndale Avenue Gas Station	2752 Lyndale Ave S	Minneapolis
National Vitamin	See location description	Minneapolis
Eleventh Avenue Addition	See location description	Minneapolis
Eleventh Avenue Addition #3	1101 W River Parkway	Minneapolis
CCLRT - Civil West (Sec. 13 4)	See location description	Minneapolis
Nicollet Towers	1350 Nicollet Mall	Minneapolis
Bethlehem Baptist Church	720 13th Ave S	Minneapolis
Individual Building	2525 Harriet Ave S	Minneapolis
Fire Station #17	821 E 35th St	Minneapolis
Phillps Community School	2300 Chicago Ave	Minneapolis
Lowe House	143 E 19th St	Minneapolis
Franklin Towers	1920 4th Ave S	Minneapolis
Hennepin County Medical Center Parking	626 Park Ave	Minneapolis
Holiday Stationstore #209	2448 Hennepin Ave	Minneapolis
Apartment Building	3500 Dupont Ave	Minneapolis

TABLE D5 - WIMN - NO CONSTRUCTION STORMWATER		
Apartment Building	3217 14th Ave S	Minneapolis
Stimson Building	704 Hennepin	Minneapolis
Old Greyhound Bus Depot	29 N 7th St	Minneapolis
University of MN Medical Center Fairview	608 25th Ave	Minneapolis
510 Groveland Associates	510 Groveland Ave	Minneapolis
Clausens Oil Co	22 E Franklin Ave S	Minneapolis
Mpls Auditorium & Convention Hall	1403 Stevens Ave S	Minneapolis
Minneapolis Moto Mart	3301 Hiawatha	Minneapolis
Oak Grove Towers	215 Oak Grove St	Minneapolis
Seward Towers East	2910 E Franklin	Minneapolis
Walker Place	3701 Bryant Ave S	Minneapolis
Charles L Horn Towers	115 W 31st St	Minneapolis
Hiawatha Towers Apartment	1700 E 22nd St	Minneapolis
Philip Wagenstien Bldg/health Sci (b/c)	516 Delaware St SE	Minneapolis
Norwest Bank-lake St	3030 Nicollet	Minneapolis
Buckingham Apartments (the)	1500 La Salle	Minneapolis
Minnehaha Courts	1901 Minnehaha Ave	Minneapolis
Cedar Lake Apartment	3121 Cedar Ave S	Minneapolis
Clara Doerr Club	1717 2nd Ave	Minneapolis
Central Lutheran Church	333 S 12th St	Minneapolis
Stanley Hall Court Apartments	2108 Pleasant	Minneapolis
Twin Court Apartments	611 W Ridgewood	Minneapolis
Best Apts	2008 Park Ave S	Minneapolis
Cedar Small Engine	3804 Cedar Ave S	Minneapolis
Dain Bosworth Plaza	60 S 6th St	Minneapolis
Augustana Lutheran Church	704 11th Ave S	Minneapolis
Bush Terrace Condominiums	4017 14th Ave S	Minneapolis
Cottle Properties	127 W Lake St	Minneapolis
Booth Manor	1421 Yale St	Minneapolis
Park Plaza Apartments	505 527 Humboldt Ave N	Minneapolis
U Of Mn Basic Sciences Building	312 Church St SE	Minneapolis
University Court Apartments	1414 S 3rd St	Minneapolis
Hotel Luxeford Suites	1101 LaSalle Ave	Minneapolis
Cathedral Church Of Saint Mark	519 Oak Grove St	Minneapolis
Special Education Center	2600 Grand Ave S	Minneapolis
Manangement And Economics Building	271 19th Ave S	Minneapolis
19th Avenue Parking Ramp	300 19th Ave S	Minneapolis
Marquette Place Apartments	1314 Marquette	Minneapolis
Native American Indian Center	1530 E Franklin Ave	Minneapolis
Mount Curve Apartments	1710 Bryant Ave	Minneapolis
Meci Convention Center Plant	125 W 15th St	Minneapolis
Ing Clarion Realty Services	100 S 5th St	Minneapolis
Baker Plant	706 2nd Ave S	Minneapolis
Valvoline Rapid Oil Change	2401 Hennepin Ave S	Minneapolis
718 North Washington Avenue Building	718 N Washington Ave	Minneapolis
Autopia	2311 Hennepin Ave S	Minneapolis

TABLE D5 - WIMN - NO CONSTRUCTION STORMWATER		
Miller Towing Inc	2935 Pleasant Ave S	Minneapolis
University Of Minnesota Mayo Building	420 Delaware St S E	Minneapolis
Hiawatha Towers Apartments	2019 16th Ave S	Minneapolis
City Of Minneapolis 3rd District	121 Glenwood Ave N	Minneapolis
Cedar High Apartments	630 Cedar Ave S	Minneapolis
Roof Depot Inc	1860 E 28th St	Minneapolis
Centerpoint Energy-groundwater Trtmt	1309 W River Pkwy	Minneapolis
Jacobs Trading Company	80 S 8th St #2900	Minneapolis
Commercial Property (koch)	2500 Minnehaha Ave	Minneapolis
Metrodome Square Building	1010 S 7th St	Minneapolis
Eiethe Womans Club Of Minneapolis	410 Oak Grove St	Minneapolis
Dunbar Armored Shop	3026 Minnehaha Ave	Minneapolis
Ing	100 Washington Ave S Ste 1306	Minneapolis
University Of Mn Molecular/cell	420 SE Washington Ave	Minneapolis
Mn Council Of Churches	122 Franklin Ave W	Minneapolis
TCF Tower Building	121 S 8th St	Minneapolis
Norton Building	1905 Bluff St	Minneapolis
Level 3 Minneapolis MPLSMNF1	222 S Ninth St	Minneapolis
Level 3 Minneapolis MPLSMNA2	2800 E 34th St	Minneapolis
Calvary Baptist Church	2608 Blaisdale Ave S	Minneapolis
Inner City Church	1812 Park Ave S	Minneapolis
MINNEGASCO OU-2 Groundwater	1406 West River Pkwy	Minneapolis
Lasky Properties	1500 to 1544 Nicollet Ave S	Minneapolis
Hennepin Healthcare System Inc	SW of W28th St and Nicollet Ave S	Minneapolis
Calhoun Square	3001 Hennepin Ave S	Minneapolis
Uptown Rainbow Foods and Arbys	1104 Lagoon Ave and 1116 Lake St W	Minneapolis
Fairview Riverside Hospital Expansion	Riverside Ave and 24th Ave S	Minneapolis
JO Peterson Building	1501 Washington Ave S	Minneapolis
Former Gas Station	1931 Minnehaha Ave	Minneapolis
Hope Community Property	1931 Portland Ave S and E Franklin	Minneapolis
JPM Properties	3008 Hennepin Ave S	Minneapolis
SCI Management Property	3700 Nicollet Ave	Minneapolis
Lutheran Social Services	2414 Park Ave S	Minneapolis
French Antiques	3018 Lyndale Ave S	Minneapolis
Superior Design Landscapes	1785 Dupont Ave S	Minneapolis
Valspar Research Lab	312 11th Ave S	Minneapolis
Proposed HHS Clinic	11 28th St W	Minneapolis
First Commercial Bank Property	1204 Lake St E	Minneapolis
Baker Investments 1 LLP Property	409 Marquette Ave	Minneapolis
Minnehaha Realty Group LLC Property	2450 Minnehaha Ave	Minneapolis
REM Hennepin Property	2548 Pleasant Ave S	Minneapolis
Former Franklin Avenue Gas Station	1120 E Franklin Ave	Minneapolis
Fairview Riverside Hospital	2450 Riverside Ave	Minneapolis
Carlson School Expansion Site	1901 4th St SE	Minneapolis
Machinery Lofts	2848 Pleasant Ave	Minneapolis
Dayton Rogers Manufacturing Co	2824 13th Ave S	Minneapolis



TABLE D5 - WIMN - NO CONSTRUCTION STORMWATER		
Superamerica #4232	3453 Nicollet Ave S	Minneapolis
Sidal Realty Co	2201 Blaisdell Ave S	Minneapolis
Vision Loss Resources	1936 Lyndale Ave S	Minneapolis
Fifth Ave High Rise	2419 5th Ave S	Minneapolis
Juvenile Justice Center	626 S 6th St	Minneapolis
Holiday Stationstore #2	2124 E Franklin Ave	Minneapolis
SuperAmerica 4378	2445 Bloomington Ave S	Minneapolis
Us West Switching Station	3317 24th Ave S	Minneapolis
Atrium Apartments	314 Hennepin Ave	Minneapolis
Signe Burckhardt Manor	2533 1st Ave S	Minneapolis
MPHA Apartment Building	1515 Park Ave S	Minneapolis
Carlson Hall-north Central Univ	916 E 15th St	Minneapolis
Inter City Oil #95	2325 E 38th St	Minneapolis
Salem Lutheran Church	610 W 28th St	Minneapolis
Di Hed Yokes	3023 Snelling Ave S	Minneapolis
Cedar 94 Apartments	2220 E Franklin Ave	Minneapolis
Scheele Property	1849 E 38th St	Minneapolis
Windsor Apartments	2011 3rd Ave S	Minneapolis
Apartment Building	3521 Pleasant Ave	Minneapolis
Riverview Towers	1920 1st St S	Minneapolis
Karen Larsen Property/Apartment Building	3220 Garfield Ave S	Minneapolis
Main Heating Plant	1180 Main St SE	Minneapolis
Pillsbury "A" Mill Complex	335 Main St SE	Minneapolis
Ellwood Automotive	3948 Nicollet Ave	Minneapolis
Metro Transit Nicollet Garage - SW	10 32nd St W	Minneapolis
U of M - FTCEM	501 23rd Ave SE	Minneapolis
Minneapolis Public Library	310 Nicollet Mall	Minneapolis
The Nicollet	1001 Nicollet Ave	Minneapolis
Standard Machine Mold - Pleasant Ave	2942 Pleasant Ave	Minneapolis
Minnegasco - U of M Meter Site	1180 Main St SE	Minneapolis
Highpoint Center for Printmaking	912 Lake St W	Minneapolis
Hilton Hotel Minneapolis	1001 Marquette Ave	Minneapolis
Andrew Residence Management Inc	1215 S 9th St	Minneapolis
Top Gear Autoworks	2401 E Lake St	Minneapolis
Bituminous Roadways - Longfellow Ave	2828 Longfellow Ave S	Minneapolis
Brito Auto Paint LLC	3013 Pillsbury Ave S	Minneapolis
Childrens Dental Services	1098 Andersen Ln	Minneapolis
Clydes Service	1400 E 38th St	Minneapolis
Community Hospital Linen Service	201 Royalston Ave	Minneapolis
EDMC - Art Institutes Int MN	15 S 9th St	Minneapolis
East End Imports	2801 E Franklin Ave	Minneapolis
Franklin Amoco	2000 3rd Ave S	Minneapolis
Kmart Store 3405	10 W Lake St	Minneapolis
Landry Transfer Inc	2515 23rd Ave S	Minneapolis
Lathrop Paint Supply Co Inc	2741 Hennepin Ave	Minneapolis
Longfellow Minneapolis Schools	3017 E 31st St	Minneapolis



