AIR PERMIT APPLICATION TO CONSTRUCT
PROPOSED ELECTRIC GENERATION PLANT
CANNON FALLS ENERGY CENTER
CANNON FALLS, GOODHUE COUNTY, MINNESOTA

FOR

INVENERGY CANNON FALLS, LLC

Job Number: 25365164
September 2, 2004

AIR PERMIT APPLICATION TO CONSTRUCT
CANNON FALLS ENERGY CENTER
PROPOSED ELECTRIC GENERATION PLANT
CANNON FALLS, GOODHUE COUNTY, MINNESOTA

Submitted on behalf of

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1.0 INTRODUCTION

Invenergy Cannon Falls, LLC ("Invenergy Cannon Falls") is proposing to construct an independent electric generation plant in the City of Cannon Falls in Goodhue County, Minnesota (Refer to Figure 1-1). The project proposed by Invenergy Cannon Falls will involve the installation of a nominal 357 MW simple cycle combustion turbine plant that will provide peaking electricity to the utility grid. A more detailed discussion of the proposed project, referred to as the Cannon Falls Energy Center, is provided in Section 2.0.

It is Invenergy Cannon Falls's understanding that 7007.0150 of the Minnesota Administrative Rules stipulates that no person shall construct, modify, reconstruct or operate an emissions unit, emission facility or stationary source except in compliance with an air emission permit from the agency.

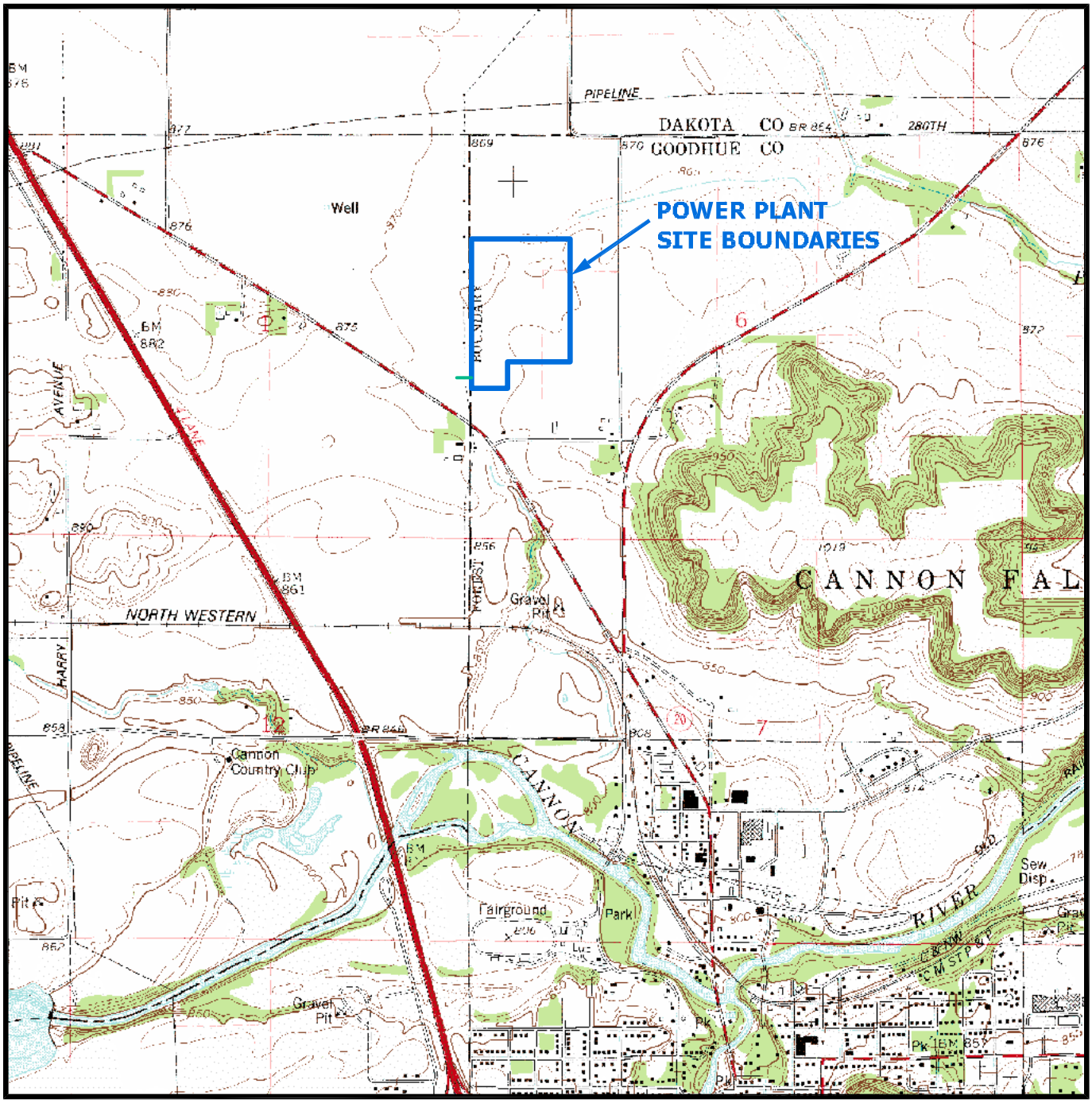
This document, prepared by URS Corporation (URS) for Invenergy Cannon Falls, constitutes a complete air permit application for the construction of the proposed plant in Goodhue County, Minnesota. This application complies with applicable Minnesota and federal air pollution control regulations. Because the plant will be classified as a "peaking plant", potential air pollutant emission rates will be limited to levels that are below the applicability threshold levels associated with the Prevention of Significant Deterioration (PSD) Regulations. The specific limitations being proposed by Invenergy Cannon Falls are further discussed in Section 5 of this air permit application.

1.1 APPLICATION CONTENT

Included in this application for the proposed project, is the following information:

- A description of the site area characteristics, proposed project configuration and equipment (including a site plot plan and a process flow diagram) and associated air pollution control equipment is contained in Sections 2.1, 2.2 and 2.3;

- Potential air pollutant emissions resulting from the proposed project are summarized in Sections 2.4 and 2.5;



SCALE: 1:24 000

1 0 1 MILE

1000 0 1000 2000 3000 4000 5000 6000 7000 FEET

1 .5 0 1 KILOMETER

NORTH

MAP REFERENCE:

PORTION OF U.S.G.S. QUADRANGLE MAP
7 ½ MINUTE SERIES (TOPOGRAPHIC)
CANNON FALLS, MINNESOTA 1974

QUADRANGLE LOCATION

CANNON FALLS ENERGY CENTER
CANNON FALLS, MINNESOTA

FIGURE 1-1
SITE LOCATION MAP

DATE: JUNE 10, 2004	
JOB NO.: 25365157	
DRAWN BY: MAR	CHK'D BY: EM
SCALE: AS SHOWN	

URS
1701 GOLF ROAD, SUITE 1000
ROLLING MEADOWS, ILLINOIS 60008
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FAX: 847.228.1115

- A discussion of the applicable federal and State of Minnesota rules and regulations that may pertain to the proposed project are presented in Section 3.0;

- A discussion of the impacts on ambient air quality associated with the proposed plant is provided in Section 4.0. These impact analyses were performed by Invenergy Cannon Falls on a voluntary basis;

- The construction permit terms and conditions being proposed by Invenergy Cannon Falls are identified in Section 5.0;

- The completed appropriate application forms for the proposed project are presented in Appendix A;

- Appendix B presents the custom fuel monitoring plan;

- Appendix C presents the Air Emissions Risk Analysis (AERA); and

- Appendix D presents the dispersion modeling input and output files obtained from the air quality impact analysis.

A copy of the USEPA Certificate of Representation and an Acid Rain Permit Application will be submitted to the state agency under separate cover.

2.0 DESCRIPTION OF PROPOSED PROJECT

The proposed project (Cannon Falls Energy Center) will be located in the City of Cannon Falls in Goodhue County, Minnesota. The location of the proposed project is depicted in Figure 1-1. The following subsections provide a description of the project site characteristics (Section 2.1), a description of the proposed project's configuration and equipment (Section 2.2), a description of the proposed air pollution control equipment (Section 2.3), and potential air pollutant emissions associated with the project (Sections 2.4 and 2.5).

2.1 SITE CHARACTERISTICS

Site area characteristics related to the proposed project site including wind flow, rural/urban land use classification, topography, and current ambient air quality status are discussed below.

2.1.1 Wind Flow Pattern

Measurements of surface wind flow data from the National Weather Service (NWS) station in Minneapolis/St. Paul Minnesota were considered to be representative of the local meteorology at the project site. Annual wind roses for the years 1987-1991 are presented in Figures 2-1 through 2-5, respectively. Figure 2-6 presents the cumulative annual wind rose based on the 5-year period.

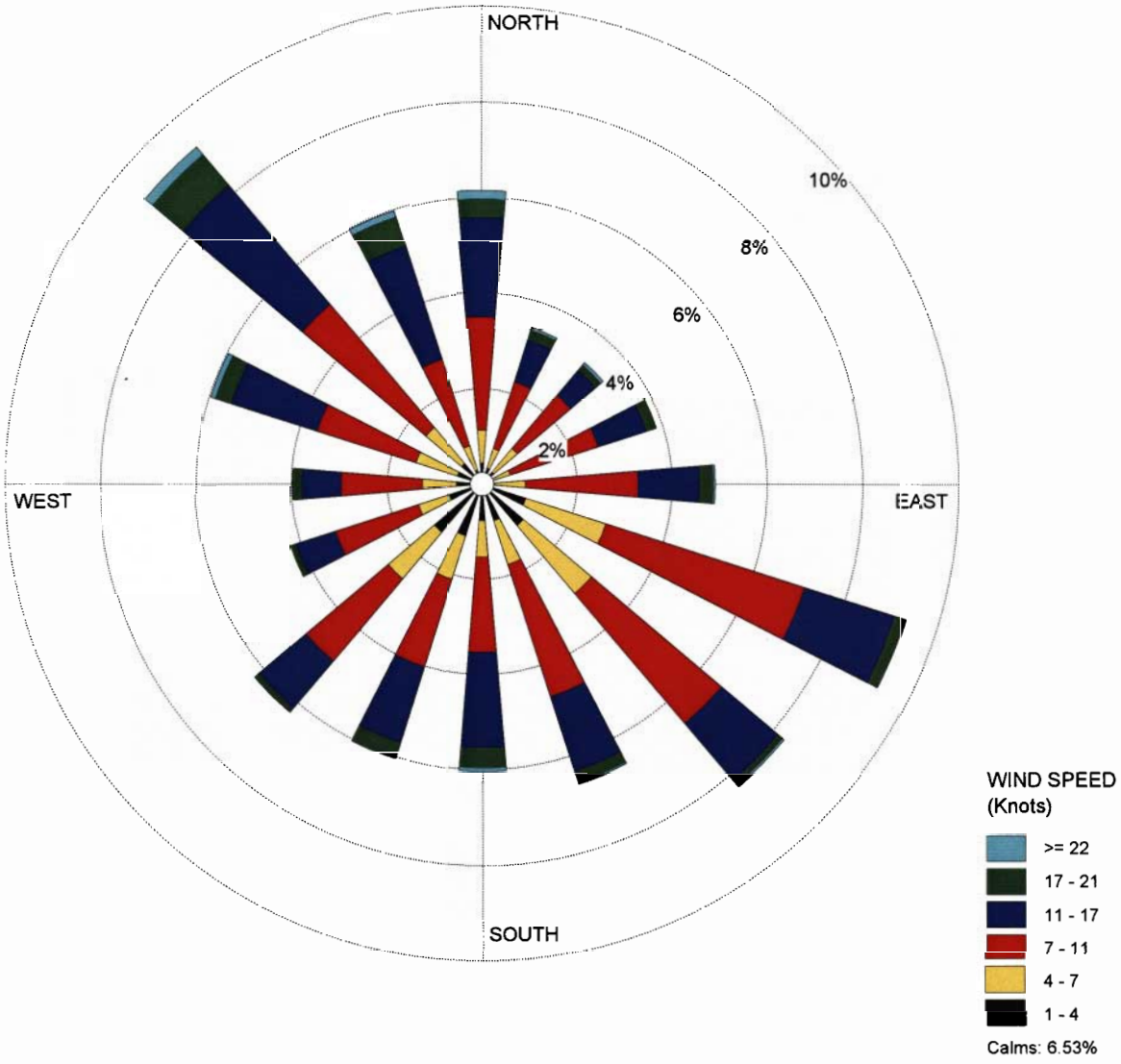
2.1.2 Rural/Urban Land Use Classification

A technique was developed by Irwin [United States Environmental Protection Agency (USEPA), 1979] to classify a site area as either rural or urban for purposes of using rural or urban dispersion coefficients. The classification can be based on either average heat flux, land use, or population density within a 3-kilometer (km) radius from the proposed project site. Of these, the USEPA has specified that land use is the most definitive criterion. The rural/urban classification based on land use is as follows:

WIND ROSE PLOT:

Invenergy LLC, Cannon Falls Energy Center
Minneapolis-St.Paul/St.Cloud, MN Annual Wind Rose for 1987

DISPLAY:
Wind Speed
Direction (blowing from)



COMMENTS: FIGURE 2-1

FIGURE 2-1

DATA PERIOD:
1987
Jan 1 - Dec 31
00:00 - 23:00

CALM WINDS:
6.53%

AVG. WIND SPEED:
9.15 Knots

COMPANY NAME:
URS Corporation

MODELER:
JAK

TOTAL COUNT:
8760 hrs.

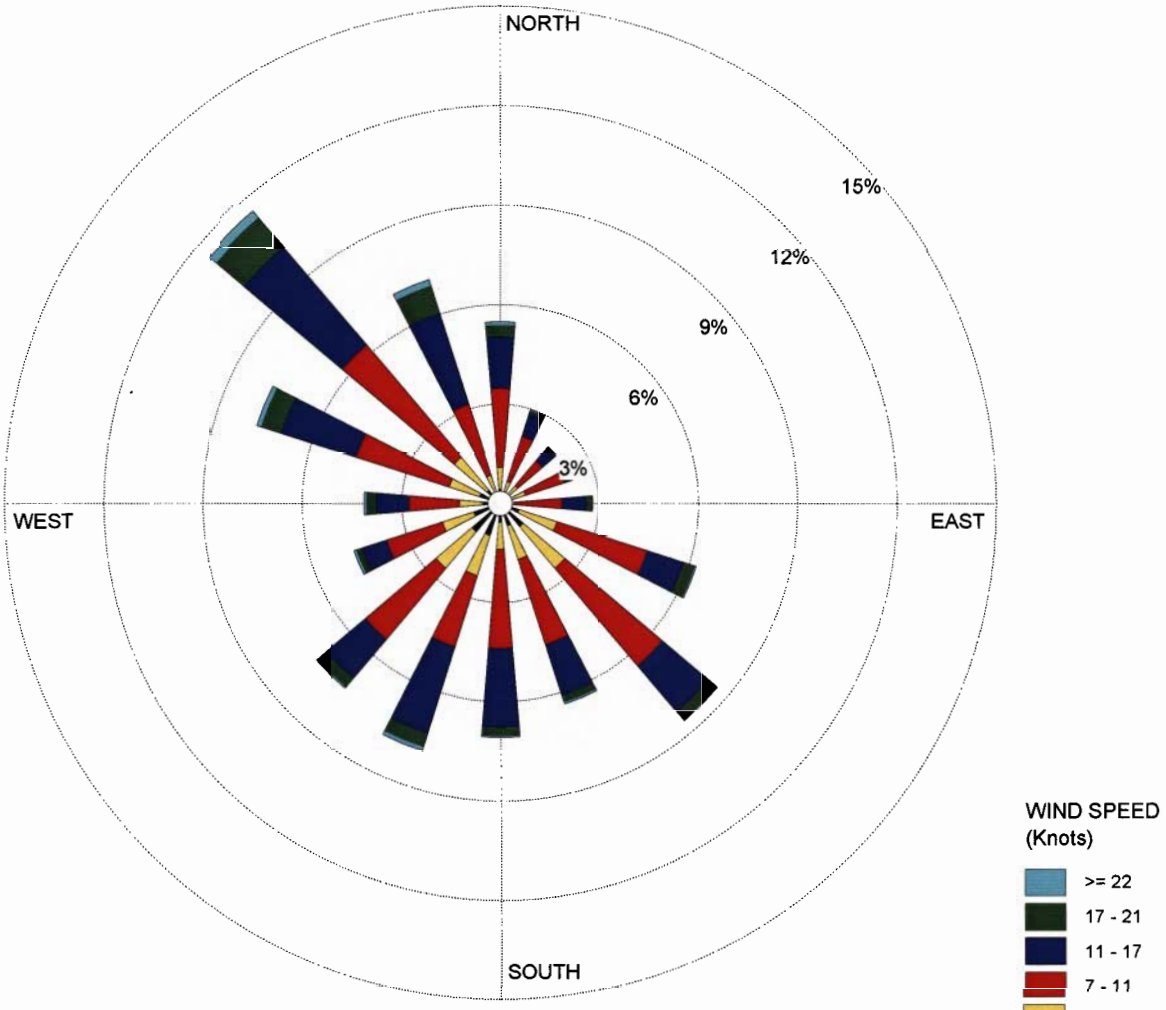
DATE:3/24/04
8/31/2004

PROJECT NO.: 25365058.05101
25365164.05101

WIND ROSE PLOT:

Invenergy LLC, Cannon Falls Energy Center
Minneapolis-St.Paul/St.Cloud, MN Annual Wind Rose for 1988

DISPLAY:
Wind Speed
Direction (blowing from)



COMMENTS: FIGURE 2-1

FIGURE 2-2

DATA PERIOD:
1988
Jan 1 - Dec 31
00:00 - 23:00

CALM WINDS:
5.60%

AVG. WIND SPEED:
9.49 Knots

COMPANY NAME:
URS Corporation

MODELER:
JAK

TOTAL COUNT:
8784 hrs.

DATE:3/24/04
8/31/2004

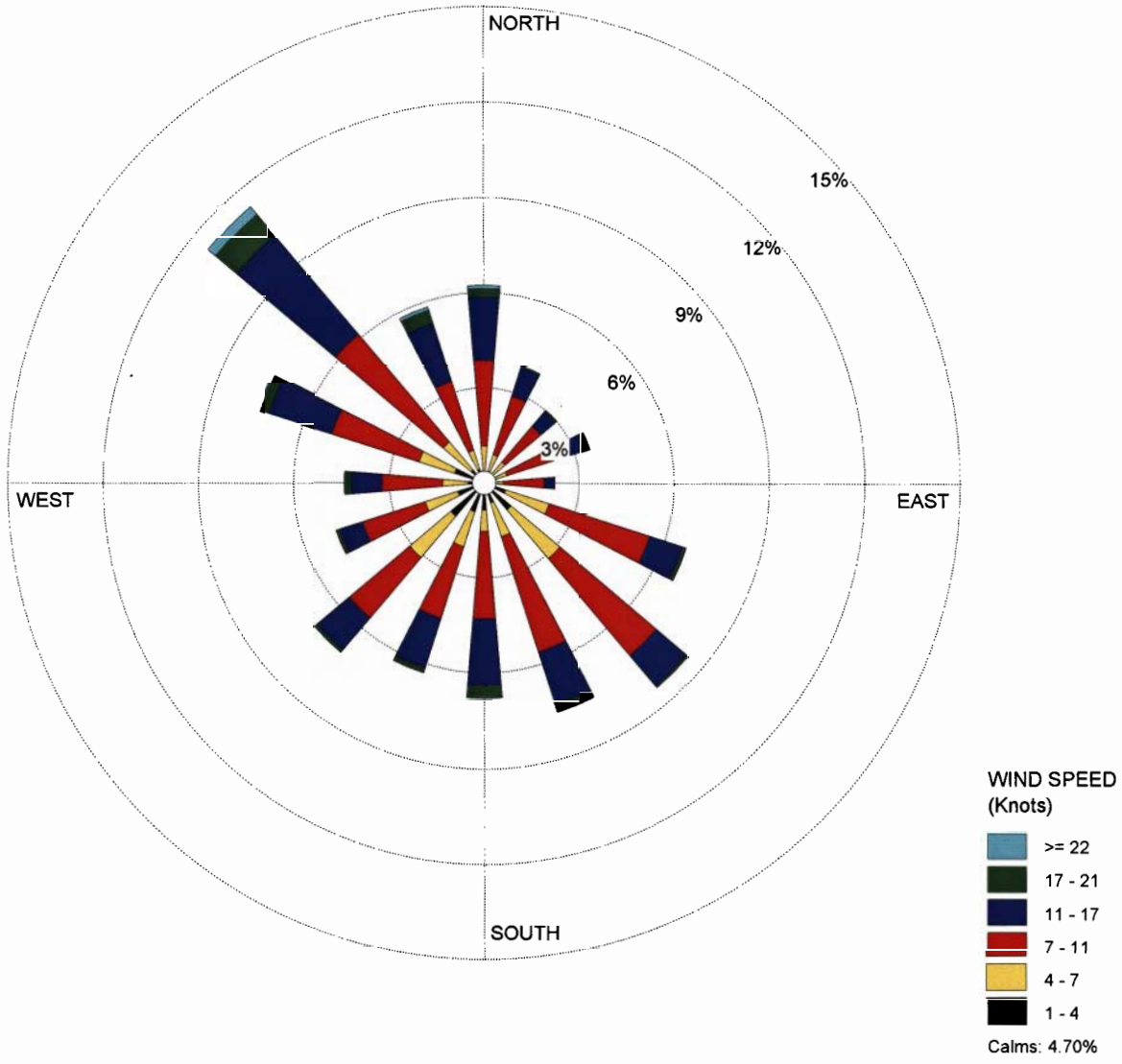
PROJECT NO.: 25365058.05101
25365164.05101

WRPLOT View - Lakes Environmental Software

WIND ROSE PLOT:

Invenergy LLC, Cannon Falls Energy Center
Minneapolis-St.Paul/St.Cloud, MN Annual Wind Rose for 1989

DISPLAY:
Wind Speed
Direction (blowing from)



COMMENTS: FIGURE 2-1

FIGURE 2-3

DATA PERIOD:
1989
Jan 1 - Dec 31
00:00 - 23:00

CALM WINDS:
4.70%

AVG. WIND SPEED:
8.93 Knots

COMPANY NAME:
URS Corporation

MODELER:
JAK

TOTAL COUNT:
8760 hrs.