TABLE D5 - WIMN - NO CONSTRUCTION STORMWATER		
Midas Muffler Lake St	601 E Lake St	Minneapolis
Minneapolis city of	309 2nd Ave S	Minneapolis
Minneapolis Fire Department Stores	1858 E 27th St	Minneapolis
Opus Corp Powers Building	430 Marquette Ave	Minneapolis
Portland Lake Motors/Customs Body Repair	3005 5th Ave S	Minneapolis
Physicians & Surgeons Bldg	59 S 9th St	Minneapolis
Seward Minneapolis Schools	2309 28th Ave S	Minneapolis
Sharpson Inc	2700 Hennepin Ave S	Minneapolis
Madina's Automotive Inc	3701 Cedar Ave S	Minneapolis
Star Tribune	716 S 4th St	Minneapolis
Tires Plus	3421 E Lake St	Minneapolis
Tires Plus Uptown 37	1103 W Lake St	Minneapolis
Trinity Apartments Corp	2800 E 31st St	Minneapolis
Usgsa United States General Serv Adm	212 3rd Ave S	Minneapolis
West Lake Collision	515 W Lake St	Minneapolis
Minneapolis Public Housing - Cedar Ave	620 Cedar Ave S	Minneapolis
ReliaStar Corporate Properties	111 Washington Ave S	Minneapolis
Fuji Photo Film USA Inc - HHH Metrodome	900 S 5th St	Minneapolis
Firestone/Hawthorne	1100 Hawthorne Ave	Minneapolis
Roof Depot	1860 E 28th St	Minneapolis
Industrial Electric Company	600 S 9th St	Minneapolis
Miller Towing	2935 Pleasant Ave	Minneapolis
Riverside Plaza	1610 S 6th St	Minneapolis
Shamrock Group	2900 5th Ave S	Minneapolis
Theisen Vending Co - Mpls	3800 Nicollet Ave	Minneapolis
Amigo Service Center - 3544 Lyndale	3544 Lyndale Ave S	Minneapolis
Bernie & Jims Amoco	300 S 10th St	Minneapolis
Blake Upper School	511 Kenwood Pkwy	Minneapolis
Bryant Auto Repair	1716 E Lake St	Minneapolis
Car X Muffler Shops - Minneapolis	1001 W Lake St	Minneapolis
First Unitarian Society	900 Mount Curve Ave	Minneapolis
Hennepin Avenue United Methodist	511 Groveland Ave	Minneapolis
Hopf & Hopf Printing Inc	2711 E Franklin Ave	Minneapolis
Janesville Auto Transport Co	2700 26th Ave S	Minneapolis
Johnstech International	511 11th Ave S	Minneapolis
D&T Auto Repair Garage	3446 Bloomington Ave S	Minneapolis
Jr Import Service Inc	3700 Chicago Ave	Minneapolis
Lehmann Center	1006 W Lake St	Minneapolis
Ludvigsons AI Standard	3551 Lyndale Ave S	Minneapolis
David's Auto Repair	4000 Bloomington Ave S	Minneapolis
Hennepin County Environmental Serv PPL	509 Washington Ave S	Minneapolis
Midtown Exchange - 2929 Chicago	2929 Chicago Ave	Minneapolis
Smith Bros Service Station Inc	409 S 9th St	Minneapolis
South High School Minneapolis Schools	3131 19th Ave S	Minneapolis
Former SuperAmerica 4384	5 E Franklin Ave	Minneapolis
SuperAmerica 4388	101 W Grant St	Minneapolis

TABLE D5 - WIMN - NO CONSTRUCTION STORMWATER		
CVS Pharmacy 8285	1010 Lake St W	Minneapolis
The III AN Co LLC	2700 E 28th St Ste 120	Minneapolis
Minneapolis Youth Diversion Program	41 N 12th St	Minneapolis
Earl Wiekke & Sons Const Company	2514 24th Ave S	Minneapolis
Tubs Inc	705 5th St N	Minneapolis
Jefferson Lines	2100 E 26th St	Minneapolis
Leder Brothers Co	3240 Snelling Ave	Minneapolis
Boker's Inc	3104 Snelling Ave	Minneapolis
Wanner Engineering Inc	1204 Chestnut Ave	Minneapolis
Hennepin County Medical Center	701 Park Ave S	Minneapolis
American Swedish Institute	2600 Park Ave S	Minneapolis
Velocity Technology Solutions Inc	1200 Washington Ave S Ste 200	Minneapolis
Macy's Department Store Nicollet Mall	700 Nicollet Mall	Minneapolis
Pillsbury Center	200 S 6th St	Minneapolis
Quality Paint & Autobody Inc	3452 Lyndale Ave S	Minneapolis
NRG Energy Center Minneapolis	816 S 4th Ave	Minneapolis
Children's Health Care Hospital/Clinics	2525 Chicago Ave S	Minneapolis
Bureau of Engraving Inc - 4th St	500 S 4th St	Minneapolis
Hennepin County Energy Center	600 10th Ave S	Minneapolis
Wells Fargo Home Mortgage	2701 4th Ave S	Minneapolis
ADM Milling Co - Nokomis Flour Mill	3501 Hiawatha Ave	Minneapolis
Bystrom Bros Inc	2200 Snelling Ave	Minneapolis
Xcel Energy - Chestnut Service Center	1518 Chestnut Ave	Minneapolis
VTF Properties Apartment Complex	1941 Fremont Ave S	Minneapolis
Former Gas Station	3610 Lyndale Ave S	Minneapolis
312 Partnership LLC Property	312 S 3rd St	Minneapolis
U of M Bike Trail	BNSF Property	Minneapolis
Buzza Historic Lofts	1006 W Lake St	Minneapolis
1100 South 2nd Street Property	1100 S 2nd St	Minneapolis
Proposed Lunds on Hennepin	1201 1207 and 1213 Hennepin Ave	Minneapolis
Bennett East Parcel	2821 thru 2825 Dupont Av S	Minneapolis
Dukes Cares & Towing	520 E Lake St	Minneapolis
2605 2nd Avenue South	2605 2nd Ave S	Minneapolis
1316 East 24th Street	1316 E 24th St	Minneapolis

TABLE D6 - WIMN - NO TANKS

Site Name	Address	City
312 Partnership LLC Property	312 S 3rd St	Minneapolis
JO Peterson Building	1501 Washington Ave S	Minneapolis
Former Gas Station	1931 Minnehaha Ave	Minneapolis
Hope Community Property	1931 Portland Ave S and E Franklin	Minneapolis
JPM Properties	3008 Hennepin Ave S	Minneapolis
SCI Management Property	3700 Nicollet Ave	Minneapolis
Lutheran Social Services	2414 Park Ave S	Minneapolis
French Antiques	3018 Lyndale Ave S	Minneapolis
Superior Design Landscapes	1785 Dupont Ave S	Minneapolis
Valspar Research Lab	312 11th Ave S	Minneapolis
Proposed HHS Clinic	11 28th St W	Minneapolis
First Commercial Bank Property	1204 Lake St E	Minneapolis
Baker Investments 1 LLP Property	409 Marquette Ave	Minneapolis
Minnehaha Realty Group LLC Property	2450 Minnehaha Ave	Minneapolis
REM Hennepin Property	2548 Pleasant Ave S	Minneapolis
Former Franklin Avenue Gas Station	1120 E Franklin Ave	Minneapolis
Fairview Riverside Hospital	2450 Riverside Ave	Minneapolis
Carlson School Expansion Site	1901 4th St SE	Minneapolis
VTF Properties Apartment Complex	1941 Fremont Ave S	Minneapolis
Former Gas Station	3610 Lyndale Ave S	Minneapolis
Fairview Riverside Hospital Expansion	Riverside Ave and 24th Ave S	Minneapolis
Machinery Lofts	2848 Pleasant Ave	Minneapolis
Dayton Rogers Manufacturing Co	2824 13th Ave S	Minneapolis
Superamerica #4232	3453 Nicollet Ave S	Minneapolis
Sidal Realty Co	2201 Blaisdell Ave S	Minneapolis
Vision Loss Resources	1936 Lyndale Ave S	Minneapolis
Fifth Ave High Rise	2419 5th Ave S	Minneapolis
Juvenile Justice Center	626 S 6th St	Minneapolis
Holiday Stationstore #2	2124 E Franklin Ave	Minneapolis
SuperAmerica 4378	2445 Bloomington Ave S	Minneapolis
Us West Switching Station	3317 24th Ave S	Minneapolis
Atrium Apartments	314 Hennepin Ave	Minneapolis
Signe Burckhardt Manor	2533 1st Ave S	Minneapolis
MPHA Apartment Building	1515 Park Ave S	Minneapolis
Carlson Hall-north Central Univ	916 E 15th St	Minneapolis
Inter City Oil #95	2325 E 38th St	Minneapolis
Salem Lutheran Church	610 W 28th St	Minneapolis
Di Hed Yokes	3023 Snelling Ave S	Minneapolis
Cedar 94 Apartments	2220 E Franklin Ave	Minneapolis
Scheele Property	1849 E 38th St	Minneapolis
Windsor Apartments	2011 3rd Ave S	Minneapolis
Apartment Building	3521 Pleasant Ave	Minneapolis
Riverview Towers	1920 1st St S	Minneapolis
Karen Larsen Property/Apartment Building	3220 Garfield Ave S	Minneapolis
Main Heating Plant	1180 Main St SE	Minneapolis

TABLE D6 - WIMN - NO TANKS		
Pillsbury "A" Mill Complex	335 Main St SE	Minneapolis
Metro Transit Nicollet Garage - SW	10 32nd St W	Minneapolis
U of M - FTCEM	501 23rd Ave SE	Minneapolis
Minneapolis Public Library	310 Nicollet Mall	Minneapolis
The Nicollet	1001 Nicollet Ave	Minneapolis
Standard Machine Mold - Pleasant Ave	2942 Pleasant Ave	Minneapolis
Highpoint Center for Printmaking	912 Lake St W	Minneapolis
Roof Depot	1860 E 28th St	Minneapolis
Industrial Electric Company	600 S 9th St	Minneapolis
Miller Towing	2935 Pleasant Ave	Minneapolis
Riverside Plaza	1610 S 6th St	Minneapolis
Shamrock Group	2900 5th Ave S	Minneapolis
Theisen Vending Co - Mpls	3800 Nicollet Ave	Minneapolis
Amigo Service Center - 3544 Lyndale	3544 Lyndale Ave S	Minneapolis
Bernie & Jims Amoco	300 S 10th St	Minneapolis
Blake Upper School	511 Kenwood Pkwy	Minneapolis
Bryant Auto Repair	1716 E Lake St	Minneapolis
Car X Muffler Shops - Minneapolis	1001 W Lake St	Minneapolis
First Unitarian Society	900 Mount Curve Ave	Minneapolis
Hennepin Avenue United Methodist	511 Groveland Ave	Minneapolis
Hopf & Hopf Printing Inc	2711 E Franklin Ave	Minneapolis
Janesville Auto Transport Co	2700 26th Ave S	Minneapolis
Johnstech International	511 11th Ave S	Minneapolis
D&T Auto Repair Garage	3446 Bloomington Ave S	Minneapolis
Jr Import Service Inc	3700 Chicago Ave	Minneapolis
Lehmann Center	1006 W Lake St	Minneapolis
Ludvigsons AI Standard	3551 Lyndale Ave S	Minneapolis
David's Auto Repair	4000 Bloomington Ave S	Minneapolis
Hennepin County Environmental Serv PPL	509 Washington Ave S	Minneapolis
Midtown Exchange - 2929 Chicago	2929 Chicago Ave	Minneapolis
Smith Bros Service Station Inc	409 S 9th St	Minneapolis
South High School Minneapolis Schools	3131 19th Ave S	Minneapolis
Former SuperAmerica 4384	5 E Franklin Ave	Minneapolis
SuperAmerica 4388	101 W Grant St	Minneapolis
CVS Pharmacy 8285	1010 Lake St W	Minneapolis
The III AN Co LLC	2700 E 28th St Ste 120	Minneapolis
Minneapolis Youth Diversion Program	41 N 12th St	Minneapolis
Earl Wiekke & Sons Const Company	2514 24th Ave S	Minneapolis
Tubs Inc	705 5th St N	Minneapolis
Leder Brothers Co	3240 Snelling Ave	Minneapolis
Boker's Inc	3104 Snelling Ave	Minneapolis
Wanner Engineering Inc	1204 Chestnut Ave	Minneapolis
Hennepin County Medical Center	701 Park Ave S	Minneapolis
American Swedish Institute	2600 Park Ave S	Minneapolis
Quality Paint & Autobody Inc	3452 Lyndale Ave S	Minneapolis
NRG Energy Center Minneapolis	816 S 4th Ave	Minneapolis