DATE:3/24/04
8/31/2004

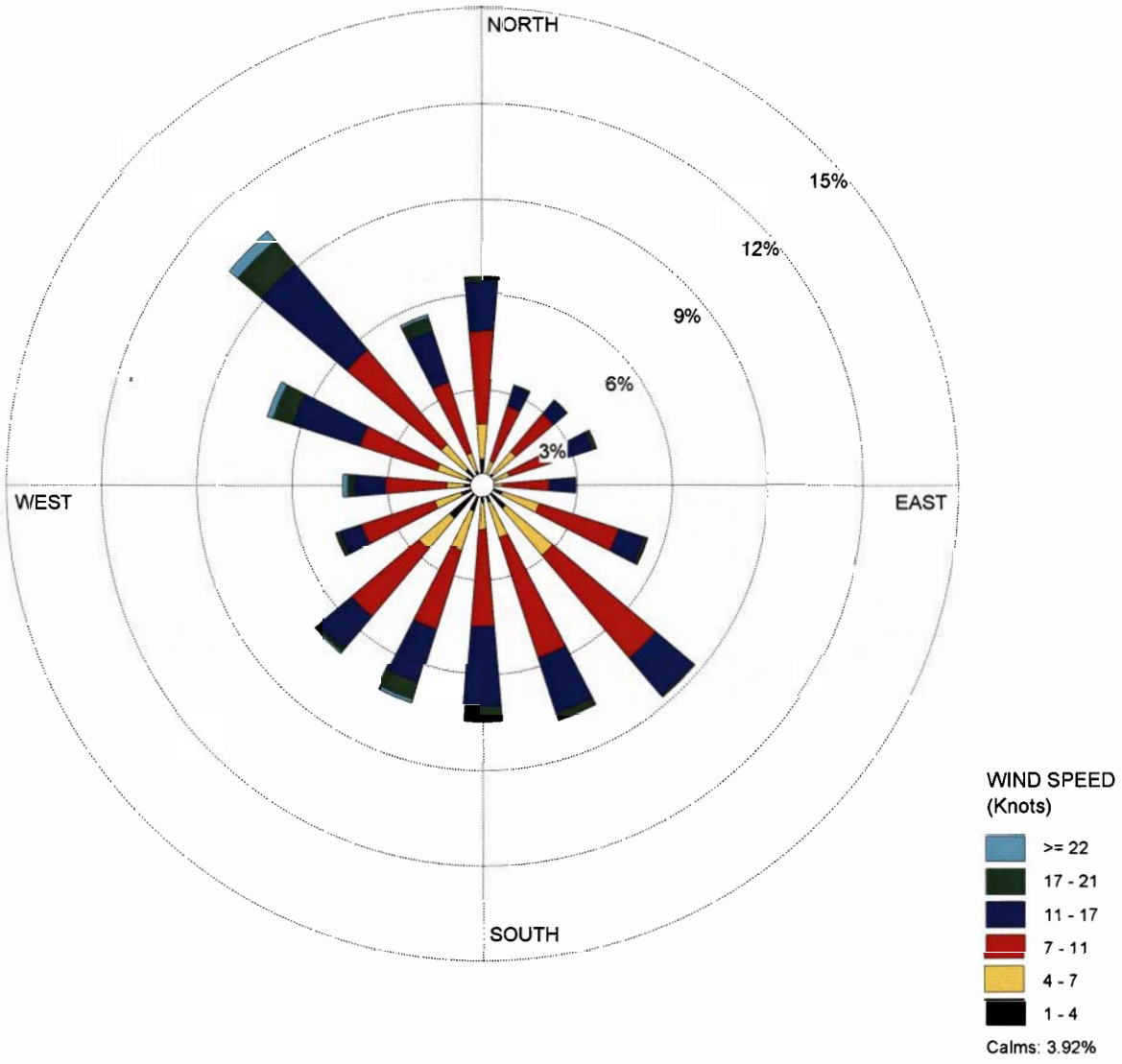
PROJECT NO.: 25365058.05101
25365164.05101

WRPLOT View - Lakes Environmental Software

WIND ROSE PLOT:

Invenergy LLC, Cannon Falls Energy Center
Minneapolis-St.Paul/St.Cloud, MN Annual Wind Rose for 1990

DISPLAY:
Wind Speed
Direction (blowing from)



COMMENTS: FIGURE 2-1

FIGURE 2-4

DATA PERIOD:
1990
Jan 1 - Dec 31
00:00 - 23:00

CALM WINDS:
3.92%

AVG. WIND SPEED:
9.24 Knots

COMPANY NAME:
URS Corporation

MODELER:
JAK

TOTAL COUNT:
8760 hrs.

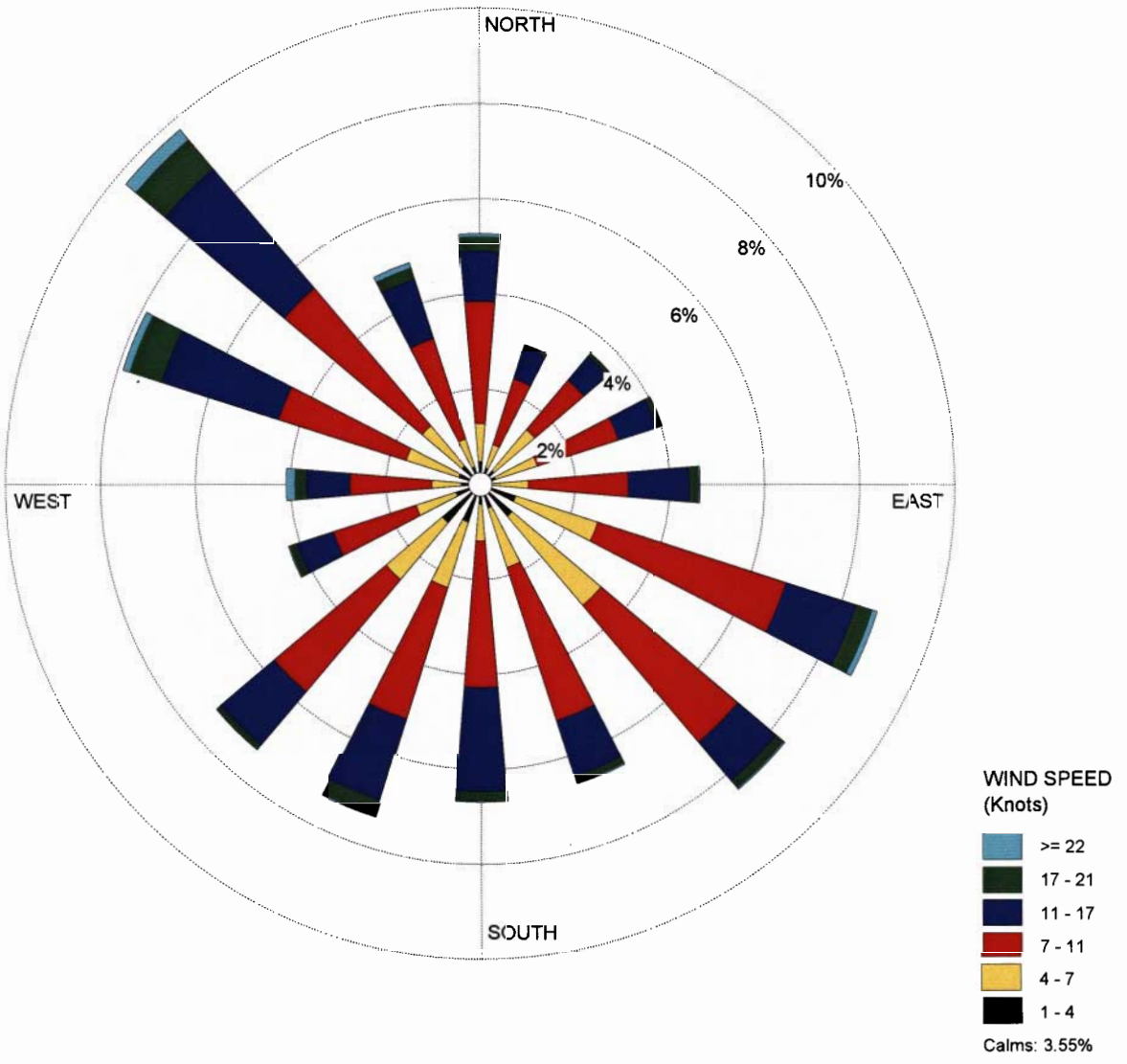
DATE:3/24/04
8/31/2004

PROJECT NO.: 25365058.05101
25365164.05101

WIND ROSE PLOT:

Invenergy LLC, Cannon Falls Energy Center
Minneapolis-St.Paul/St.Cloud, MN Annual Wind Rose for 1991

DISPLAY:
Wind Speed
Direction (blowing from)



COMMENTS: FIGURE 2-1

FIGURE 2-5

DATA PERIOD:
1991
Jan 1 - Dec 31
00:00 - 23:00

CALM WINDS:
3.55%

AVG. WIND SPEED:
9.20 Knots

COMPANY NAME:
URS Corporation

MODELER:
JAK

TOTAL COUNT:
8760 hrs.

DATE:3/24/04
8/31/2004

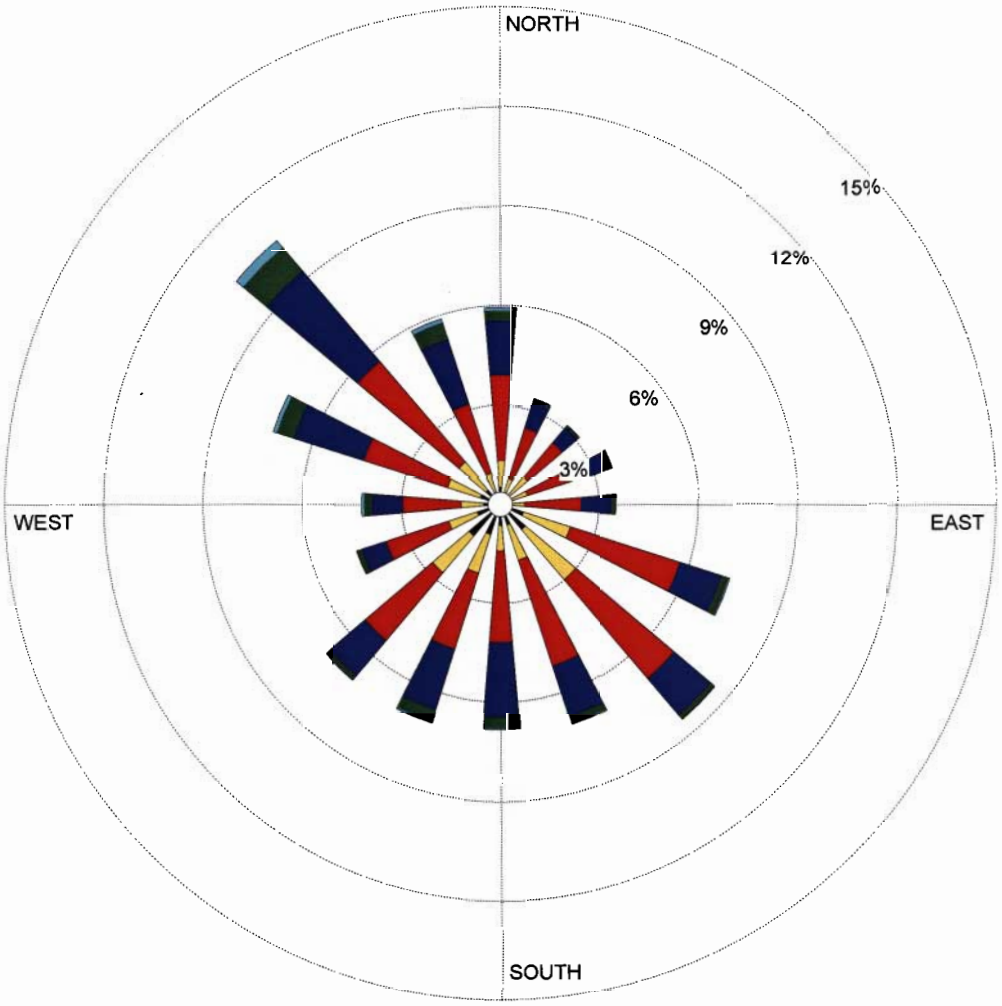
PROJECT NO.: 25365058.05101
25365164.05101

WRPLOT View - Lakes Environmental Software

WIND ROSE PLOT:

Invenergy LLC, Cannon Falls Energy Center
Minneapolis-St.Paul/St.Cloud, MN Combined Annual Wind Rose

DISPLAY:
Wind Speed
Direction (blowing from)



WIND SPEED
(Knots)

- >= 22
- 17 - 21
- 11 - 17
- 7 - 11
- 4 - 7
- 1 - 4

Calms: 4.86%

COMMENTS: FIGURE 2-1

FIGURE 2-6

DATA PERIOD:
1987 1988 1989 1990 1991
Jan 1 - Dec 31
00:00 - 23:00

COMPANY NAME:
URS Corporation

MODELER:
JAK

CALM WINDS:
4.86%

TOTAL COUNT:
43824 hrs.

AVG. WIND SPEED:
9.20 Knots

DATE:3/24/04
8/31/2004

PROJECT NO.: 25365058.05101
25365164.05101

> *Using the land use typing scheme established by Auer (Auer, 1978), an urban classification of the site area requires more than 50 percent of the following land use types: heavy industrial (I1), light-moderate industrial (I2), commercial (C1), single-family compact residential (R2), and multi-family compact residential (R3). Otherwise, the site area is considered rural. (Refer to Table 2-1).*

Based on using the land use classification scheme, the rural classification comprises greater than 50% of the area within a 3-kilometer radius surrounding the proposed site. Thus, the proposed project and surrounding area is considered rural (see Figure 1-1), allowing the use of rural dispersion coefficients in the air quality dispersion model that will be employed to perform the air quality impact assessment.

2.1.3 Topography

The elevation at the project site is approximately 865 feet above sea level (ASL). The topography surrounding the site can be described as generally flat with some terrain elevation variation. Therefore, terrain elevations will be considered in the voluntary air quality impact assessment performed in support of the proposed project.

2.1.4 Air Quality Status

The proposed Cannon Falls Energy Center will be located in Goodhue County. The current air quality status of the county is as follows:

AIR POLLUTANT	ATTAINMENT STATUS
Nitrogen Dioxides (NO_2)	Cannot be classified or better than national standards
Sulfur Dioxide (SO_2)	Cannot be classified or better than national standards
Particulate Matter less than 10 : m (PM_{10})	Cannot be classified or better than national standards
Carbon Monoxide (CO)	Cannot be classified or better than national standards
Ozone (O_3)	Cannot be classified or better than national standards

TABLE 2-1

IDENTIFICATION AND CLASSIFICATION OF LAND USE TYPES

TYPE	USE AND STRUCTURES	VEGETATION
I1	**Heavy Industrial** Major chemical, steel and fabrication industries; generally 3-5 story buildings, flat roofs	Grass and tree growth extremely rare; <5% vegetation
I2	**Light-Moderate Industrial** Railyards, truck depots, warehouses, industrial parks, minor fabrications; generally 1-3 story buildings, flat roofs	Very limited grass, trees almost totally absent; <5% vegetation
C1	**Commercial** Office and apartment buildings, hotels; >10 story heights, flat roofs	Limited grass and trees; <15% vegetation
R1	**Common Residential** Single-family dwellings with normal easements; generally one story, pitched roof structures; frequent driveways	Abundant grass lawns and lightly to moderately wooded; >70% vegetation
R2	**Compact Residential** Single, some multiple, family dwellings with close spacing; generally <2 story, pitched roof structures; garages (via alley), no driveways	Limited lawn sizes and shade trees; <30% vegetation
R3	**Compact Residential** Old multi-family dwellings with close (<2 m) lateral separation; generally 2 story, flat roof structures; garages (via alley) and ash pits, no driveways	Limited lawn sizes, old established shade trees; <35% vegetation
R4	**Estate Residential** Expensive family dwellings on multi-acre tracts	Abundant grass lawns and lightly wooded; >80% vegetation
A1	**Metropolitan Natural** Major municipal, state, or federal parks, golf courses, cemeteries, campuses; occasional single-story structures	Nearly total grass and lightly wooded; >95% vegetation
A2	**Agricultural Rural**	Local crops (e.g., corn, soybeans); 95% vegetation
A3	**Undeveloped** Uncultivated, wasteland	Mostly wild grasses and weeds, lightly wooded; >90% vegetation
A4	**Undeveloped Rural**	Heavily wooded; 95% vegetation
A5	**Water Surface** Rivers, lakes	

2.2 PROPOSED PROJECT CONFIGURATION AND EQUIPMENT

The proposed project will be located in the City of Cannon Falls in Goodhue County, Minnesota (refer to Figure 1-1). A site plan of the proposed project is depicted in Figure 2-7. The proposed project will be located on a 55 acre site. As shown in Figure 2-7, the proposed project will be equipped with the equipment listed below. A brief description of each piece of equipment, along with a discussion on the equipment's potential to emit air pollutants, also follows.

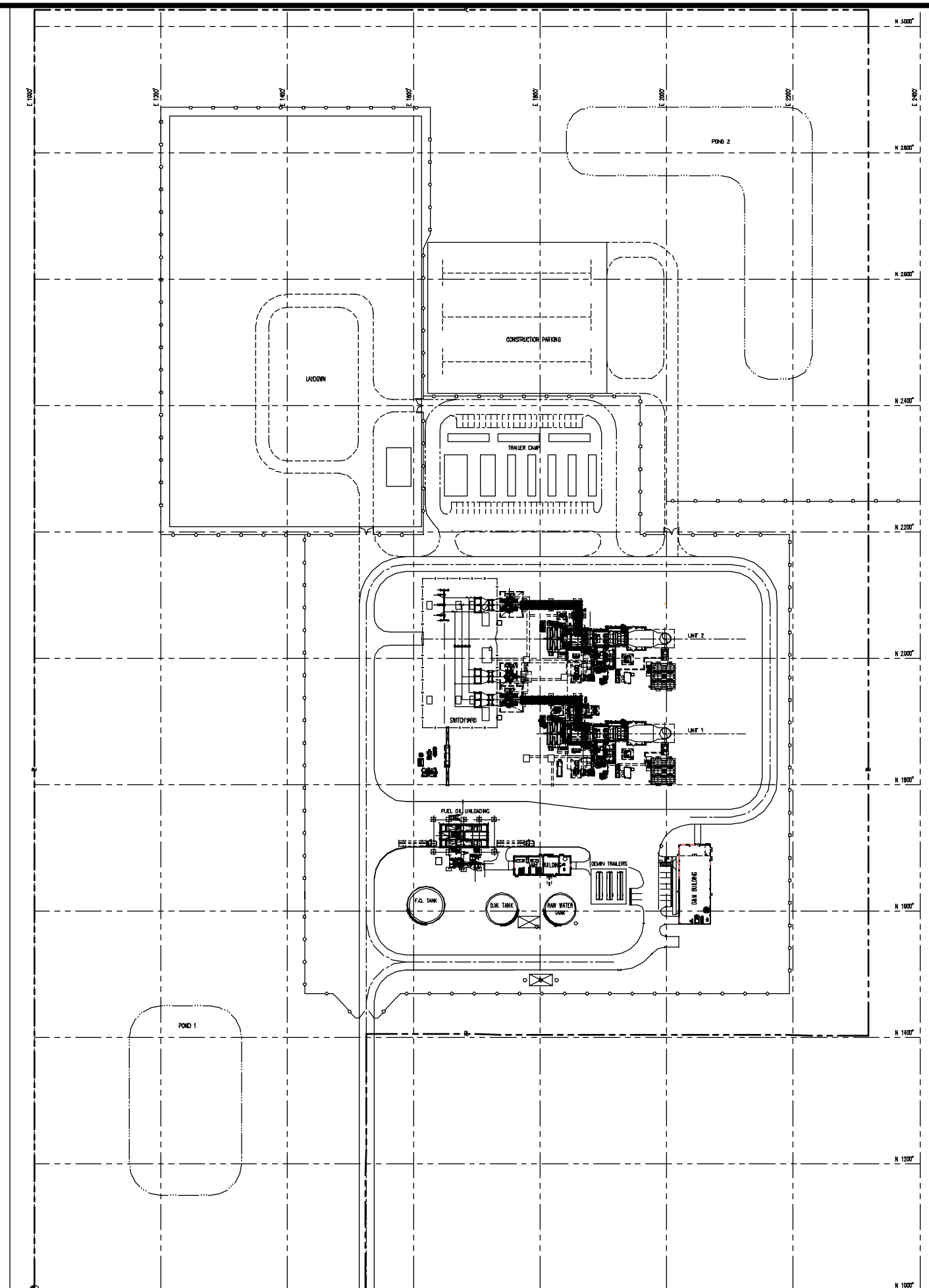
- Two Natural Gas/Distillate Fuel Oil Fired Simple Cycle Combustion Turbines;
- 750,000 Gallon Distillate Fuel Oil Storage Tank;
- One Exhaust Stack for Each Combustion Turbine Unit;
- One Natural Gas Fired Water Bath Gas Heater; and
- One Diesel Fired Fire Water Pump and Associated Storage Tank (day tank).

A simplified process flow diagram of the simple cycle combustion turbines associated with the proposed project is shown in Figure 2-8.

2.2.1 Proposed Simple Cycle Combustion Turbines

The proposed project will involve the installation of two simple cycle combustion turbines that will have the capability to combust either natural gas or low sulfur distillate fuel oil. Each combustion turbine will be equipped with a dry low NO_x combustor. During the combustion of the fuel oil, water injection will be employed. Specifications associated with this equipment are noted below.

- Turbine Type: General Electric (GE 7FA Class);
- Combustion Turbine Electrical Output (per turbine):Gross Power 185 megawatts (MWs);
- Combustion Turbine Heat Input (per turbine): 1,586 MMBtu/hour (LHV) (based on natural gas combustion, operating conditions of 45 ^{o}F, 60% relative humidity and 100% turbine load) and 1,796 MMBtu/hr (LHV) (based on distillate fuel oil combustion, operating conditions of 45 ^{o}F, 60% relative humidity and 100% turbine load);
- Fuel: Pipeline natural gas as the primary fuel and low sulfur distillate fuel oil as a backup fuel; and



NORTH

BAR SCALE

0 200' 400' 600'

SCALE: 1"=200'-0"