TABLE D6 - WIMN - NO TANKS		
Children's Health Care Hospital/Clinics	2525 Chicago Ave S	Minneapolis
Bureau of Engraving Inc - 4th St	500 S 4th St	Minneapolis
Hennepin County Energy Center	600 10th Ave S	Minneapolis
Wells Fargo Home Mortgage	2701 4th Ave S	Minneapolis
ADM Milling Co - Nokomis Flour Mill	3501 Hiawatha Ave	Minneapolis
Bystrom Bros Inc	2200 Snelling Ave	Minneapolis
Xcel Energy - Chestnut Service Center	1518 Chestnut Ave	Minneapolis
U of M Bike Trail	BNSF Property	Minneapolis
Buzza Historic Lofts	1006 W Lake St	Minneapolis
1100 South 2nd Street Property	1100 S 2nd St	Minneapolis
Lasky Properties	1500 to 1544 Nicollet Ave S	Minneapolis
Hennepin Healthcare System Inc	SW of W28th St and Nicollet Ave S	Minneapolis
Calhoun Square	3001 Hennepin Ave S	Minneapolis
Uptown Rainbow Foods and Arbys	1104 Lagoon Ave and 1116 Lake St W	Minneapolis
Proposed Lunds on Hennepin	1201 1207 and 1213 Hennepin Ave	Minneapolis
Bennett East Parcel	2821 thru 2825 Dupont Av S	Minneapolis
MINNEGASCO OU-2 Groundwater	1406 West River Pkwy	Minneapolis
Photos Inc	2601 Minnehaha Ave S	Minneapolis
Ford Deep Rock	See location description	Minneapolis
Milwaukee Road Depot	See location description	Minneapolis
Applause	2841 Hennepin Ave	Minneapolis
Urban Ventures II (Merc)	2900 & 2916 4th Ave S	Minneapolis
Franklin Steele Commons Project	See location description	Minneapolis
Gas Holder #4 (U of M Underground Library OU1)	See location description	Minneapolis
Minnehaha Mall #2 (Target)	2500 E Lake St	Minneapolis
29th Street Corridor Tunnel	See Location Description	Minneapolis
HCRRRA ROW	See Location Description	Minneapolis
Greenway Terrace Development	2850 Cedar Ave S	Minneapolis
White Way Cleaners #3	113 26th St E	Minneapolis
Artcraft Press	907-929 Portland Ave S	Minneapolis
Le Parisien - Lyndale	2301 Lyndale Ave S	Minneapolis
Anishinabe Bii-Gii-Wiin	Franklin Ave & Hiawatha Ave	Minneapolis
Parcel F	See location description	Minneapolis
Lumen Building	See Location Description	Minneapolis
Hopf and Hopf Printing	2711 East Franklin Avenue	Minneapolis
Brekke Properties	See location description	Minneapolis
MNDOT I35W Bridge	See location description	Minneapolis
MNDOT I35W Bridge - Norton Building	See location description	Minneapolis
MNDOT I35W Bridge - Center Point Energy	See location description	Minneapolis
MNDOT I35W Bridge - Minneapolis Park Board	See location description	Minneapolis
MNDOT I35W Bridge - Metal-Matic Inc.	See location description	Minneapolis
MNDOT I35W Bridge - U-CW Partnership LLP	See location description	Minneapolis
MNDOT I35W Bridge - City of Minneapolis	See location description	Minneapolis
Rail Support Facility	See location description	Minneapolis
U of M - Spill Properties	See location description	Minneapolis
Calhoun Square	3001 Hennepin Ave S	Minneapolis

TABLE D6 - WIMN - NO TANKS		
CCLRT - U of M Campus (Sec. 2)	See location description	Minneapolis
Lyndale Avenue Gas Station	2752 Lyndale Ave S	Minneapolis
National Vitamin	See location description	Minneapolis
2605 2nd Avenue South	2605 2nd Ave S	Minneapolis
1316 East 24th Street	1316 E 24th St	Minneapolis
Eleventh Avenue Addition	See location description	Minneapolis
Eleventh Avenue Addition #3	1101 W River Parkway	Minneapolis
CCLRT - Civil West (Sec. 13 4)	See location description	Minneapolis

TABLE D7 - WIMN - CLOSED LEAKSITES REMOVED				
Site Name	Address	City	County	Activity
JO Peterson Building	1501 Washington Ave S	Minneapolis	Hennepin	Leak Site
Former Gas Station	1931 Minnehaha Ave	Minneapolis	Hennepin	Leak Site
Hope Community Property	1931 Portland Ave S and E Franklin	Minneapolis	Hennepin	Leak Site
JPM Properties	3008 Hennepin Ave S	Minneapolis	Hennepin	Leak Site
SCI Management Property	3700 Nicollet Ave	Minneapolis	Hennepin	Leak Site
Lutheran Social Services	2414 Park Ave S	Minneapolis	Hennepin	Leak Site
French Antiques	3018 Lyndale Ave S	Minneapolis	Hennepin	Leak Site
Superior Design Landscapes	1785 Dupont Ave S	Minneapolis	Hennepin	Leak Site
Valspar Research Lab	312 11th Ave S	Minneapolis	Hennepin	Leak Site
Proposed HHS Clinic	11 28th St W	Minneapolis	Hennepin	Leak Site
First Commercial Bank Property	1204 Lake St E	Minneapolis	Hennepin	Leak Site
Baker Investments 1 LLP Property	409 Marquette Ave	Minneapolis	Hennepin	Leak Site
Minnehaha Realty Group LLC Property	2450 Minnehaha Ave	Minneapolis	Hennepin	Leak Site
REM Hennepin Property	2548 Pleasant Ave S	Minneapolis	Hennepin	Leak Site
Former Franklin Avenue Gas Station	1120 E Franklin Ave	Minneapolis	Hennepin	Leak Site
Fairview Riverside Hospital	2450 Riverside Ave	Minneapolis	Hennepin	Leak Site
Carlson School Expansion Site	1901 4th St SE	Minneapolis	Hennepin	Leak Site
VTF Properties Apartment Complex	1941 Fremont Ave S	Minneapolis	Hennepin	Leak Site
Former Gas Station	3610 Lyndale Ave S	Minneapolis	Hennepin	Leak Site
312 Partnership LLC Property	312 S 3rd St	Minneapolis	Hennepin	Leak Site
Fairview Riverside Hospital Expansion	Riverside Ave and 24th Ave S	Minneapolis	Hennepin	Multiple Activities
Machinery Lofts	2848 Pleasant Ave	Minneapolis	Hennepin	Multiple Activities
Dayton Rogers Manufacturing Co	2824 13th Ave S	Minneapolis	Hennepin	Multiple Activities
SuperAmerica #4232	3453 Nicollet Ave S	Minneapolis	Hennepin	Multiple Activities
Sidal Realty Co	2201 Blaisdell Ave S	Minneapolis	Hennepin	Multiple Activities
Vision Loss Resources	1936 Lyndale Ave S	Minneapolis	Hennepin	Multiple Activities
Fifth Ave High Rise	2419 5th Ave S	Minneapolis	Hennepin	Multiple Activities
Juvenile Justice Center	626 S 6th St	Minneapolis	Hennepin	Multiple Activities
Holiday Stationstore #2	2124 E Franklin Ave	Minneapolis	Hennepin	Multiple Activities
SuperAmerica 4378	2445 Bloomington Ave S	Minneapolis	Hennepin	Multiple Activities
Us West Switching Station	3317 24th Ave S	Minneapolis	Hennepin	Multiple Activities
Atrium Apartments	314 Hennepin Ave	Minneapolis	Hennepin	Multiple Activities
Signe Burckhardt Manor	2533 1st Ave S	Minneapolis	Hennepin	Multiple Activities
MPHA Apartment Building	1515 Park Ave S	Minneapolis	Hennepin	Multiple Activities
Carlson Hall-north Central Univ	916 E 15th St	Minneapolis	Hennepin	Multiple Activities
Inter City Oil #95	2325 E 38th St	Minneapolis	Hennepin	Multiple Activities
Salem Lutheran Church	610 W 28th St	Minneapolis	Hennepin	Multiple Activities
Di Hed Yokes	3023 Snelling Ave S	Minneapolis	Hennepin	Multiple Activities
Cedar 94 Apartments	2220 E Franklin Ave	Minneapolis	Hennepin	Multiple Activities
Scheele Property	1849 E 38th St	Minneapolis	Hennepin	Multiple Activities
Windsor Apartments	2011 3rd Ave S	Minneapolis	Hennepin	Multiple Activities
Apartment Building	3521 Pleasant Ave	Minneapolis	Hennepin	Multiple Activities
Riverview Towers	1920 1st St S	Minneapolis	Hennepin	Multiple Activities
Karen Larsen Property/Apartment Building	3220 Garfield Ave S	Minneapolis	Hennepin	Multiple Activities
Main Heating Plant	1180 Main St SE	Minneapolis	Hennepin	Multiple Activities
Pillsbury "A" Mill Complex	335 Main St SE	Minneapolis	Hennepin	Multiple Activities
Metro Transit Nicollet Garage - SW	10 32nd St W	Minneapolis	Hennepin	Multiple Activities
Minneapolis Public Library	310 Nicollet Mall	Minneapolis	Hennepin	Multiple Activities
The Nicollet	1001 Nicollet Ave	Minneapolis	Hennepin	Multiple Activities
Standard Machine Mold - Pleasant Ave	2942 Pleasant Ave	Minneapolis	Hennepin	Multiple Activities
Minnegasco - U of M Meter Site	1180 Main St SE	Minneapolis	Hennepin	Multiple Activities
Highpoint Center for Printmaking	912 Lake St W	Minneapolis	Hennepin	Multiple Activities
Roof Depot	1860 E 28th St	Minneapolis	Hennepin	Multiple Activities
Industrial Electric Company	600 S 9th St	Minneapolis	Hennepin	Multiple Activities
Miller Towing	2935 Pleasant Ave	Minneapolis	Hennepin	Multiple Activities
Riverside Plaza	1610 S 6th St	Minneapolis	Hennepin	Multiple Activities
Shamrock Group	2900 5th Ave S	Minneapolis	Hennepin	Multiple Activities
Theisen Vending Co - Mpls	3800 Nicollet Ave	Minneapolis	Hennepin	Multiple Activities
Amigo Service Center - 3544 Lyndale	3544 Lyndale Ave S	Minneapolis	Hennepin	Multiple Activities
Bernie & Jims Amoco	300 S 10th St	Minneapolis	Hennepin	Multiple Activities
Blake Upper School	511 Kenwood Pkwy	Minneapolis	Hennepin	Multiple Activities
Bryant Auto Repair	1716 E Lake St	Minneapolis	Hennepin	Multiple Activities
Car X Muffler Shops - Minneapolis	1001 W Lake St	Minneapolis	Hennepin	Multiple Activities
First Unitarian Society	900 Mount Curve Ave	Minneapolis	Hennepin	Multiple Activities
Hennepin Avenue United Methodist	511 Groveland Ave	Minneapolis	Hennepin	Multiple Activities
Hopf & Hopf Printing Inc	2711 E Franklin Ave	Minneapolis	Hennepin	Multiple Activities
Janesville Auto Transport Co	2700 26th Ave S	Minneapolis	Hennepin	Multiple Activities
Johnstech International	511 11th Ave S	Minneapolis	Hennepin	Multiple Activities
D&T Auto Repair Garage	3446 Bloomington Ave S	Minneapolis	Hennepin	Multiple Activities
Jr Import Service Inc	3700 Chicago Ave	Minneapolis	Hennepin	Multiple Activities
Lehmann Center	1006 W Lake St	Minneapolis	Hennepin	Multiple Activities
Ludvigsons Al Standard	3551 Lyndale Ave S	Minneapolis	Hennepin	Multiple Activities
David's Auto Repair	4000 Bloomington Ave S	Minneapolis	Hennepin	Multiple Activities
Hennepin County Environmental Serv PPL	509 Washington Ave S	Minneapolis	Hennepin	Multiple Activities
Midtown Exchange - 2929 Chicago	2929 Chicago Ave	Minneapolis	Hennepin	Multiple Activities
Smith Bros Service Station Inc	409 S 9th St	Minneapolis	Hennepin	Multiple Activities
South High School Minneapolis Schools	3131 19th Ave S	Minneapolis	Hennepin	Multiple Activities
Former SuperAmerica 4384	5 E Franklin Ave	Minneapolis	Hennepin	Multiple Activities
SuperAmerica 4388	101 W Grant St	Minneapolis	Hennepin	Multiple Activities
CVS Pharmacy 8285	1010 Lake St W	Minneapolis	Hennepin	Multiple Activities
The III AN Co LLC	2700 E 28th St Ste 120	Minneapolis	Hennepin	Multiple Activities
Minneapolis Youth Diversion Program	41 N 12th St	Minneapolis	Hennepin	Multiple Activities



TABLE D7 - WIMN - CLOSED LEAKSITES REMOVED				
Earl Wiekie & Sons Const Company	2514 24th Ave S	Minneapolis	Hennepin	Multiple Activities
Tubs Inc	705 5th St N	Minneapolis	Hennepin	Multiple Activities
Leder Brothers Co	3240 Snelling Ave	Minneapolis	Hennepin	Multiple Activities
Boker's Inc	3104 Snelling Ave	Minneapolis	Hennepin	Multiple Activities
Wanner Engineering Inc	1204 Chestnut Ave	Minneapolis	Hennepin	Multiple Activities
Hennepin County Medical Center	701 Park Ave S	Minneapolis	Hennepin	Multiple Activities
American Swedish Institute	2600 Park Ave S	Minneapolis	Hennepin	Multiple Activities
Quality Paint & Autobody Inc	3452 Lyndale Ave S	Minneapolis	Hennepin	Multiple Activities
NRG Energy Center Minneapolis	816 S 4th Ave	Minneapolis	Hennepin	Multiple Activities
Children's Health Care Hospital/Clinics	2525 Chicago Ave S	Minneapolis	Hennepin	Multiple Activities
Bureau of Engraving Inc - 4th St	500 S 4th St	Minneapolis	Hennepin	Multiple Activities
Hennepin County Energy Center	600 10th Ave S	Minneapolis	Hennepin	Multiple Activities
Wells Fargo Home Mortgage	2701 4th Ave S	Minneapolis	Hennepin	Multiple Activities
ADM Milling Co - Nokomis Flour Mill	3501 Hiawatha Ave	Minneapolis	Hennepin	Multiple Activities
Bystrom Bros Inc	2200 Snelling Ave	Minneapolis	Hennepin	Multiple Activities
Xcel Energy - Chestnut Service Center	1518 Chestnut Ave	Minneapolis	Hennepin	Multiple Activities
U of M Bike Trail	BNSF Property	Minneapolis	Hennepin	Multiple Activities
Buza Historic Lofts	1006 W Lake St	Minneapolis	Hennepin	Multiple Activities
1100 South 2nd Street Property	1100 S 2nd St	Minneapolis	Hennepin	Multiple Activities
Lasky Properties	1500 to 1544 Nicollet Ave S	Minneapolis	Hennepin	Petroleum Brownfield
Hennepin Healthcare System Inc	SW of W28th St and Nicollet Ave S	Minneapolis	Hennepin	Petroleum Brownfield
Calhoun Square	3001 Hennepin Ave S	Minneapolis	Hennepin	Petroleum Brownfield
Uptown Rainbow Foods and Arbys	1104 Lagoon Ave and 1116 Lake St W	Minneapolis	Hennepin	Petroleum Brownfield
Proposed Lunds on Hennepin	1201 1207 and 1213 Hennepin Ave	Minneapolis	Hennepin	Petroleum Brownfield
Bennett East Parcel	2821 thru 2825 Dupont Av S	Minneapolis	Hennepin	Petroleum Brownfield
MINNEGASCO OU-2 Groundwater	1406 West River Pkwy	Minneapolis	Hennepin	Superfund Project
Photos Inc	2601 Minnehaha Ave S	Minneapolis	Hennepin	Voluntary Investigation & Cleanup (VIC)
Ford Deep Rock	See location description	Minneapolis	Hennepin	Voluntary Investigation & Cleanup (VIC)
Milwaukee Road Depot	See location description	Minneapolis	Hennepin	Voluntary Investigation & Cleanup (VIC)
Applause	2841 Hennepin Ave	Minneapolis	Hennepin	Voluntary Investigation & Cleanup (VIC)
Urban Ventures II (Merc)	2900 & 2916 4th Ave S	Minneapolis	Hennepin	Voluntary Investigation & Cleanup (VIC)
Franklin Steele Commons Project	See location description	Minneapolis	Hennepin	Voluntary Investigation & Cleanup (VIC)
Gas Holder #4 (U of M Underground Library OU1)	See location description	Minneapolis	Hennepin	Voluntary Investigation & Cleanup (VIC)
Minnehaha Mall #2 (Target)	2500 E Lake St	Minneapolis	Hennepin	Voluntary Investigation & Cleanup (VIC)
29th Street Corridor Tunnel	See Location Description	Minneapolis	Hennepin	Voluntary Investigation & Cleanup (VIC)
HCRR ROW	See Location Description	Minneapolis	Hennepin	Voluntary Investigation & Cleanup (VIC)
Greenway Terrace Development	2850 Cedar Ave S	Minneapolis	Hennepin	Voluntary Investigation & Cleanup (VIC)
White Way Cleaners #3	113 26th St E	Minneapolis	Hennepin	Voluntary Investigation & Cleanup (VIC)
Artcraft Press	907-929 Portland Ave S	Minneapolis	Hennepin	Voluntary Investigation & Cleanup (VIC)
Le Parisien - Lyndale	2301 Lyndale Ave S	Minneapolis	Hennepin	Voluntary Investigation & Cleanup (VIC)
Anishinabe Bii-Gii-Wiin	Franklin Ave & Hiawatha Ave	Minneapolis	Hennepin	Voluntary Investigation & Cleanup (VIC)
Parcel F	See location description	Minneapolis	Hennepin	Voluntary Investigation & Cleanup (VIC)
Lumen Building	See Location Description	Minneapolis	Hennepin	Voluntary Investigation & Cleanup (VIC)
Hopf and Hopf Printing	2711 East Franklin Avenue	Minneapolis	Hennepin	Voluntary Investigation & Cleanup (VIC)
Brekke Properties	See location description	Minneapolis	Hennepin	Voluntary Investigation & Cleanup (VIC)
MNDOT I35W Bridge	See location description	Minneapolis	Hennepin	Voluntary Investigation & Cleanup (VIC)
MNDOT I35W Bridge - Norton Building	See location description	Minneapolis	Hennepin	Voluntary Investigation & Cleanup (VIC)
MNDOT I35W Bridge - Center Point Energy	See location description	Minneapolis	Hennepin	Voluntary Investigation & Cleanup (VIC)
MNDOT I35W Bridge - Minneapolis Park Board	See location description	Minneapolis	Hennepin	Voluntary Investigation & Cleanup (VIC)
MNDOT I35W Bridge - Metal-Matic Inc.	See location description	Minneapolis	Hennepin	Voluntary Investigation & Cleanup (VIC)
MNDOT I35W Bridge - U-CW Partnership LLP	See location description	Minneapolis	Hennepin	Voluntary Investigation & Cleanup (VIC)
MNDOT I35W Bridge - City of Minneapolis	See location description	Minneapolis	Hennepin	Voluntary Investigation & Cleanup (VIC)
Rail Support Facility	See location description	Minneapolis	Hennepin	Voluntary Investigation & Cleanup (VIC)
U of M - Spill Properties	See location description	Minneapolis	Hennepin	Voluntary Investigation & Cleanup (VIC)
Calhoun Square	3001 Hennepin Ave S	Minneapolis	Hennepin	Voluntary Investigation & Cleanup (VIC)
CCLRT - U of M Campus (Sec. 2)	See location description	Minneapolis	Hennepin	Voluntary Investigation & Cleanup (VIC)
Lyndale Avenue Gas Station	2752 Lyndale Ave S	Minneapolis	Hennepin	Voluntary Investigation & Cleanup (VIC)
National Vitamin	See location description	Minneapolis	Hennepin	Voluntary Investigation & Cleanup (VIC)
Eleventh Avenue Addition	See location description	Minneapolis	Hennepin	Voluntary Investigation & Cleanup (VIC)
Eleventh Avenue Addition #3	1101 W River Parkway	Minneapolis	Hennepin	Voluntary Investigation & Cleanup (VIC)
2605 2nd Avenue South	2605 2nd Ave S	Minneapolis	Hennepin	Voluntary Investigation & Cleanup (VIC)
1316 East 24th Street	1316 E 24th St	Minneapolis	Hennepin	Voluntary Investigation & Cleanup (VIC)
CCLRT - Civil West (Sec. 13 4)	See location description	Minneapolis	Hennepin	Voluntary Investigation & Cleanup (VIC)



TABLE D8 - WIMN - NO CLOSED OR COMPLETED VIC SITES

Site Name	Address	City	Activity
312 Partnership LLC Property	312 S 3rd St	Minneapolis	Leak Site
Janesville Auto Transport Co	2700 26th Ave S	Minneapolis	Multiple Activities
Photos Inc	2601 Minnehaha Ave S	Minneapolis	Voluntary Investigation & Cleanup (VIC)
Gas Holder #4 (U of M Underground Library OU1)	See location description	Minneapolis	Voluntary Investigation & Cleanup (VIC)
29th Street Corridor Tunnel	See Location Description	Minneapolis	Voluntary Investigation & Cleanup (VIC)
White Way Cleaners #3	113 26th St E	Minneapolis	Voluntary Investigation & Cleanup (VIC)
Parcel F	See location description	Minneapolis	Voluntary Investigation & Cleanup (VIC)
MNDOT I35W Bridge	See location description	Minneapolis	Voluntary Investigation & Cleanup (VIC)
MNDOT I35W Bridge - Norton Building	See location description	Minneapolis	Voluntary Investigation & Cleanup (VIC)
MNDOT I35W Bridge - Center Point Energy	See location description	Minneapolis	Voluntary Investigation & Cleanup (VIC)
MNDOT I35W Bridge - Minneapolis Park Board	See location description	Minneapolis	Voluntary Investigation & Cleanup (VIC)
MNDOT I35W Bridge - Metal-Matic Inc.	See location description	Minneapolis	Voluntary Investigation & Cleanup (VIC)
MNDOT I35W Bridge - U-CW Partnership LLP	See location description	Minneapolis	Voluntary Investigation & Cleanup (VIC)
MNDOT I35W Bridge - City of Minneapolis	See location description	Minneapolis	Voluntary Investigation & Cleanup (VIC)
Rail Support Facility	See location description	Minneapolis	Voluntary Investigation & Cleanup (VIC)
U of M - Spill Properties	See location description	Minneapolis	Voluntary Investigation & Cleanup (VIC)
Calhoun Square	3001 Hennepin Ave S	Minneapolis	Voluntary Investigation & Cleanup (VIC)
CCLRT - U of M Campus (Sec. 2)	See location description	Minneapolis	Voluntary Investigation & Cleanup (VIC)
Lyndale Avenue Gas Station	2752 Lyndale Ave S	Minneapolis	Voluntary Investigation & Cleanup (VIC)
2605 2nd Avenue South	2605 2nd Ave S	Minneapolis	Voluntary Investigation & Cleanup (VIC)
1316 East 24th Street	1316 E 24th St	Minneapolis	Voluntary Investigation & Cleanup (VIC)
Pillsbury "A" Mill Complex	335 Main St SE	Minneapolis	Multiple Activities
CCLRT - Civil West (Sec. 13 4)	See location description	Minneapolis	
U of M Bike Trail	BNSF Property	Minneapolis	Multiple Activities
Buzza Historic Lofts	1006 W Lake St	Minneapolis	Multiple Activities
Theisen Vending Co - Mpls	3800 Nicollet Ave	Minneapolis	Multiple Activities
MINNEGASCO OU-2 Groundwater	1406 West River Pkwy	Minneapolis	Superfund Project
Proposed Lunds on Hennepin	1201 1207 and 1213 Hennepin Ave	Minneapolis	Petroleum Brownfield
Bennett East Parcel	2821 thru 2825 Dupont Av S	Minneapolis	Petroleum Brownfield
Lasky Properties	1500 to 1544 Nicollet Ave S	Minneapolis	Petroleum Brownfield
Hennepin Healthcare System Inc	SW of W28th St and Nicollet Ave S	Minneapolis	Petroleum Brownfield
Calhoun Square	3001 Hennepin Ave S	Minneapolis	Petroleum Brownfield
Uptown Rainbow Foods and Arbys	1104 Lagoon Ave and 1116 Lake St W	Minneapolis	Petroleum Brownfield
1100 South 2nd Street Property	1100 S 2nd St	Minneapolis	Multiple Activities
Xcel Energy - Chestnut Service Center	1518 Chestnut Ave	Minneapolis	Multiple Activities
Bystrom Bros Inc	2200 Snelling Ave	Minneapolis	Multiple Activities
American Swedish Institute	2600 Park Ave S	Minneapolis	Multiple Activities
Hennepin County Medical Center	701 Park Ave S	Minneapolis	Multiple Activities
Leder Brothers Co	3240 Snelling Ave	Minneapolis	Multiple Activities
Tubs Inc	705 5th St N	Minneapolis	Multiple Activities
Roof Depot	1860 E 28th St	Minneapolis	Multiple Activities
Fairview Riverside Hospital Expansion	Riverside Ave and 24th Ave S	Minneapolis	Multiple Activities