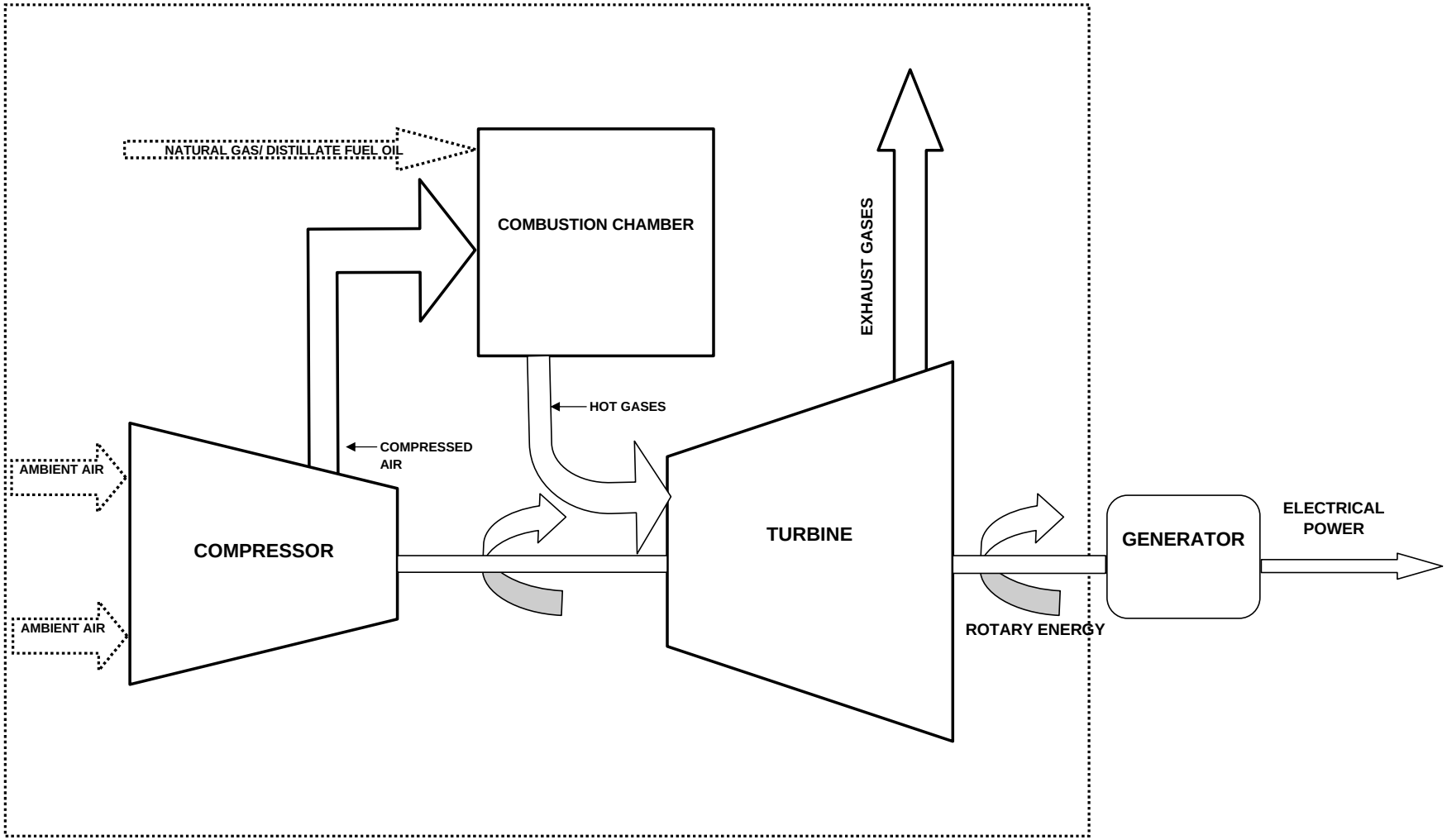
CANNON FALLS ENERGY CENTER
CANNON FALLS, MINNESOTA

FIGURE 2-7
PROPOSED PROJECT SITE LAYOUT DRAWING

DATE:	JULY 30, 2004
JOB NO.:	25365157
DRAWN BY:	MAR
CHK'D BY:	EM
SCALE:	AS SHOWN

URS
1701 GOLF ROAD, SUITE 1000
ROLLING MEADOWS, ILLINOIS 60008-4227
PHONE: 847.228.0707
FAX: 847.228.1115

FIGURE 2-8
PROCESS FLOW DIAGRAM - SIMPLE CYCLE COMBUSTION TURBINE



- The combustion turbines will also have the capability of injecting steam for the generation of additional power. This process is referred to as power augmentation.

Invenergy Cannon Falls has determined that the two combustion turbines could have four potential operating scenarios:

Scenario #1 – Operation of the combustion turbines using natural gas;

Scenario #2 – Operation of the combustion turbines using distillate fuel oil;

Scenario #3 – Operation of the combustion turbines using natural gas and power augmentation; and

Scenario #4 – Operation of the two combustion turbines using a combination of scenarios #1 through 3 noted above.

Invenergy Cannon Falls is proposing to limit operation of the combustion turbines (and supporting equipment) so that potential criteria and hazardous air pollutant emissions would be less than the major source threshold. Estimated air pollutant emission rates for the two combustion turbines as well as the entire plant are provided in Sections 2.4 and 2.5.

2.2.2 Proposed Natural Gas Fired Water Bath Gas Heater

A 9 MMBtu/hour natural gas fired water bath gas heater will be utilized for the proposed project. This heater will heat the natural gas prior to its use as fuel for the combustion turbines to maintain the required level of superheat in the gas supplied to the combustors. The heater will be in operation any time a combustion turbine is firing natural gas. See Section 2.4 for estimated air pollutant emission rates associated with this equipment.

2.2.3 Proposed Emergency Fire Water Pump

An approximately 290 horsepower diesel fired emergency fire water pump will be installed to be used only during emergency situations to operate the plant's fire equipment. However, the water pump will be operated (typically a few hours) on a monthly basis to maintain the integrity and operational readiness of the equipment. Annual hours of operation are anticipated to be less than 100 hours per year during non-emergency situations.

Minimal amounts of air pollutants will be generated during the burning of diesel fuel in this water pump. This device will be equipped with its own exhaust stack. Refer to Section 2.4 for estimated air pollutant emission rates associated with this emergency fire water pump.

2.2.4 Fuel Oil Storage Tanks

A fixed roof above ground storage tank to support the emergency fire water pump will be installed. This tank will have a capacity of less than 1,000 gallons and will be used to store the diesel fuel oil. Due to the low volatility of this material, potential VOC emissions are anticipated to be negligible. Storage tanks that meet the criteria of an annual throughput less than 400,000 gallons and the liquid being stored to be a fuel oil #1 through #6 will be exempt. This storage tank will meet these criteria for having a throughput less than 400,000 and by using #2 fuel oil. Because of the potential for negligible emissions, no further discussion or inclusion of additional information related to this tank is provided in this application.

Invenergy Cannon Falls is also proposing to install one 750,000 gallon fixed roof aboveground storage tank to store the low sulfur distillate fuel oil that will be used in the combustion turbines. Due to the low volatility of this material, potential VOC emissions are also anticipated to be negligible.

2.3 PROPOSED AIR POLLUTION CONTROL EQUIPMENT

In order to minimize the potential air pollutant emissions associated with the proposed project, each combustion turbine will be equipped with a dry low NO_x (DLN) combustor to control NO_x emission when firing natural gas. Distillate fuel oil is also proposed for use in the combustion turbines. This fuel will be limited to a sulfur content of 0.05% by weight or less. When operating on distillate fuel oil, the combustion turbines will utilize water injection to control emissions of NO_x.

2.4 EMISSION ESTIMATES

The primary air contaminants potentially emitted from the proposed project are oxides of nitrogen (NO_x), carbon monoxide (CO), sulfur dioxide (SO_2), particulate matter (PM), volatile organic compounds (VOC), and sulfuric acid mist (H_2SO_4). For purposes of this application, emissions of particulate matter with an aerodynamic diameter of 10 microns or less (PM_{10}) have been assumed to be equivalent to emissions of PM and will be

expressed as PM/PM_{10} throughout this application. A summary of potential emissions of primary air contaminants associated with the proposed plant is provided in this section.

2.4.1 Emission Estimation Methodology

To estimate air pollutant emissions rates from the proposed simple cycle combustion turbines, natural gas fired water bath heater and emergency equipment, vendor data and "AP-42" emission factors were used in conjunction with equipment design ratings, and hours of operation.

Tables 2-2 through 2-8 summarize the potential criteria air pollutants, as well as hazardous air pollutants (HAPs) estimated for the simple cycle combustion turbines, water bath gas heater, and emergency fire water pump. The emission estimates provided in these tables reflect the potential worst case operating conditions and limited hours of operation. The emission estimates for the combustion turbines reflect limited operation so that potential air emission levels are limited to below major source threshold levels (tons per year). Section 5 of this application presents the proposed permit conditions to limit operation of the plant to below these thresholds.

2.4.2 Sulfuric Acid Mist Formation

Sulfuric acid mist (H_2SO_4) may also form downstream of the combustion zone. To determine a conservative estimate, the following assumptions were employed:

- 8% of the sulfur contained in the fuel reacts to form SO_3; and
- 100% of the SO_3 reacts to form H_2SO_4.

2.4.3 Annual and Short-Term Air Pollutant Emission Estimates

The potential annual and short-term air emission rates, expressed in tons per year and lbs/hour, were determined for each proposed piece of equipment. The emission estimation methodology selected for each piece of equipment is discussed below.

Two Simple Cycle Combustion Turbines

Table 2-2 provides the estimated annual potential to emit (PTE) emission rates (tons per year) for the two simple cycle combustion turbines on natural gas, fuel oil and with power augmentation, respectively. To determine the potential air pollutant emissions rates, vendor data was reviewed for various operating temperatures (i.e., -20 ^{o}F, 59 ^{o}F, and 95 ^{o}F) and operating loads (i.e., 100%, 75%, and 50%). Since the combustion turbines will operate over a large temperature range, the operating temperature that best

TABLE 2-2

SUMMARY OF CRITERIA AIR POLLUTANT EMISSIONS ASSOCIATED WITH TWO PROPOSED SIMPLE CYCLE COMBUSTION TURBINES
INVENERGY CANNON FALLS LLC

NATURAL GAS COMBUSTION

REGULATED AIR POLLUTANT	MAXIMUM EMISSION RATES[1] (LB/HOUR)	OPERATING EMISSIONS [2]		TWO TURBINES (TONS/YR)
		PER TURBINE (LB/HR)	PER TURBINE (TONS/YR)	
SO_2[5]	3.2	3.2	6.6	13.3
NO_X/NO_2	64.0	58.5	121.2	242.4
PM/PM_{10}	18.0	18.0	37.3	74.6
CO	32.4	28.8	59.7	119.3
VOC	3.1	2.9	5.9	11.9
H_2SO_4[5]	0.43	0.43	0.9	1.8
Operation Reduction=	52.7%	4143 hours/year		

DISTILLATE FUEL OIL COMBUSTION

REGULATED AIR POLLUTANT	MAXIMUM EMISSION RATES[1] (LB/HOUR)	OPERATING EMISSIONS [3]		TWO TURBINES (TONS/YR)
		PER TURBINE (LB/HR)	PER TURBINE (TONS/YR)	
SO_2[5]	80.0	76.0	28.6	57.3
NO_X/NO_2	352.0	320.0	120.5	241.1
PM/PM_{10}	34.0	34.0	12.8	25.6
CO	73.0	66.0	24.9	49.7
VOC	8.5	7.3	2.7	5.5
H_2SO_4[5]	10.6	10.1	3.8	7.6
Operation Reduction=	91.4%	753 hours/year		

POWER AUGMENTATION

REGULATED AIR POLLUTANT	MAXIMUM EMISSION RATES[6] (LB/HOUR)	OPERATING EMISSIONS [4]		TWO TURBINES (TONS/YR)
		PER TURBINE (LB/HR)	PER TURBINE (TONS/YR)	
SO_2[5]	3.1	3.1	4.8	9.5
NO_X/NO_2	79.0	79.0	121.1	242.2
PM/PM_{10}	18.0	18.0	27.6	55.2
CO	46.0	46.0	70.5	141.0
VOC	3.0	3.0	4.6	9.2
H_2SO_4[5]	0.41	0.41	0.6	1.3
Operation Reduction=	65%	3066 hours/year		

[1] Maximum hourly emission rates based on 100% operating load and an ambient temperature of -20 degrees F.

[2] Emissions are based on 100% load firing natural gas, 4,143 hours of operation per year (per turbine), and an ambient temperature of 45 degrees F based on the data provided by the turbine vendor.

[3] Emissions are based on 100% load firing No. 2 distillate fuel oil, 753 hours of operation per year (per turbine), and an ambient temperature of 45 degrees F as provided by the turbine vendor.

[4] Emissions shown are based on firing natural gas using power augmentation and 3,066 hours of operation per year (per turbine) and the lowest ambient temperature when power augmentation is used (59 degrees F).

[5] SO_2 emission rate based on sulfur content of 0.8 grains per 100 cubic feet of natural gas; H_2SO_4 based on 13.3% of the SO_2 emission rate.

For distillate fuel oil, the SO_2 emission rate is based on a sulfur content of 0.05% and AP-42, Section 3.1, Table 3.1-2a (April 2000); H2SO4 based on 13.3% of the SO2 emission rate.

[6] Emissions shown are based on the worst case emissions during power augmentation for the ambient temperatures and operating loads provided by the turbine vendor.

TABLE 2-3

SUMMARY OF EMISSIONS ASSOCIATED WITH THE PROPOSED WATER BATH GAS HEATER
INVENERGY CANNON FALLS LLC

POLLUTANT	EMISSIONS		HEAT INPUT	EMISSION FACTOR	EMISSIONS BASIS
	(LB/HR)	(TONS/YR)	(MMBTU/HR)	LBS/MMBTU	
SO2	0.0156	0.068	9.0	0.0017	Vendor Data
NO_X/NO_2	1.38	6.044	9.0	0.153	Vendor Data
PM/PM_{10}	0.050	0.219	9.0	0.006	Vendor Data
CO	0.85	3.723	9.0	0.094	Vendor Data
VOC	0.050	0.219	9.0	0.006	Vendor Data

Notes:

Emissions shown are based on using natural gas and operating the heater: 8760 hours/year

Maximum heat input of the proposed water bath gas heater is 9.0 MMBtu/hr.