TABLE D9 - REMAINING SITES OF INTEREST

Site Name	REPORT ID	Address	lat	long	City	County	Activity	ID
1100 South 2nd Street Property	1	1100 S 2nd St	44.97643	-93.25224	Minneapolis	Hennepin	Multiple Activities	
1316 East 24th Street	2	1316 E 24th St	44.95918	-93.25596	Minneapolis	Hennepin	Voluntary Investigation & Cleanup (VIC)	VP26760
2605 2nd Avenue South	3	2605 2nd Ave S	44.95541	-93.27399	Minneapolis	Hennepin	Voluntary Investigation & Cleanup (VIC)	VP26730
29th Street Corridor Tunnel	4	See Location Description	44.95194	-93.2626	Minneapolis	Hennepin	Voluntary Investigation & Cleanup (VIC)	VP16060
312 Partnership LLC Property	5	312 S 3rd St	44.97895	-93.26464	Minneapolis	Hennepin	Leak Site	18408
American Swedish Institute	6	2600 Park Ave S	44.95547	-93.26524	Minneapolis	Hennepin	Multiple Activities	Multiple Activities
Bennett East Parcel	7	2821 thru 2825 Dupont Av S	44.95075	-93.29239	Minneapolis	Hennepin	Petroleum Brownfield	4005
Buza Historic Lofts	8	1006 W Lake St	44.94841	-93.29205	Minneapolis	Hennepin	Multiple Activities	Multiple Activities
Calhoun Square	9	3001 Hennepin Ave S	44.94821	-93.29757	Minneapolis	Hennepin	Voluntary Investigation & Cleanup (VIC)	VP25500
CCLRT - Civil West (Sec. 13 4)	10	See location description	44.97365	-93.23187	Minneapolis	Hennepin	Voluntary Investigation & Cleanup (VIC)	VP25530A
CCLRT - U of M Campus (Sec. 2)	11	See location description	44.97365	-93.23187	Minneapolis	Hennepin	Voluntary Investigation & Cleanup (VIC)	VP10371
Gas Holder #4 (U of M Underground Library OUI)	12	See location description	44.97267	-93.24315	Minneapolis	Hennepin	Multiple Activities	Multiple Activities
Janesville Auto Transport Co	13	2700 26th Ave S	44.95303	-93.23477	Minneapolis	Hennepin	Multiple Activities	Multiple Activities
Leder Brothers Co	14	3240 Snelling Ave	44.944	-93.23289	Minneapolis	Hennepin	Multiple Activities	Multiple Activities
MNDOT 135W Bridge	15	See location description	44.97741	-93.24561	Minneapolis	Hennepin	Voluntary Investigation & Cleanup (VIC)	VP23630
MNDOT 135W Bridge - Center Point Energy	16	See location description	44.97732	-93.24642	Minneapolis	Hennepin	Voluntary Investigation & Cleanup (VIC)	VP23630C
MNDOT 135W Bridge - City of Minneapolis	17	See location description	44.98026	-93.24405	Minneapolis	Hennepin	Voluntary Investigation & Cleanup (VIC)	VP23630L
MNDOT 135W Bridge - Metal-Matic Inc.	18	See location description	44.97856	-93.27177	Minneapolis	Hennepin	Voluntary Investigation & Cleanup (VIC)	VP23630G
MNDOT 135W Bridge - Minneapolis Park Board	19	See location description	44.97586	-93.27177	Minneapolis	Hennepin	Voluntary Investigation & Cleanup (VIC)	VP23630D
MNDOT 135W Bridge - Norton Building	20	See location description	44.97327	-93.2458	Minneapolis	Hennepin	Voluntary Investigation & Cleanup (VIC)	VP23630A
MNDOT 135W Bridge - U-CW Partnership LLP	21	See location description	44.97586	-93.27177	Minneapolis	Hennepin	Voluntary Investigation & Cleanup (VIC)	VP23630I
Parcel F	22	See location description	44.97744	-93.25661	Minneapolis	Hennepin	Voluntary Investigation & Cleanup (VIC)	VP21870
Pillsbury "A" Mill Complex	23	335 Main St SE	44.98355	-93.25298	Minneapolis	Hennepin	Multiple Activities	Multiple Activities
Proposed Lunds on Hennepin	24	1201 1207 and 1213 Hennepin Ave	44.97024	-93.2861	Minneapolis	Hennepin	Petroleum Brownfield	3975
Rail Support Facility	25	See location description	44.95653	-93.24241	Minneapolis	Hennepin	Voluntary Investigation & Cleanup (VIC)	VP23940
Theisen Vending Co - Mpls	26	3800 Nicollet Ave	44.93405	-93.27799	Minneapolis	Hennepin	Multiple Activities	Multiple Activities
Tubs Inc	27	705 5th St N	44.97497	-93.28355	Minneapolis	Hennepin	Multiple Activities	Multiple Activities
U of M - Spill Properties	28	See location description	44.96891	-93.22622	Minneapolis	Hennepin	Voluntary Investigation & Cleanup (VIC)	VP24450
U of M Bike Trail	29	BNSF Property	44.97565	-93.23335	Minneapolis	Hennepin	Multiple Activities	Multiple Activities
Uptown Rainbow Foods and Arbys	30	1104 Lagoon Ave and 1116 Lake St W	44.94535	-93.29236	Minneapolis	Hennepin	Petroleum Brownfield	3885

Abbott Northwestern Hospital  
Permit No. 05300061-002  
Technical Support Document

## **Attachment 9**

### **Facility Specific Risk Analysis and Cumulative Levels and Effects Summary**



1. AQ Facility ID No.: 05300061
2. AQ File No.: 253
3. Facility Name: Abbott Northwestern Hospital
4. Date of Initial Submittal (and major revisions): March 1, 2012
5. Date of Risk Manager Meeting: 9.24.12
6. Project Team Members: Sarah Sevcik, Kristie Ellickson, Greg Pratt, Shelley Burman, Steve Pak
7. Assigned Section Manager/s: Don Smith and Frank Kohlasch
8. Standard Industrial Classification (SIC): 8602

**9. Brief Summary:**

Facility and Project Description

- Abbott Northwestern Hospital (ANW) is owned by Allina Health Systems and includes the largest hospital in the Twin Cities, the associated laboratories and diagnostic centers. They serve approximately 200,000 patients each year.
- The hospital is applying for a permit amendment. They propose to remain a synthetic minor under PSD and Part 70 permit programs.

The current permit includes the operation of the following equipment:

- four boilers (Group 1) that combust natural gas or number 6 fuel oil,
- six generators (Group 2) that combust distillate fuel oil (diesel),
- four boilers (Group 3) that combust natural gas or distillate fuel oil, and
- four emergency generators (Group 4) that combust distillate fuel oil.

The hospital has applied for a permit amendment to allow these changes to their existing permit:

- change fuels for the four boilers in Group 1 to natural gas and distillate fuel oil
- change the six generators in Group 2 from peaking to emergency generators
- add nine natural gas boilers for the lab building, and
- add one emergency generator which combusts distillate fuel oil for the lab building

**10. Site Setting**

- The hospital is located in South Minneapolis in the area described by Minn Stat 116.07 Subd4a, therefore, consideration of a cumulative levels and effects analysis is required for air permitting.
- This is an urban area with residential, commercial and industrial zoning uses.
- Since there is no fence restricting public access to the facility, there is no ambient boundary around the facility. Public sidewalks surround the facility.
- The nearest resident is 40 meters from the hospital.

**11. Emissions**

- Emission calculations were based on PTE (potential to emit) and permit limited emissions. Actual annual emissions are much less than the PTE or permit limited emissions.
- PTE and permit limited emission estimates used AP-42 emission factors for natural gas and number 2 fuel oil.
- Hexavalent chromium was speciated according to EPA guidance for natural gas and number 2 fuel oil.



- An 80% Nitrogen dioxide/total nitrogen oxides ratio was assumed. This follows EPA's Tier 2 guidance.
- The emissions estimate for the added emergency generator at the lab (EU-27) was based on manufacturer's data. This is becoming more common for this type of unit due to new federal requirements.
- Emergency generators were not included in the AERA modeling, but were included in the NAAQS modeling. More discussion is included below.

## **12. Dispersion Modeling**

- i. The latest version of AERMOD was used for air toxics dispersion modeling.
- ii. Q/CHI sums were modeled, resulting in time and space pairing/matching of calculated risk estimates. Therefore, multiple maximum air concentrations are not being summed from various locations around the facility, as sometimes occurs in more screening level air dispersion modeling exercises.

## **13. Facility Risks**

In human health risk assessment, we need to consider reasonable yet maximal ways in which humans may be exposed to pollutants. These reasonable, yet maximal, ways people are exposed are called, "exposure scenarios". Potential human health effects from the potential and permitted air emissions from the ANW hospital were assessed for the following exposure scenarios: inhalation, indirect soil ingestion, ingestion of homegrown produce, and ingestion of homegrown eggs.

- i. This risk estimation modeling effort was conducted as a screening exercise for the scoping of the Cumulative Levels and Effects report.
- ii. None of the risk estimates for long-term exposures (lifetime, chronic) were above facility risk guidelines or CL&E screening levels (i.e. risk driver levels).
- iii. The only exposure pathway and duration above screening levels for this project was acute inhalation. The majority of the acute hazard index was from potential hourly nitrogen dioxide emissions. Nitrogen dioxide is associated with short-term respiratory effects such as asthma exacerbation.

## **14. Cumulative Risks**

- i. A Cumulative Levels and Effects analysis was conducted for Abbott Northwestern Hospital.
- ii. The two health endpoints that screened in for further investigation were respiratory effects from modeled NO<sub>2</sub> concentrations and cardiovascular events from modeled PM<sub>2.5</sub> concentrations.
- iii. The following environmental health data were included in the CL&E analysis: traffic densities, NATA and MNRiskS modeled risk estimates, Air Quality Alert data as calculated from measured PM<sub>2.5</sub> data, a What's In My Neighborhood analysis, potential for idling vehicles, ambient monitoring data (carbonyls, vocs, metals and nitrogen dioxide and PM<sub>2.5</sub>), asthma hospitalizations, cardiovascular (IHD) hospitalizations, basic health outcomes and risk factor information from socioeconomic status and tobacco use.
- iv. When summed together the acute respiratory risk estimates from ambient monitoring data and facility risk estimates equals 1, the risk guideline used for facility-specific risk estimates (i.e. not cumulative), but does not exceed it.



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## **15. Additional Considerations**

### **Emergency generators**

Some of the generators at ANW Hospital are currently enrolled in a peaking program with the electric utility. This means that in the case of a large energy need, the power from these generators could be incorporated into the wider electrical grid. As far as air emissions, this means that, under a peaking program, these generators are more likely to be activated and operating than generators that are strictly for emergency use by the facility. If there is a potential for this to happen, then the modeling must reflect use of the generators for extended periods of time, rather than the use for emergency and maintenance purposes. For this reason, the permit application proposes the release of the generators from the peaking program. Emergency generators are eliminated from quantitative evaluation in AERA's, but they are included in the criteria pollutant analysis (pollutants with federal and state standards). The permit application materials include limits on the testing of these generators, to be completed in succession and not in tandem (i.e. not activated all at once). The modeling for the criteria pollutant analysis reflected this proposed permit limit.

### **Quantitative Results**

## **16. What is the source of the following summaries?**

X:\Old\_P\_Fo\AQPRJ\TOXTEAM\Airstream\Projects\Abbott Northwestern Hospital\External  
Submittals\Previous Submittals\[2012043]\_Abbott Permit Submittal\REPORTS



**AERA INTERNAL FORM-02**  
**FACILITY-SPECIFIC RISK ANALYSIS AND**  
**CUMULATIVE LEVELS AND EFFECTS SUMMARY**

a. After Permit Amendment

Air Toxics Screen									
Total Inhalation Screening Hazard Indices and Cancer Risks				Total Indirect Pathway Screening Hazard Indices and Cancer Risks			Total Multipathway Screening Hazard Indices and Cancer Risks		
Acute [1]	Subchronic Noncancer [1]	Chronic Noncancer [1]	Cancer [2]	Urban Gardener Noncancer [1]	Urban Gardener Cancer [2]	Resident Noncancer [1]	Resident Cancer [2]	Urban Gardener Noncancer [1]	Urban Gardener Cancer [2]
0.6	0.001	0.02	6e-7	0.02	4e-7	0.002	1e-7	0.02	9.6e-7

Note: The hazard index (HI) against which facility risks are compared for acute, sub-chronic and chronic non-cancer risks is 1. The cancer risk against which facility risks are compared is 1 E-5 (or 1 chance in 100,000). These facility risk guidelines are risk management-based. They are not discrete indicators of observed adverse effect. If a risk estimate falls below facility risk guidelines, the MPCA may conclude, without further analysis, that the assessed health effects from the proposed action are unlikely to occur, or will be negligible. A risk estimate that exceeds a guideline triggers further careful consideration.