TABLE 2-4

SUMMARY OF EMISSIONS ASSOCIATED WITH THE PROPOSED FIRE WATER PUMP
INVENERGY CANNON FALLS LLC

Pollutant	Power	Emission Factors		Emission Rates		EMISSIONS BASIS
		Hourly Rate		Hourly Rate	Annual Emission Rate	
	(BHP)	(grams/HP-hr)	(lb/HP-hr)	(lb/hr)	(tpy)	
SO2	290	0.57	0.00126	0.36	0.02	Vendor Data
NO_X/NO_2	290	5.70	0.01257	3.64	0.18	Vendor Data
PM/PM_{10}	290	0.07	0.00015	0.04	0.002	Vendor Data
CO	290	0.25	0.00055	0.16	0.01	Vendor Data
VOC	290	0.08	0.00018	0.05	0.003	Vendor Data

Notes:

Emissions shown are based on using diesel fuel and operating the pump a maximum of 100 hours per year.

TABLE 2-5

SUMMARY OF CRITERIA AIR POLLUTANT EMISSIONS ASSOCIATED WITH THE PROPOSED ELECTRIC GENERATION FACILITY
INVENERGY CANNON FALLS LLC

	POTENTIAL EMISSIONS (TONS/YR)					
	CO	**NO_X**	**PM_{10}**	**SO_2**	**VOC**	**H_2SO_4**
SIMPLE CYCLE COMBUSTION TURBINES (2) - WORST CASE OPERATING CONDITION (NATURAL GAS, DISTILLATE OIL, OR POWER AUGMENTATION)	141.0	242.4	74.6	57.3	11.9	7.6
WATER BATH GAS HEATER	3.723	6.044	0.219	0.068	0.219	-
FIRE WATER PUMP	0.01	0.18	0.002	0.02	0.003	-
TOTAL PROJECT EMISSIONS (POTENTIALS)	**144.8**	**248.6**	**74.8**	**57.3**	**12.1**	**7.6**
PSD MAJOR SOURCE THRESHOLD	**250**	**250**	**250**	**250**	**250**	**250**
PSD SIGNIFICANT EMISSION LEVELS	**100**	**40**	**15**	**40**	**40**	**7**
SUBJECT TO PSD REVIEW?	**NO**	**NO**	**NO**	**NO**	**NO**	**NO**

TABLE 2-6

SUMMARY OF HAPS ASSOCIATED WITH THE PROPOSED SIMPLE CYCLE COMBUSTION TURBINES
INVENERGY CANNON FALLS LLC

		NATURAL GAS COMBUSTION			FUEL OIL COMBUSTION		
POLLUTANT	CAS NUMBER	EMISSION FACTOR (lbs/MMBtu)[1]	TOTAL EMISSIONS (2 COMBUSTION TURBINES) (LBS/YEAR)	TOTAL EMISSIONS (2 COMBUSTION TURBINES) (TONS/YEAR)	EMISSION FACTOR (lbs/MMBtu)[2]	TOTAL EMISSIONS (2 COMBUSTION TURBINES) (LBS/YEAR)	TOTAL EMISSIONS (2 COMBUSTION TURBINES) (TONS/YEAR)
1,3-Butadiene	106-99-0	4.3E-07	**6.26E+00**	**3.13E-03**	1.6E-05	**4.74E+01**	**2.37E-02**
Acetaldehyde	75-07-0	4.0E-05	**5.82E+02**	**2.91E-01**	-	**-**	**-**
Acrolein	107-02-8	6.4E-06	**9.32E+01**	**4.66E-02**	-	**-**	**-**
Arsenic	7440-38-2	-	**-**	**-**	1.1E-05	**3.26E+01**	**1.63E-02**
Benzene	71-43-2	1.2E-05	**1.75E+02**	**8.74E-02**	5.5E-05	**1.63E+02**	**8.14E-02**
Beryllium	7440-41-7	-	**-**	**-**	3.1E-07	**9.18E-01**	**4.59E-04**
Cadmium	---	-	**-**	**-**	4.8E-06	**1.42E+01**	**7.11E-03**
Chromium	7440-47-3	-	**-**	**-**	1.1E-05	**3.26E+01**	**1.63E-02**
Ethylbenzene	100-41-4	3.2E-05	**4.66E+02**	**2.33E-01**	**-**	**-**	**-**
Formaldehyde	50-00-0	7.1E-04	**1.03E+04**	**5.17E+00**	2.8E-04	**8.29E+02**	**4.15E-01**
Lead	7439-92-1	-	**-**	**-**	1.4E-05	**4.15E+01**	**2.07E-02**
Manganese	7439-96-5	-	**-**	**-**	7.9E-04	**2.34E+03**	**1.17E+00**
Mercury	7439-97-6	-	**-**	**-**	1.2E-06	**3.55E+00**	**1.78E-03**
Naphthalene	91-20-3	1.3E-06	**1.89E+01**	**9.47E-03**	3.5E-05	**1.04E+02**	**5.18E-02**
Nickel	7440-02-0	-	**-**	**-**	4.6E-06	**1.36E+01**	**6.81E-03**
Polycyclic Aromatic Hydrocarbons	---	2.2E-06	**3.20E+01**	**1.60E-02**	4.0E-05	**1.18E+02**	**5.92E-02**
Propylene Oxide	75-56-9	2.9E-05	**4.22E+02**	**2.11E-01**	**-**	**-**	**-**
Selenium	7446-08-4	-	**-**	**-**	2.5E-05	**7.40E+01**	**3.70E-02**
Toluene	101-88-3	1.3E-04	**1.89E+03**	**9.47E-01**	**-**	**-**	**-**
Xylene	1330-20-7	6.4E-05	**9.32E+02**	**4.66E-01**	**-**	**-**	**-**
			14,959.8	**7.5**		**3,766.1**	**1.88**

Notes:

Emissions shown are based on combustion of:	Natural gas and 4143 hours of operation /year	Fuel oil and 753 hours of operation /year
Heat input of one CT based on worst case conditions (-20 deg F and 100% load)=	**1757.2 MMBtu/hour**	**1965.2 MMBtu/hour**

[1] Emission Factor Source - AP-42 (April 2000), Stationary Gas Turbines, Section 3.1, Table 3.1-3

[2] Emission Factor Source - AP-42 (April 2000), Stationary Gas Turbines, Section 3.1, Tables 3.1-4 and 3.1-5

TABLE 2-7

SUMMARY OF HAPS ASSOCIATED WITH THE PROPOSED WATER BATH GAS HEATER INVENERGY CANNON FALLS LLC

POLLUTANT	EMISSION FACTORS		EMISSIONS		TOTAL EMISSIONS
	(LB/MMscf)	(LB/MMbtu)	(LB/HR)	(TONS/YR)	(TONS/YR)
ARSENIC	2.0E-04	1.96E-07	1.76E-06	7.73E-06	7.73E-06
BERYLLIUM	1.2E-05	1.18E-08	1.06E-07	4.64E-07	4.64E-07
CADMIUM	1.1E-03	1.08E-06	9.71E-06	4.25E-05	4.25E-05
CHROMIUM	1.4E-03	1.37E-06	1.24E-05	5.41E-05	5.41E-05
COBALT	8.4E-05	8.24E-08	7.41E-07	3.25E-06	3.25E-06
LEAD	5.0E-04	4.90E-07	4.41E-06	1.93E-05	1.93E-05
MANGANESE	3.8E-04	3.73E-07	3.35E-06	1.47E-05	1.47E-05
MERCURY	2.6E-04	2.55E-07	2.29E-06	1.00E-05	1.00E-05
NICKEL	2.1E-03	2.06E-06	1.85E-05	8.12E-05	8.12E-05
SELENIUM	2.4E-05	2.35E-08	2.12E-07	9.28E-07	9.28E-07
BENZENE	2.1E-03	2.06E-06	1.85E-05	8.12E-05	8.12E-05
DICHLOROBENZENE	1.2E-03	1.18E-06	1.06E-05	4.64E-05	4.64E-05
FORMALDEHYDE	7.5E-02	7.35E-05	6.62E-04	2.90E-03	2.90E-03
HEXANE	1.8E+00	1.76E-03	1.59E-02	6.96E-02	6.96E-02
NAPTHALENE	6.1E-04	5.98E-07	5.38E-06	2.36E-05	2.36E-05
TOLUENE	3.4E-03	3.33E-06	3.00E-05	1.31E-04	1.31E-04
TOTAL HAPS FROM WATER BATH GAS HEATER =					**7.3E-02**

Notes:

Maximum heat input of the proposed water bath gas heater = 9 MMBtu/Hour

Emission factors taken from AP-42 (July, 1998), Tables 1.4-2, 1.4-3, and 1.4-4 (using 1020 btu/scf).

Calculation Method:

Emissions (tons/year) =
Heat Input (MMBtu/hour) × Emission Factor (lbs/MMBtu) × 8760 hours/year × 1 ton/2000 lbs

TABLE 2-8

SUMMARY OF HAPS ASSOCIATED WITH THE PROPOSED FACILITY
INVENERGY CANNON FALLS LLC

HAP	EMISSIONS DUE TO COMBUSTION TURBINES (WORST CASE) *	EMISSIONS FROM WATER BATH GAS HEATERS	TOTAL EMISSIONS FROM PROPOSED PLANT
	(TONS/YR)	(TONS/YR)	(TONS/YR)
ARSENIC	1.63E-02	7.73E-06	1.63E-02
BERYLLIUM	4.59E-04	4.64E-07	4.59E-04
CADMIUM	7.11E-03	4.25E-05	7.15E-03
CHROMIUM	1.63E-02	5.41E-05	1.63E-02
COBALT	-	3.25E-06	3.25E-06
LEAD	2.07E-02	1.93E-05	2.07E-02
MANGANESE	1.17E+00	1.47E-05	1.17E+00
MERCURY	1.78E-03	1.00E-05	1.79E-03
NICKEL	6.81E-03	8.12E-05	6.89E-03
SELENIUM	3.70E-02	9.28E-07	3.70E-02
BENZENE	8.74E-02	8.12E-05	8.75E-02
DICHLOROBENZENE	-	4.64E-05	4.64E-05
FORMALDEHYDE	5.17E+00	2.90E-03	5.17E+00
HEXANE	-	6.96E-02	6.96E-02
NAPTHALENE	5.18E-02	2.36E-05	5.18E-02
ACETALDEHYDE	2.91E-01	-	2.91E-01
ACROLEIN	4.66E-02	-	4.66E-02
ETHYLBENZENE	2.33E-01	-	2.33E-01
XYLENES	4.66E-01	-	4.66E-01
TOLUENE	9.47E-01	1.31E-04	9.47E-01
1,3-BUTADIENE	2.37E-02	-	2.37E-02
PROPYLENE OXIDE	2.11E-01	-	2.11E-01
POLYCYCLIC AROMATIC HC'S	5.92E-02	-	5.92E-02
	8.86E+00	7.30E-02	
	TOTAL AGGREGATE HAPS FROM PROPOSED PLANT =		**8.94**

* Worst case emission rates based on either natural gas or distillate fuel oil usage.

represents an annual average temperature (i.e. 45 ^{o}F) for the Cannon Falls area was used to estimate annual air pollutant emission rates. To reflect worst-case pound/hour emission rates, the operating temperature and load condition that resulted in the maximum pound/hour emission rate was selected.

It should be noted that the simple cycle combustion turbines will be used on an as needed basis (i.e., peak demand period). As a result, the combustion turbines will frequently be started and shut down. Since these units are capable of achieving their desired load levels in a very short period of time (less than 45 minutes), air pollutant emissions during these startup and shutdown periods are expected to be less than that which would occur under normal operating conditions.

Ancillary Equipment

To estimate air pollutant emission rates from the ancillary equipment, "AP-42" emission factors and/or vendor data were used in conjunction with the equipment design rating and hours of operation. Table 2-3 provides emission rates associated with the water bath gas heater. Emission estimates for the water bath gas heater are based on full year operation (8,760 hours). For the fire water pump, anticipated annual usage was set at 100 hours. Emission estimates based on vendor provided data are presented in Table 2-4 for the emergency fire water pump.

Summary of Potential Criteria Air Pollutants

Since potential emission rates (unlimited equipment operation) would surpass regulatory applicability threshold levels, Invenergy Cannon Falls is proposing to limit the operation of the simple cycle combustion turbines. Table 2-5 summarizes the resultant air pollutant emission rates based on limited operation of the combustion turbines while burning either natural gas, distillate fuel oil, or with power augmentation. As shown in this table, the resultant limited air pollutant emission rates are below the applicability levels that define a major stationary source under PSD requirements. Proposed permit conditions that would limit the plant's operation based on ton/year emission caps are provided in Section 5.0. Invenergy Cannon Falls will incorporate appropriate monitoring and record keeping procedures to demonstrate that the emission caps would not be exceeded on a 12 month rolling average.

2.5 HAZARDOUS AIR POLLUTANT EMISSION ESTIMATES

In addition to criteria air pollutants, the proposed equipment may generate small amounts of hazardous air pollutants (HAPs). To determine the types and quantities of HAPs emitted by the combustion turbines and the water bath gas heater, USEPA's AP-42 emission factors were used.

Table 2-6 shows the HAP emission rates for the proposed combustion turbines combusting either natural gas or distillate fuel oil. For the calculation of these HAP emission rates, it is assumed that the turbines would combust natural gas a maximum of 4,143 hours per year and distillate fuel oil for a maximum 753 hours per year. The potential HAP emission rates for the proposed water bath gas heater are shown in Table 2-7.

Facility-wide HAP emissions are presented in Table 2-8. The potential aggregate HAP emission rate will be less than 10 tons per year. This potential rate is well below the major source threshold of 25 tons per year (combined HAPs) that would trigger federal National Emission Standards for Hazardous Air Pollutants (NESHAP) requirements for controlling HAPs. In addition, emissions of each individual HAP will also be well below the major source thresholds (10 tons per year) established for individual HAPs.

3.0 REGULATORY REQUIREMENTS

This section discusses the pertinent federal, state, and local air pollution control regulations that may be applicable to the proposed project and also discusses how the proposed project will comply with these applicable regulations.

3.1 FEDERAL REQUIREMENTS

USEPA has developed regulations that are designed to control air pollution. These regulations include permitting requirements for new or modified major stationary sources located in nonattainment and attainment areas, as well as standards of performance for certain types of new sources. The requirement for major sources located in nonattainment areas is called Nonattainment Area New Source Review (NANSR) and is codified in Appendix S of 40 CFR Part 51 (Regulation No. 3, Part B, IV, D- Minnesota Code of Regulations). For attainment areas, the regulation that applies to major sources is called Prevention of Significant Deterioration (PSD) and is contained in 40 CFR Section 52.21 (Regulation No. 3, Part B, IV, D- Minnesota Code of Regulations).

The permitting requirements associated with each program are discussed in the following subsections.

3.1.1 PSD Review

The PSD regulations, amended by the USEPA on August 7, 1980 (45 FR 52675), specify that any major new stationary source or major expansion of an existing major source within an air quality attainment area is subject to PSD review. For new sources, the regulations apply to:

1. Any source type in any of 28 designated industrial source categories having potential emissions of 100 tons per year or more; or

2. Any other source having potential emissions of 250 tons per year or more of any pollutant regulated under the Clean Air Act.

Potential emissions are defined as the emissions of any pollutant at maximum design capacity (or less than maximum design capacity if specified as a permit condition), including the control efficiency of air pollution control equipment.

PSD review consists of:

- A case-by-case Best Available Control Technology (BACT) demonstration, taking into account energy, environmental, and economic impacts as well as technical feasibility;

- An ambient air quality impact analysis to determine whether the allowable emissions from the proposed project would cause or contribute to a violation of the applicable PSD increments and National Ambient Air Quality Standards (NAAQS) (refer to Table 3-1);

- An assessment of the direct and indirect effects of the proposed project on general growth, soil, vegetation, and visibility;

- Public comment, including an opportunity for a public hearing; and

- Possibly an ambient air quality monitoring program for up to one year.

An applicant may be exempted from the ambient air quality monitoring requirement if there are existing air quality monitoring data representative of the site, or if the impact from the proposed project is less than the monitoring de minimis concentrations listed in Table 3-1.

Goodhue County is designated attainment, unclassifiable, or better than the national standards, for the criteria pollutants PM, SO_2, CO, NO_2, and O_3. Based on the estimated emission rates associated with the proposed project (refer to Section 2), individual emissions of the criteria pollutants will not exceed the major source applicability thresholds of 250 tons per year. Consequently, the proposed project will not exceed the applicability criteria for the PSD regulations.

3.1.2 New Source Performance Standards (NSPS)

The New Source Performance Standards (NSPS) were developed by USEPA for specific source categories. These standards are codified in the Code of Federal Regulations (CFR) under 40 CFR Part 60. Those standards that may apply are noted below:

- Subpart GG – Standards of Performance for Stationary Gas Turbines, and

Table 3-1

NATIONAL AMBIENT AIR QUALITY STANDARDS (NAAQS), PSD INCREMENTS, SIGNIFICANT EMISSION RATES, SIGNIFICANT IMPACT INCREMENTS, AND MONITORING DE MINIMIS CONCENTRATIONS

POLLUTANT	AVERAGING PERIOD	NAAQS ($\mu g/m^3$)		PSD INCREMENTS ($\mu g/m^3$)			SIGNIFICANT EMISSION RATES (tons/year)	SIGNIFICANT IMPACT INCREMENTS ($\mu g/m^3$)	MONITORING DE MINIMIS CONCENTRATIONS ($\mu g/m^3$)
		PRIMARY	SECONDARY	CLASS I	CLASS II	CLASS III			
Total Suspended Particulate Matter (TSP)	Annual	--	--	5[a]	19[a]	37[a]	25	1	--
	24-Hour	--	--	10[a,b]	37[a,b]	75[a,b]		5	10
Particulate Matter Less than 10 µm (PM_{10})	Annual	50	[c]	4	17	34	15	1	--
	24-Hour	150[b]	[c]	8[b]	30[b]	60[b]		5	10
Sulfur Dioxide	Annual	80	--	2	20	40	40	1	--
	24-Hour	365[b]	--	5[b]	91[b]	182[b]		5	13
	3-Hour	--	1300[b]	25[b]	512[b]	700[b]		25	--
Nitrogen Dioxide	Annual	100	[c]	2.5	25	50	40	1	14
Ozone	1-Hour	235[d]	[c]	--	--	--	40[e]	--	[f]
Carbon Monoxide	8-Hour	10,000[b]	[c]	--	--	--	100	500	575
	1-Hour	40,000[b]	[c]	--	--	--		2000	--
Lead	Calendar Quarter	1.5	[c]	--	--	--	0.6	--	0.1
Total Reduced Sulfur (TRS) Reduced Sulfur Compounds	1-Hour	--	--	--	--	--	10	--	10
Asbestos	--	--	--	--	--	--	0.007	--	--
Mercury	24-Hour	--	--	--	--	--	0.1	--	0.25
Beryllium	24-Hour	--	--	--	--	--	0.0004	--	0.001
Fluorides	24-Hour	--	--	--	--	--	3	--	0.25
Vinyl Chloride	24-Hour	--	--	--	--	--	1	--	15
Sulfuric Acid Mist	--	--	--	--	--	--	7	--	--
Hydrogen Sulfide	1-Hour	--	--	--	--	--	10	--	0.2

[a] TSP increment was replaced by PM_{10} increment effective June 3, 1994.
[b] Concentration not to be exceeded more than once per year.
[c] Same as primary NAAQS.
[d] Expected number of days in which one or more hourly ozone concentrations exceed this value must be greater than 1.
[e] Emissions of volatile organic compounds.
[f] Increase in volatile organic compounds of more than 100 tons/year.

- Subpart Kb – Standards of Performance for Volatile Organic Liquid Storage Vessels

3.1.2.1 Combustion Turbines

The proposed combustion turbines will be subject to the New Source Performance Standard (NSPS) emission limitations for stationary gas combustion turbines (Subpart GG of 40 CFR Part 60). Subpart GG is applicable to all stationary combustion turbines with heat input at peak load equal to or greater than 10.7 gigajoules per hour (Gj/hour) or approximately 10 MMBtu/hour. Subpart GG regulates both SO_2 and NO_x emissions.

The SO_2 requirement covers both the allowable sulfur in fuel (<0.8 percent by weight) and emission concentrations of SO_2 (<150 ppmv at 15% O_2 on a dry basis). The use of pipeline quality natural gas (< 1.0 gr. of sulfur per 100 SCF on average) in the combustion turbine and limited quantities of distillate fuel (0.05% by weight sulfur) will easily meet the fuel requirement. The SO_2 in the exhaust gas from the use of natural gas fuel will be well below 150 ppmvd at 15% O_2. Therefore, the SO_2 requirements of Subpart GG will be achieved.

The NSPS for NO_x is expressed by the following equation:

$$STD = (0.0075 \times 14.4 / Y) + F$$

where:

STD = Allowable NO_x emissions (percent by volume dry @ 15% O_2)

Y = Manufacturer's heat rate at rated load (kJ/w-hr) LHV

F = NO_x emission allowance for fuel-bound nitrogen (typically 0 for natural gas).

The heat rate for the proposed combustion turbine is approximately 9,000 Btu/kW-hour (LHV) at average ambient conditions of 45 ^oF and base load operating conditions. This rate would increase approximately 10% when distillate fuel oil is being combusted.

$$Y = (9{,}000 \text{ Btu/kW-hr}) \times (1054.2 \text{ J/Btu}) \times (\text{kw}/1000 \text{ w}) \times (\text{kJ}/1000 \text{ J})$$
$$= 9.5 \text{ kJ/w-hr based on natural gas (10.4 kJ/w-hr based on fuel oil)}$$

Therefore, the emission limitation based on Subpart GG will be:

$$STD = 0.0075 \times (14.4/9.5)$$

= 114 ppmvd @ 15% O_2 based on natural gas

STD = 0.0075 × (14.4/10.4)

= 104 ppmvd @ 15% O_2 based on distillate fuel oil

The combustion turbines will be equipped with dry low NO_x combustors capable of achieving a NO_x emission rate of 9 ppm @ 15% O_2 while combusting natural gas, 12 ppmvd @ 15% O_2 while combusting natural gas with power augmentation, and 42 ppmvd @ 15% O_2 when combusting distillate fuel oil. Therefore, the combustion turbines will easily meet the Subpart GG NO_x emission limit of 114 ppmvd and 104 ppmvd at 15% O_2.

Subpart GG also requires monitoring of the following parameters:

- NO_x emissions while using water injection. (40 CFR 60.334(a)); and
- Sulfur and nitrogen content of the fuel being fired. (40 CFR 60.334(b)).

During combustion of distillate fuel oil in the combustion turbines, water injection will be used to limit NO_x emissions. As required in this subpart, Invenergy Cannon Falls will install and operate a continuous monitoring system to monitor and record the fuel consumption and the ratio of water being fired in the turbine. Invenergy Cannon Falls will comply with 40 CFR 60.334(b)(2), which states that owner/operators may develop a custom schedule for determination of the values based on the design and operation of the affected facility and characteristics of the fuel supply. Invenergy Cannon Falls has included a proposed custom schedule for determination of the sulfur and nitrogen contents of the fuels being fired (see Appendix B).

Invenergy Cannon Falls will comply with the requirement to conduct an initial performance test as specified in 40 CFR Part 60.8. This requirement states that an initial performance test should be conducted within 60 days after achieving the maximum production rate at which the source will be operated, but not later than 180 days after initial startup of such source. The specific test methods and procedures to comply with 40 CFR 60.8 are specified in 40 CFR 60.335.