17. Mass and Percent Mass Assessed in each RASS Analysis Not applicable

Scenario Description	Mass HAPS (tons per year)	% HAPS	Optional	
			Mass VOC (tons per year)	% VOC



**18. For each exposure pathway below, list the risk drivers and their percent contribution to the hazard indices or cancer risks.**

**a. Inhalation Exposure Pathway**

Chemical	HQ/cancer risk	% contribution	Exposure Duration	Comments (endpoints)
Nitrogen Dioxide	<0.6	>95%	Acute	respiratory

**b. Indirect Exposure Pathway (None)**

Chemical	HQ/cancer risk	% contribution	Exposure	Comments
No Risk Drivers				

**c. Total Risks**

Chemical	HQ/cancer risk	% contribution	Exposure	Comments
Nitrogen Dioxide	<0.6	>95%	Acute	No other risk drivers

**d. Were surrogate inhalation health benchmarks used for risk drivers? Which ones and what further analysis might better inform the risks?**

Nitrogen dioxide was the only risk driver pollutant in this analysis. An 80% nitrogen dioxide/nitrogen oxides ratio was assumed. The health benchmark was specific to nitrogen dioxide, not total nitrogen oxides.

**19. Are the criteria pollutants compared to the AAQS using "high first high" modeled concentrations (rather than the regulatory standard)? If not, what was used?**

A full criteria pollutant modeling effort (NAAQS) was conducted as a part of the scoping effort for the Cumulative Levels and Effects analysis. Criteria pollutant design values were compared to CL&E screening levels (significant impact levels) and used to scope the Study Area. The results are presented in the table below. This means that the method in which air pollutants with federal and state standards were assessed is approved by EPA, and considered human health protective.





TABLE 3.4A - MODELED CONCENTRATIONS				
Pollutant	Averaging Time	Maximum concentration including background ( $\mu\text{g}/\text{m}^3$ )	NAAQS ( $\mu\text{g}/\text{m}^3$ )	MAAQS ( $\mu\text{g}/\text{m}^3$ )
NO <sub>2</sub>	Annual	48.8	100	100
NO <sub>2</sub>	1-hr (design value)	178.7 (A)	188	N/A
PM10	Annual	<SIL	50	50
PM10	24-hr H1H	<SIL	150	150
PM2.5	Annual	13.0	15	15
PM2.5	24-hr (design value)	34.0	35	65
CO	8-hr H1H	<SIL	10,000	10,000
CO	1-hr H1H	<SIL	40,000	35,000
SO <sub>2</sub>	Annual	<SIL	80	60
SO <sub>2</sub>	24-hr H1H	<SIL	365	365
SO <sub>2</sub>	3-hr H1H	<SIL	1300	915
SO <sub>2</sub>	1-hr H1H	<SIL	196	1300
(A) The model shows a maximum concentration of 442 $\mu\text{g}/\text{m}^3$ ; however the maximum concentration near the Facility is 178.7 $\mu\text{g}/\text{m}^3$ along the east side of the Lab building. Background facilities are responsible for the maximum concentration. See modeling report for details.				
Annual concentrations represent 5 year average concentrations.				
H1H = Highest first high. Design value = form of standard established by EPA.				
24-hr PM2.5 represents the 5-yr average of the 98th percentile of daily impacts				
<SIL indicates that the maximum modeled concentration from the Hospital is less than that respective significant impact level, which means that the Hospital will not significantly contribute for that pollutant and averaging time and therefore refined modeling is not required.				
NAAQS = National Ambient Air Quality Standard				
MAAQS = Minnesota Ambient Air Quality Standard				

#### Summary from HG-01 Form and MMREM

#### 20. Mercury Analysis:

Mercury emission estimates were below the level that typically triggers further analysis (less than 1 pound per year).



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### **Qualitative Evaluation**

#### **Exposure Setting**

##### **21. Describe multimedia issues that may be relevant to this facility.**

There are no significant multimedia issues from this facility. All potential PBTs are emitted at levels lower than would trigger further investigation. The most extensive exposure scenario assessed included inhalation, incidental soil ingestion, homegrown produce ingestion, and homegrown egg production (the urban gardener).

##### **22. Describe current or future exposure based on zoning and land use information.**

This area is densely populated. The study area around Abbott Northwestern Hospital is zoned commercial, industrial and residential.

##### **23. Describe the types of sensitive receptors within 1.5 kilometers from the facility. (see map copied)**

This analysis was completed for a hospital, and therefore sensitive receptors were considered in all areas that modeling was performed.

##### **24. Summarize evidence that land in the Study Area will or will not be used for agriculture. Describe agricultural setting.**

This is an urban area, and although there is home-grown produce and egg production, other livestock husbandry is not currently occurring and is very unlikely to occur in the future.

##### **25. If PBTs are emitted, list and describe fishable water bodies within appropriate radius from facility/property boundary.**

PBTs are not emitted at a level triggering further investigation. None screened in as risk drivers.

#### **Cumulative Analysis and Potential Environmental Justice Areas**

##### **26. Is the facility located in an area described by Minn. Stat. §116.07, Subd4a?**

Yes.

##### **27. Is the facility located in an area that has a census tract averaged population that is more than 2 times the statewide average below poverty percentage, or over 2 times the statewide average percentage of non-white population?**

Abbott is located in an area that meets EPA's environmental justice criteria. The MPCA is incorporating elements of the EPA's guidelines for environmental justice by following the Cumulative Levels and Effects Process which requires the MPCA 1) to analyze and consider cumulative levels and effects of past and present pollution prior to issuing a permit, and 2) to conduct expanded community outreach such as



holding information sessions, providing email updates on permit processing, extended public comment period, etc.

**28. What other permitted facilities that have air emissions are located within a 1.5 kilometer radius of the facility?**

Abbott Northwestern Hospital completed a Cumulative Levels and Effects analysis. The CL&E process requires a summary of all "What's in my Neighborhood" sites within the Study Area that have the potential for exposures not described in other CL&E data. Each site not eliminated from further study is included in a Table in the CL&E report and is described qualitatively (on page 19 of the CL&E report).

A What's In My Neighborhood query for the Abbott NW Study Area resulted in approximately 1000 sites. This is similar to any area within the Twin Cities. These sites were screened for their potential for additional exposures beyond that already described in CL&E data based on the pathway of potential exposure, their inclusion in the MNRiskS results, regulatory control and oversight, or the potential for contribution to the health endpoints scoped in for further study (e.g. respiratory and cardiovascular effects). The types of sites eliminated from further qualitative characterization were: inactive sites, small to minimum hazardous waste sites, air permits, construction stormwater projects, tanks, leak sites, and VIC sites past end date or completed.

After screening out the sites described in the paragraph above, a list of "Sites of Interest" is prepared, and discussed qualitatively. Thirty sites were added to this list and required further investigation as to their potential to contribute to existing exposures. The site descriptions included in the full CL&E report are copied and pasted below.

**Report ID #2 : "1316 East 24<sup>th</sup> Street" located 0.5 miles from the Facility**

This property is owned by the American Indian Community Development Corporation and Indian Health Board and includes a residential structure, a garage, and a shed and is in the VIC program (VP26760). A Phase I and Phase II assessment and soil borings have been conducted, and analytical testing has been completed for lead, arsenic, gasoline range organics (GRO), and diesel range organics (DRO). Typically, contaminated soil does not emit significant air pollution unless the soil is disturbed or is exposed to wind erosion.

**Report ID #4: "29<sup>th</sup> Street Corridor Tunnel" located 0.3 miles from the Facility**

This site is a tunnel under the existing Sears building that is in the VIC program (VP16060). The MPCA requested that the top 3 inches of soil be removed prior to construction of the tunnel due to potential asbestos contamination. Exposure from the soil is only likely if the soil becomes airborne and is inhaled. Typically contractors removing contaminated soil take precautions to avoid significant human health risk due to inhalation during transport.

**Report ID #6: "American Swedish Institute" location 0.2 miles from the Facility**



This is a petroleum brownfield site (3876). There are leak sites on this property that were closed in 2005. -Phase I and Phase II assessments were conducted in 2009 and 2010 which showed the presence of DRO in the soil. A site response action plan/construction contingency has been prepared, approved by the MPCA and was carried out in 2011. A development response action plan was submitted to the MPCA in 2011 and the MPCA is still reviewing it.

**Report ID #7: "Bennett East Parcel" located 1.6 miles from the Facility**

This property is in the tanks and leaks program (4005). It is the former Bennett Lumber company site, which has seen numerous uses throughout the years including a fence company, creamery packaging company, sash and door company, lumber company, rubber and laundry equipment company, glass and woodworks company. Redevelopment is planned for apartment buildings. The soil contains detectable amounts of BaP (benzo-a-pyrene) and DRO.

**Report ID #12: "Gas Holder #4 (U of M Underground Library OU1)" located 1.6 miles from the Facility**

This site is in the VIC program (VP10731). No further data is readily available through the WIMN database.

**Report ID #15 & 16: "MNDOT I35W Bridge" and "MNDOT I35W Bridge – Center Point Energy" located 1.8 miles from the Facility**

These sites are in the VIC program (VP20630 and VP23630C). No further data is readily available through the WIMN database.

**Report ID #30: "Uptown Rainbow Foods and Arbys" located 1.6 miles from the Facility**

This is a petroleum brownfield site (3885). Historical land uses have included dry cleaning, a battery manufacturer, chemical manufacturing, railroad, gas station, and possibly underground storage tanks. There is documented history of chlorinated groundwater. The current occupant proposes to redevelop the current store. An MPCA approved development response action plan exists and is directed toward tetrachlorethylene and DRO soil contamination. The current occupant is in the design phase.

**29. Describe general statewide monitoring data and how it relates to the chemicals emitted at this facility.**

The monitoring data reported below were measured at the HC Andersen School ambient monitor station and the highest measurement of nitrogen dioxide in the state (typically measured at the Blaine ambient monitoring site).



	Max Acute Respiratory Hazard Index	Max Chronic Respiratory Non-Cancer Hazard Index	Max Cancer Risk
Estimated Risks from Monitoring Data	0.3	1.1	5E-05
Total modeled facility risks at site of maximum impact	0.6	0.02	9.6e-7
Total Cumulative Sum at site of maximum impact	1	1	5E-05

Cumulative sums are only reported to one significant figure. This is appropriate for the level of uncertainty in the calculation and estimation.

#### ADDITIONAL INFORMATION

##### **30. Missing chemicals or sources:**

- a. Are there any potentially missing sources from the emission list not included in the RASS or Q/CHI workbook?

None of which I am aware.

- b. Is there information suggesting additional chemicals are emitted (e.g., based on experience at similar facilities)?

None of which I am aware.

##### **31. List chemicals emitted but lacking inhalation health benchmarks.**

Acenaphthene, anthracene, barium, fluoranthene, fluorene, 2-methyl naphthalene, phenanthrene, pyrene and zinc.

##### **32. List known respiratory sensitizers emitted.**

Beryllium and nickel

##### **33. List developmental toxicants emitted.**

Arsenic, benzene, ethyl benzene and mercury. The maximum modeled air concentrations were not above ceiling levels or above risk driver levels.

##### **34. Where is the maximum modeled concentration (risk) for Chronic?**





Neither the chronic non-cancer nor the cancer modeled risk estimates were above risk driver levels. However, the risk estimates tended to concentrate according to prevailing wind direction (i.e. were slightly higher to the east of the facility).

**35. Accidental Release information (Incident Management System data on facility reports of SSM events from the last 5 years). Additional information as relevant.**

There have been no complaints in the complaint tracker related to Abbott Northwestern Hospital.

**36. Internal Combustion Engines. (AERA-04 Certification for Emergency Internal Combustion Engines)**

The 11 emergency generators at Abbott Northwestern Hospital are described in the table below.

Section 7.

Stack Vent No.	ANW_SV02	ANW_SV03	ANW_SV04	ANW_SV05	ANW_SV06	ANW_SV07	ANW_SV09	ANW_SV10	ANW_SV11	ANW_SV12	ANW_SV21
Rated Heat Input (mmBtu/hr)	4.6	4.6	5.1	5.1	6.8	2.4	6.2	6.2	6.2	2.1	19.3
Rated mechanical Output (HP and RPM)	685	685	685	685	890	355	1,135	1,135	1,135	382	2,937
	1,800	1,800	1,800	1,800	1,800	1,800	1,800	1,800	1,800	1,800	1,800
Fuel Type (include sulfur %)	Diesel 0.0015%	Diesel 0.0015%	Diesel 0.0015%	Diesel 0.0015%	Diesel 0.0015%	Diesel 0.0015%	Diesel 0.0015%	Diesel 0.0015%	Diesel 0.0015%	Diesel 0.0015%	Diesel 0.0015%
Fuel consumption rate (gal/hr)	33	33	37	37	49	17	45	45	45	15	138
Stack Height (m)	6.1	6.1	6.1	9.1	10.7	6.1	11.0	11.0	11.0	9.1	9.1
Engine Location (UTM NAD83)	479346,	479348,	479358,	479321,	479325,	479343,	479453,	479453,	479454,	479392,	479392,
	4977967	4977967	4977967	4977966	4977975	4977755	4977933	4977934	4977935	4977625	4977626
Testing frequency and duration	(A)	(A)	(A)	(A)	(A)	(A)	(A)	(A)	(A)	(A)	(A)

Section 8.

Stack Inside Diameter (m)	0.20	0.20	0.20	0.20	0.20	0.12	0.27	0.27	0.27	0.15	0.29
Stack Velocity (m/s)	52.4	52.4	52.8	52.8	56.1	118.8	56.3	0.6	0.6	7.4	98.9
Stack Temperature (K)	786	786	764	764	783	800	752	752	752	807	673
Urban or Rural	Urban	Urban	Urban	Urban	Urban	Urban	Urban	Urban	Urban	Urban	Urban
Nearest Receptor Distance (m)	50	51	61	25	30	45	28	28	28	14	14

(A) Maintenance and readiness testing is typically conducted once per month for no more than 1 hour.

**37. Describe known community concerns as they relate to health risks associated with this facility.**

Community members, leaders and legislators have shown great concern for their environmental health and the community's environmental health in general. The statute is in place because of legislative support and community concern. It is unknown as to the concern about this hospital's air emissions. The location of the ambient monitor at the HC Andersen School has been questioned by community members and their representatives. It is the feeling of some in the community that the monitor is not placed in a hot spot and should be moved to better reflect perceived higher levels of pollution.

**38. Is there the possibility that emissions from diesel trucks idling on the facility property maybe equivalent or greater than 2 or more trucks idling continuously for an hour or longer on the facility property? Describe idling truck patterns. Is an idling truck prevention plan recommended?**



This hospital is not exempt from the non-idling ordinance in Minneapolis. However, if temperatures drop below a certain level delivery trucks may idle near the facility.

**39. Should a risk recalculation requirement be included in the permit?**

No. All modeling was completed using the assumption of maximum capacity with worst case fuels. A fuel change or other modification would likely need a permit amendment. In this area of Minneapolis they would be required to recalculate due to the statute.

**40. Additional Considerations:**

Descriptions of Vulnerabilities:

Specific Description	General Discussion
Asthma hospitalizations/emergency room visits	~less than to 1.3 times higher than Minneapolis average ~2 to 4 times higher than statewide average
Cardiovascular and Stroke hospitalizations	~less than to 1.2 times higher than Minneapolis average ~less than to 1.3 times higher than statewide average
Socioeconomic status	Potential Area of Environmental Justice Concern
% of Population without health insurance	One of the higher in Hennepin County
Ranking in AAFA 100 Cities Asthma	2011: Minneapolis ranked 89 <sup>th</sup> of 100 cities in the nation for the worst places to live with asthma** (1 <sup>st</sup> is the "worst city to live in with asthma of those ranked")
General overall health risk factors	Lower fruit and vegetable consumption and leisure time activity levels (i.e. exercise) than other less densely populated areas of Hennepin County

Description of Stressors

Specific Description	General Discussion
Ambient Air Toxics measurements	Similar to urban areas in St. Paul/ Minneapolis. Acute



<b>Ambient PM<sub>2.5</sub> measurements</b>	respiratory hazard indices range: 0.05 – 0.7. Similar to urban areas in St. Paul/Minneapolis, generally higher than less densely populated areas of the state
<b>Light Vehicle Traffic densities (census tract)</b>	Similar – 10X statewide averages (depending on distance from major roadways)
<b>Heavy Duty Vehicle Traffic densities (census tract)</b>	Similar – 20X statewide averages (depending on distance from major roadways)
<b>Exposure to tobacco smoke</b>	Tied for highest smoking rates in Hennepin County
<b>Consideration of potential exposures from nearby facilities</b>	Evaluated 30 nearby facilities for potential exposures, 7 were under some type of regulatory oversight but could not be eliminated as to their potential to contribute to existing exposures.
<b>Facility specific air emission risk analysis</b>	All risk estimates were below facility risk guidelines, acute hazard index was above the CL&E analyses screening level.
<b>Acute Respiratory Hazard Index (facility modeled + ambient monitoring data)</b>	1, similar to other urban area results
<b>Air Quality Index Days (as calculated by PM<sub>2.5</sub> data)</b>	The Twin Cities generally has a greater number of air quality alert days than other areas of the state.
<b>Minneapolis Idling Ordinance</b>	The hospital is not exempt from the Minneapolis Idling ordinance, however if temperatures drop below a certain level there may be truck-idling near the hospital.
<b>National and Statewide Modeled Risk Estimates (MNRiskS and NATA)</b>	Equal to 5X higher compared to statewide average Equal to 3X higher compared to Hennepin County average

**41. These topics (from Additional Information section) weren't considered applicable or noteworthy for this facility:**

Further investigations of PBT emissions were not warranted. The full "farmer" scenario was not relevant to the exposures in this area. There were no other exposures or pollutants other than those that screened in for further study (e.g. drinking water is not further discussed, carcinogens are not investigated further, etc.).

Noise was not discussed in the CL&E Report. This was due to complexity, lower impact from airport (one of the main sources of noise maps in the Twin Cities Metro Area), and because potential noise from traffic is indirectly presented using the traffic density maps in the CL&E. Exposures to elevated noise is a non-chemical stressor that is associated with elevated blood pressure and therefore, albeit indirectly, cardiovascular events. There are noise maps available from the Minneapolis/St. Paul airport, but these





do now show that the Statute Area is in the Noise Mitigation Area of the St. Paul/Minneapolis Airport. Highway traffic is also a source of noise, but this impact dissipates with distance from the source. MNDOT has requirements to place sound walls along highway corridors dependent on traffic density and distance from residence. There are sound walls along I-35W to the west of Abbott Northwestern hospital. There is further discussion on this in the Reference Document for CL&E analyses.

MPCA has written guidance on accounting for early life exposure to carcinogens, as informed by the MDH, the Cal EPA and the USEPA. Exposure to carcinogens in early life (i.e. between birth and weaning) sometimes, but not always, increases their potency. MDH recommends (<http://www.health.state.mn.us/divs/eh/risk/guidance/adafrecmd.pdf>) multiplying cancer risk results by 1.6 in their guidance. This screening assessment is used to inform qualitatively the potential additional risks from early life exposure to carcinogens. The urban gardener cancer risk was  $1E-6$ , which would result in a screening cancer risk with early life stage adjustment of  $1.6E-6$  (rounds to  $2E-6$ , or 2 additional cases of cancer in a population of 1,000,000). This adjustment is qualitative in nature, as it is a screening exercise. This adjustment does not increase the cancer risks above the facility risk guideline of 1 additional case of cancer in a population of 100,000.

Further investigation of the risk results from the Abbott NW risk modeling efforts show that arsenic is the main pollutant in the inhalation cancer assessment. The health benchmark used for arsenic is a health reference value (HRV) from the MDH. Since the studies used to develop this health benchmark did incorporate early life exposures (MDH early life sensitivity advice July 2010), the multiplication by 1.6 of the entire final cancer risk value is not appropriate. Therefore, cancer risk estimates (with early life exposure incorporated into the final value) from the Abbott NW hospital risk estimates are neither above the CL&E screening value nor the facility risk guideline.

#### Ethylene Oxide Sterilizer

The facility operates two ethylene oxide (EO) sterilizer units to prepare surgical instruments for use. EO emissions from the sterilizer units are controlled by an EO abator. MPCA staff conducted screening modeling to determine whether including the emissions of EO from the sterilizers would require further study as part of the CL&E. The total urban gardener cancer risk was assessed, as it is the most inclusive of the exposure scenarios (i.e. if the urban gardener screens out so do the inhalation pathway and the resident scenarios).

When the *uncontrolled* EO emissions were modeled, the urban gardener cancer risk estimate exceeded the CL&E screening level. Please note, that although the CL&E screening levels were exceeded, neither a health benchmark nor a risk guideline were exceeded. Next, the *controlled* EO emissions, were included in the air dispersion modeling. When summed with all other air emissions from the facility, the screening level for the total urban gardener cancer risk was not exceeded.

The use of control efficiencies in modeling is acceptable only if those controls are required in the facility air permit. The proposer from ANW hospital agreed to have these control units included in the air permit. The draft air emission permit for ANW will 1) include the sterilizers as emission units and 2) require the use of the control equipment. Therefore, the screening modeling of EO emissions at ANW hospital resulted in no further study for the CL&E. Without the additional analysis required in this area



of South Minneapolis, the sterilizer units would be considered insignificant activities under permitting rules.

#### Potential Arsenic Exposure and Cardiovascular Outcomes

Both short term and long term exposures to arsenic are associated with cardiovascular and respiratory health effects, as arsenic is a fairly systemic toxin. The South Minneapolis Residential Soil Contamination Site is located in the study area for this project. According to technical risk assessment documents for this site, an acute level of 110 ppm of arsenic in soil was identified. Residences with soil concentrations of arsenic at or exceeding this level were cleaned up to a background arsenic level from 2004 – 2007 (personal communication Leah Evison, Remedial Project Manager, EPA). The City of Minneapolis authored an ordinance requiring access to all residences to conduct arsenic remediation. The complete remediation of the South Minneapolis Residential Soil Contamination Site was completed for a chronic background level in September 2011, using funds from the American Recovery and Reinvestment Act. It is not expected that this site is a current source of arsenic for short or long-term levels of concern.

The MN Department of Health conducted an arsenic biomonitoring study in this area to test the concentrations of arsenic in children surrounding this Superfund Site. Children were studied because they tend to be a more highly exposed population due to increased exposure to soil overall. A total of 65 children agreed to participate in the study, and four of these children had urine arsenic levels above the ATSDR/CDC action level. The higher levels of arsenic in these children's urine did not correlate with the higher soil arsenic concentrations, and the speciation of this arsenic was of the type associated with dietary exposure. Arsenic, absorbed from the lungs or the gastrointestinal tract, is excreted in the urine within 1-2 days, and so biomarkers for arsenic reflect only recent exposures and not chronic body burden.

Residential drinking water in the Area of Study is supplied by the City of Minneapolis Water Works. There is an annual water quality report published by the City of Minneapolis that reports all detectable pollutants in the drinking water and compares them to applicable health standards. Arsenic was not detected, and therefore not reported, in any of the the City of Minneapolis municipal drinking water reports up to the year 2012 (City of Minneapolis drinking water quality report).

#### Uncertainty Analysis Summary

42. What potential impacts do emission estimates have on underestimating and/or overestimating risks in the analysis? How close are the emission estimates to what the facility will actually emit? What are the factors that impact this?



Emissions are overestimated in that they are based in part on AP-42 emission factors. The factors in AP-42 are based on older boilers and emergency generators. The new boilers (9=how many) are more efficient than is reflected in the emissions estimates.

Emissions estimates for nitrogen dioxide are overestimated, because they were developed for total NO<sub>x</sub>. The modeled nitrogen dioxide emissions were 80% of the estimated NO<sub>x</sub> emission rates. This is generally a protective or conservative assumption.

Some emission rates based on AP-42 factors are exempt from quantitative analysis, because the factors have very low quality ratings and were based on detection limits of the analysis tools. (i.e. concentrations of these pollutants were not detected). This may be an underestimation of emissions.

Boilers and emergency generators are not new types of emission sources. Therefore, they have been studied more and therefore may have less uncertainty in the emission estimates than other novel or newer air emission sources. This is neither an overestimation nor an underestimation.

The actual emissions are likely much lower than the potential and permit limited emissions. The company has discussed this in the CL&E Report.

Emission factors for PM, PM<sub>10</sub>, PM<sub>2.5</sub> and NO<sub>x</sub> for the added emergency generator (EU-27) were based on manufacturer's guarantees. The manufacturer guarantees are becoming more common for this type of unit due to new federal requirements. This may result in an overestimate or an underestimate.

Emissions from emergency generators are exempt from quantitative consideration in AERA modeling. This could result in an underestimate of modeled air concentrations (e.g. nitrogen dioxide) in the risk assessment. The list below is additional information related to the emergency generators.

- The permit application proposed a staggered testing protocol for emergency generators, which would only allow one emergency generator to be tested at a time.
- The emergency generators were signed up for a peaking program, this agreement has not been renewed. Within that peaking program, the emergency generators could all have been operated at any time.
- The emergency generators are required at the hospital by other health care based regulatory agencies.
- Emergency generators were included in the NAAQS modeling according to the proposer permit limited staggered testing protocol.

**43. What potential impacts does the dispersion modeling have on underestimating and/or overestimating risks in the analysis? How accurate is the dispersion model to the actual site dispersion? What are the factors impacting the accuracy?**

A refined air dispersion modeling analysis was completed using actual stack parameters, building dimensions, land use, topography, and 5 years of meteorological data. The model predictions reflect the state of the regulatory science. The AERMOD model was used, and the Q/Chi methodology was



employed. This method pairs risk estimates in time and space. So, this portion of the modeling methodology does not overestimate risk as much as more screening level methods.

Deposition was not specifically modeled; rather the multi-pathway screening factors were used to estimate ingestion risks as a result of pollutant deposition. These values were designed for screening purposes (Pratt and Dymond, 2009) and result generally in an overestimate of ingestion based risks. They do however, require a comparison with a pollutant with an inhalation benchmark. So, in this way pollutants without inhalation health benchmarks are underestimated.

Dry and wet depletion were not selected as an option. This may result in an overestimate of air concentrations for particulate emissions.

**44. What potential impacts do the toxicity values have on underestimating and/or overestimating risks in the analysis?**

The MPCA recommends toxicity values based on an agreement with MDH. The recommended hierarchy for toxicity values is: MDH guidance > MDH HRVs > EPA IRIS values > Cal EPA values > PPRTVs.

The toxicity value that most influenced the results of the Abbott NW AERA modeling was for short-term nitrogen dioxide exposure. The health benchmark used to assess potential health effects from short-term exposure was an Acute Reference Level developed by California/EPA/OEHHA. The value was based on no observed effect level for a sensitive human population (asthmatics). This results in less uncertainty in this health benchmark compared to other health benchmarks (e.g. developed from animal studies, or based on a level at which an effect was seen (LOAEL). The specific health endpoint related to this comparison value (or health benchmark) is increased airway reactivity in asthmatics.

**45. What potential impacts do the exposure assumptions have on underestimating and/or overestimating risks in the analysis? What are the factors impacting the analysis?**

An air emissions risk assessment (AERA) was conducted as required by the CL&E Process. The exposure scenarios assessed in the AERA are described in the table below.

<b>Exposure Scenario</b>	<b>Exposure Pathways</b>	<b>Exposure Source (Media)</b>	<b>Exposure Durations</b>
Inhalation	Inhalation	Inhalation (air)	One hour (acute) Lifetime (chronic: non-cancer and cancer)
Resident	Inhalation+ Ingestion	Inhalation (air) + indirect soil ingestion + direct ingestion of homegrown produce	Lifetime (chronic: non-cancer and cancer)
Urban Gardener	Inhalation+ Ingestion	Inhalation (air) + indirect soil ingestion + direct ingestion of homegrown produce + ingestion of home-produced eggs (backyard chickens)	Lifetime (chronic: non-cancer and cancer)



Method of Intake	Indirect soil ingestion	Egg consumption	Homegrown produce	Inhalation
amount per week (~40 year exposure duration)	0.7 g/week	7 eggs/week	1.4 pounds/week	Average inhalation rate over a lifetime

The facility-specific chronic and cancer (for all exposure scenarios) risk estimates were below the screening levels indicated for a CL&E analysis.

The facility-specific acute risk estimate was above the CL&E screening level, and therefore this health endpoint required further investigation. The facility-specific acute risk estimate was summed together with ambient monitoring data to provide an aggregate hazard index (air based cumulative hazard index). The summed acute respiratory risk estimate equals 1, which is at the guideline for facility-specific risk estimates, but does not exceed it. The majority of the acute hazard index used in the risk estimate was due to potential hourly nitrogen dioxide emissions. Nitrogen dioxide is associated with short-term (acute) respiratory effects such as asthma exacerbation.

**46. What other factors could have an impact on underestimating and/or overestimating risks in the analysis?**

Temperature fluctuations (cold air exposure or sudden temperature changes) are not discussed, changes of temperature can be linked to asthmatic episodes. This is a complex topic. The sources of air emissions are mainly boilers, operating in the winter. Exposure to cold air is obviously more common in the winter, however conversion of NO<sub>x</sub> to nitrogen dioxide is associated with ozone and voc concentrations. Ozone concentrations are much lower in winter months, and therefore NO<sub>x</sub> tends to be lower. Pollen and pet dander are also known triggers of asthmatic episodes, these were not discussed due to limitations in data.

**47. MDH Coordination:**

The Minnesota Health Department was involved in the scoping of the CL&E methodology. Within project related work, MDH has had two roles: community health educators and site assessment reviewers. Community health educators have been involved in answering community questions and assisting in communication coaching with technical staff. The site assessment staff assisted in the review of the technical materials.

**Appendix A Maps (if relevant zoning, sensitive populations, risk isopleths etc.)**

Risk isopleths, maps of sensitive populations and zoning maps are available in the CL&E report. This Impact Summary and the CL&E report will be included in the technical support document.

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## **Attachment 10**

### **Outreach Activities Summary**

## Abbott Northwestern Hospital Permit Application Outreach Tracking

### Permit Application Outreach Tracking

Date	What	Purpose	Additional Notes
5/1/2012	Webpage update	Posted Abbott application to webpage to make app available to public	
5/1/2012	Application to Library	Application to Franklin Library, with reference librarian to make app available to public	
5/1/2012	Govdelivery Email/Text message	Announced that app is received at MPCA and where to find it (web, library, MPCA offices) and review it, also info session will be ehld, details to follow.	
5/7/2012	Govdelivery Email/Text message	Announcement for May 31 2012 information session	446 email subscribers, 4 text subscribers
5/7/2012	Webpage update	Posted announcement of information session to webpage	
5/7/2012	Email	Email to community leaders that have helped identify location and time for info session. Thanking them and inviting them to share the info session details with others.	
5/14/2012	Facebook event created	Social media form for announcing of May 31 information session	
5/14/2012	Email	Email to community member (Nimco Ahmed) inviting her to share the information with others who may be interested.	
5/21/2012	Notice to Media	Sent calendar alert to TC Daily Planet	
5/21/2012	Govdelivery Email/Text message	Reminder of Information Session date/time/location	
5/22/2012	Email	Email to Tribal contact inviting involvement	
5/22/2012	Notice to Media	The Circle and The Alley - local media outlets	
5/29/2012	Email	Email to community leaders that have helped identify location and time for info session asking them to share the info session details with others.	
5/29/2012	Govdelivery Email/Text message	Reminder of Information Session date/time/location	452 email subscribers, 5 text subscribers
5/31/2012	Information Session	At St Paul's Lutheran Church, Tim Grote of Abbot, Ryan Birkenholz of Golder Assoc, Kristie Ellickson and Sarah Sevcik of MPCA available to answer questions about Abbott's proposed project and general permitting questions	7 attendees
7/5/2012	Community Meeting	Kristie Ellickson and Sarah Sevcik attended the Phillips West Neighborhood Community Meeting to answer questions about the Abbott permitting process.	~15-20 attendees
8/22/2012	Govdelivery Email/Text message	Notice that review of the Abbott air permit contines	480 email subscribers, 5 text subscribers
8/23/2012	Email	Email to community leaders to let them know we sent out email update through govdelivery and to invite them to suggest additional outreach ideas during the review.	



9/24/2012	Govdelivery Email/Text message	Notice that a revised CL&E Analysis Report is now posted to MPCA website.	478 email subscribers, 5 text subscribers.
12/6/2012	Public Notice	Published in StarTribune	
12/7/2012	Govdelivery Email/Text message	Announcement of public notice and comment period. Links to application materials, draft permit, tesd, etc.	
12/10/2012	Govdelivery Email/Text message	Announcement of public notice and comment period. Links to application materials, draft permit, tesd, etc.	512 email subscribers, 5 text subscribers
12/10/2012	News Release	To all media in Hennepin County and neighboring counties. Also, sent directed request to The Alley, TC Daily Planet and The Circle to post on their webpages.	
12/11/2012	Email	Sent copy of news release to local community leaders requesting that the info get posted to the neighborhood websites.	
12/17/2012	Govdelivery Email/Text message	Announcement of public notice, Info now available on MPCA webpage.	514 subscribers, 5 text
1/2/2013	Govdelivery Email/Text message	Reminder of upcoming public meeting	521 subscribers, 5 text
1/8/2013	Govdelivery Email/Text message	Reminder of Meeting tonight	518 subscribers, 5 text
1/8/2013	Public Meeting	At The Center for Changing Lives. Kristie Ellickson and Sarah Sevcik of MPCA provided presentation and answered questions. Tim Grote of Abbot, Ryan Birkenholz of Golder Assoc were also available to answer questions specific to Abbott operations.	7 attendees



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## **Attachment 11**

### **EMERGENCY ENGINE TEST PLAN**

## Attachment 11

Abbott Northwestern Hospital Permit No. 05300061-002

### **ROUTINE MONTHLY TESTING (EACH ENGINE/GENERATOR)**

The following procedure applies to all of the emergency generators except for the three heart hospital generators:

1. Twelve times per year, the engine is started by simulating power outage
2. The engine shall start
3. The emergency electrical power will be transferred to the area served by the Automatic Transfer Switch (ATS) within  $\leq 10$  seconds.
4. The engine will pick up the entire load of the emergency circuits within the area served, the load is not constant, will varied based on the activities of the area served.
5. The engine is operated under load approximately 60% to 75% load for approximately 40 minutes.
6. The generator load is disconnected from the switchgear and the engine load is brought down to idle where it operates approximately 15 to 20 minutes to cool down and is then shut off automatically.

The following procedures apply to the three heart hospital generators:

- Twelve times per year, the three (3) Heart Hospital generators are tested using the same method as the Main Hospital, however because these generators serve the same area, the following differences apply:
  - All three (3) generators will start within  $\leq 10$  seconds.
  - When the load has been established, the third generator will drop if not needed (this is determined based on the actual load of the areas served). Electronic instrumentation, controls and sensors (PLC) read the load and determine the number of generators needed. If the electrical load can be served with two (2) generators the third will drop off the circuit and shut down within 20 minutes.
  - The two engines will be operated under load approximately for 40 minutes and 15 to 20 minutes on cooling mode with no load.
  - On the same day this process is repeated to include the third generator under the same load, process, and time requirements. The load operating the HH per generator is approximately 55%.

### **4 HR TESTING EVERY 36 MONTHS**

This test is performed for each generator individually including all Abbott Northwestern Hospital campus emergency electrical generators. The heart hospital generators are tested individually for this test. The testing procedure for each engine is as follows:

- Engine is started and operated at the following loads
  - 30 minutes at 25% Load
  - 30 minutes at 50% Load
  - 1 Hour at 75% Load
  - 2 Hours at 30% Load
- Engine load is reduced to idle and engine is operated for 20 minutes for cool down