3.1.2.2 Fuel Oil Storage Tank

A new source performance standard was developed for volatile organic liquid storage tanks. This standard referred to as Subpart Kb applies to volatile organic liquid storage tanks constructed after July 23, 1984. As stipulated in 40 CFR 60.110b(c), storage tanks

with a capacity greater than 151 m^3 (approximately 40,000 gallons) storing a liquid with a maximum true vapor pressure less than 3.5 kPa (0.5 psia) are exempt from the general provisions of (Part 60, Subpart A) and from the provisions of Subpart Kb.

The fuel oil storage tank being proposed for installation will have a storage capacity of 750,000 gallons, which exceeds the capacity threshold of 40,000 gallons; however the vapor pressure of low sulfur fuel oil (0.03 psia) is well below 0.5 psia. Thus the proposed storage tank should be exempt from the provisions of Subpart Kb.

3.1.3 Application of Stack Height Regulations

The stack height regulations promulgated by USEPA on July 8, 1985 (50 FR 27892) established a stack height limitation to assure that stack height increases and other plume dispersion techniques would not be used in lieu of constant emission controls. These regulations apply to facilities that commenced construction after December 31, 1970, and to dispersion techniques implemented after that date. The regulations specify that Good Engineering Practice (GEP) stack height is the maximum creditable stack height that a source may use in establishing its applicable State Implementation Plan (SIP) emission limitation. For stacks uninfluenced by terrain features, the determination of a GEP stack height for a source is based on the following empirical equation:

$$H_g = H + 1.5l_b$$

Where:

H_g = GEP stack height;

H = Height of the controlling structure on which the source is located, or nearby structure; and

l_b = Lesser dimension (height or width) of the controlling structure on which the source is located, or nearby structure.

Both the height and width of the structure are determined from the frontal area of the structure projected onto a plane perpendicular to the direction of the wind. The area in which a nearby structure can have a significant influence on a source is limited to five times the lesser dimension (height or width) of that structure, or within 0.5 mile (0.8 km) of the source, whichever is less. The methods for determining GEP stack height for various building configurations have been described in USEPA's technical support document (USEPA, 1985).

Because the heights of exhaust stacks at the proposed project site are less than respective GEP stack heights, a voluntary air quality impact assessment was performed that demonstrates that the proposed equipment will not cause or contribute to a violation of the National Ambient Air Quality Standards.

3.1.4 Hazardous Air Pollutant Regulations

USEPA has developed National Emission Standards for Hazardous Air Pollutants (NESHAP) for numerous source categories. However, the proposed project will not involve categories proposed or promulgated as of the date of this application.

On December 15, 1996, the USEPA promulgated the final regulations implementing Section 112(g) of the Clean Air Act Amendments. This section addresses new and reconstructed major sources of hazardous air pollutants (HAPs). A primary requirement of this section is that those sources apply Maximum Achievable Control Technology (MACT) for control of HAPs. Section 112(g) is intended to address those sources for which USEPA has not yet established an intended source category-specific MACT standard. Instead, Section 112(g) may be applied as the "case-by-case" MACT standard. The regulations have excluded certain sources that are included in the proposed project. The USEPA has clarified that the electric generating unit regulations specifically includes the combustion turbines and their emissions (65FR 21363). Therefore, emissions from the combustion turbines are not included as regulated HAPs for the purpose of defining the applicability of Section 112(g).

The proposed project will not have the potential to emit regulated HAPs in quantities greater than or equal to 10 tons per year of any individual HAP or 25 tons per year of combined HAPs. Thus, the proposed project does not trigger the requirements of Section 112(g). See Section 2.5 for HAP emission estimates.

3.1.5 40 CFR Part 75 Continuous Emissions Monitoring Requirements

Affected utility units are required by 40 CFR Part 75 to continuously monitor emissions of SO_2 and NO_x. In addition, USEPA requires affected units to monitor emissions of carbon dioxide (CO_2) or oxygen (O_2) and opacity. The following is a summary of the monitoring requirements and options:

- An SO_2 continuous emission monitoring system and a flow monitoring system with an automated data acquisition and handling system shall be installed (40 CFR 75.10(a)(1)). According to 40 CFR 75.11(d)(2), gas fired and oil fired units

can follow the procedures outlined in Appendix D of 40 CFR 75 as an alternative to installing an SO_2 continuous emissions monitoring system. Invenergy Cannon Falls proposes to follow the SO_2 procedures specified in Appendix D;

- A NO_x continuous emission monitoring system (consisting of a NO_x pollutant concentration monitor and an O_2 or CO_2 diluent gas monitor) with an automated data acquisition and handling system shall be installed (40 CFR 75.10(a)(2)). If a unit can meet the definition of a peaking unit, it can be excluded from the requirement to install the continuous emission monitoring system. The proposed project may meet the definition of a peaking unit as per 40 CFR 72.2. A peaking unit is defined as a unit that has:
    1) An average capacity factor of no more than 10% during the previous three calendar years, and
    2) A capacity factor of no more than 20% in each of these calendar years.

This subpart also allows a source to use an alternative monitoring system (stipulated in subpart E) to a continuous emission monitoring system. Invenergy Cannon Falls anticipates the proposed facility will meet the definition of a peaking unit. Therefore, Invenergy Cannon Falls proposes to determine NO_x emissions by using an alternative monitoring system.

- For CO_2 or O_2, applicable units are allowed under 40 CFR 75 to use either a mass balance estimation methodology or a CEM. Invenergy Cannon Falls is proposing to use the mass balance estimation methodology;
- Install a continuous opacity monitoring system with the automated data acquisition and handling system (40 CFR 75.10(a)(4)). As stated in 40 CFR 75.14(c) and (d), natural gas fired units are exempt from the requirement to conduct opacity monitoring; and
- According to 40 CFR 75.10(c), the owner or operator shall determine and record the heat input to each affected unit for every hour when fuel is combusted following the procedures in Appendix F of 40 CFR Part 75.

3.1.6 Compliance Assurance Monitoring

The proposed equipment (simple cycle combustion turbines and water bath gas heater) will not be equipped with add-on air pollution control devices. Subsequently,

Compliance Assurance Monitoring (CAM) as specified in 40 CFR Part 64 will not be required for the proposed project.

3.1.7 Acid Rain Provisions

3.1.7.1 Part 72 Permits Regulation

All utility generating units greater than 25 MW are required to obtain a Phase II Acid Rain Permit. This permit is generally incorporated into a facility's Title V Operating permit and is issued by the state. In order to comply with the requirements of 40 CFR Part 72, the following course of action will be or has been taken by Invenergy Cannon Falls.

- The proposed project will obtain an ORIS code from the U.S. Department of Energy (DOE); and
- Invenergy Cannon Falls will send a letter to the USEPA and DOE and issue a public notice identifying a Designated Representative for the proposed project, as stipulated in 40 CFR 72.20 (Authorization and Responsibilities of the Designated Representative) and 72.24 (Certification).

A Phase II Acid Rain Permit will be submitted to the MPCA under separate cover in order to allow a permit to be issued prior to the start of operation of the proposed electric generating equipment.

3.1.7.2 Part 73 – Sulfur Dioxide Allowance System

Part 73 of the Acid Rain provisions establishes requirements related to a sulfur dioxide allowance system. This includes:

- The allocation of sulfur dioxide emission allowances;
- The tracking, holding, and transfer of allowances;
- The deduction of allowances for purposes of compliance; and
- Miscellaneous other requirements.

Invenergy Cannon Falls is aware of the requirements to secure an SO_2 allowance on an annual basis and will comply with the appropriate requirements.

3.1.8 Accidental Release Regulations

Federal accidental release prevention requirements are established in 40 CFR Part 68. These requirements cover risk management planning at facilities with more than a threshold quantity of a listed regulated substance in a single process. The rule lists 77 acutely toxic substances with threshold quantities ranging from 500 to 20,000 pounds, and also lists an additional 63 flammable gases and volatile liquids, each with a 10,000 pound threshold quantity. Invenergy Cannon Falls does not anticipate processing any chemicals at the proposed plant that would trigger applicability of the accidental release prevention requirements.

3.1.9 Title V Operating Permits

A source is required to file a Title V Operating Permit application if it is classified as a major stationary source. A major stationary source is defined as any source having the potential to emit greater than 100 tons per year of any criteria air pollutant. Lower thresholds are established for certain types of nonattainment areas. In addition, any source that has the potential to emit greater than 10 tons per year of a single HAP or 25 tons per year of combined HAPs would also be classified as a major source under the Title V program.

The proposed project will have potential emissions that exceed the applicability threshold levels for the Title V program, and thus a Title V Operating Permit application should be required for the proposed plant.

3.2 STATE REQUIREMENTS

Air quality regulations are also contained in the Minnesota rules and regulations. These are discussed below, along with any emission standards or limitations contained in these rules that may apply to the primary sources (simple cycle combustion turbines and water bath gas heater) associated with the proposed project.

3.2.1 Air Emission Fees (Minn. R. 7002.0005-7002.0085)

This rule identifies who pays fees, the types of fees, the amount of the fees, and how the fees are determined. New Facility Fees and Indirect Source Fees are fixed amounts and are listed in the rule.

3.2.2 Ambient Air Quality Standards – (Minn. R. 7009.0010-7009.0080)

This rule establishes the maximum allowable concentrations of pollutants that may exist in the air, averaged over a specified period of time.

3.2.3 Emission Standards for Visible Air Contaminants (Minn. R. 7011.0100-7011.0115)

This standard applies to any emission facility for which no other specific performance standard exists. A new emission facility cannot discharge into the atmosphere any gases displaying more than 20 percent opacity.

3.2.4 Preventing Particulate Matter from Becoming Air Borne (Minn. R. 7011.0150)

This rule states that no person shall cause or permit the handling, use, transportation or storage of any material in a way that may allow avoidable amounts of particulate matter to become airborne.

In addition, no person shall allow a building or its additions, a road, a driveway, or an open area to be constructed, used, repaired, or demolished without applying reasonable measures necessary to prevent particulate matter from becoming airborne.

3.2.5 Continuous Monitoring (Minn. R. 7017.1000)

The rule gives the MPCA Commissioner the authority to require facilities to install and conduct performance evaluations of continuous emissions monitoring systems (CEMS)

3.2.6 Performance Tests (Minn. R. 7017.2001-7017.2060)

The performance test rule must be followed when a facility conducts any air emission test. This rule describes notification, reporting, quality assurance and required operating conditions for performance testing.

3.2.7 Reports (Minn. R. 7019.2000)

The rule states than an owner or operator who is required to install a CEMS shall submit a written report of excess emissions for every calendar quarter.

3.2.8 Emission Inventory (Minn. R. 7019.3000-7019.3100)

The Emission Inventory rule state that any facility required to obtain a state or Part 70 operating permit and all facilities with the potential to emit 25 tons per year or more of

any criteria pollutant must submit annual inventories to the MPCA by April 1 of the year following the year being reviewed.

4.0 VOLUNTARY AMBIENT AIR QUALITY IMPACT ASSESSMENT

As stated in the Code of Federal Regulations (40 CFR 52) and Minnesota Rules, any application for a permit under the PSD provisions shall contain an analysis of ambient air quality in the area that the major project would affect. This requirement only applies to those air pollutants that would trigger PSD applicability.

The proposed plant does not trigger PSD applicability for any individual regulated criteria air pollutant. However, a voluntary air quality impact assessment was performed to determine the resultant impact on ambient air quality from the proposed Cannon Falls Energy Center. A detailed description of the modeling approach and data requirements for the air quality impact assessment is included in this section.

4.1 DESCRIPTION OF AIR QUALITY DISPERSION MODEL

The air quality modeling analyses employed USEPA's Industrial Source Complex (ISC-PRIME) model. Lakes Environmental's *ISC-AERMOD View* program was used to run this model. This program is also capable of running the USEPA's ISC3, AERMOD and AERMOD with deposition models. The *ISC-AERMOD View* program contains a windows-based version of the USEPA's ISC-Prime model.

The ISC-PRIME model (Version 01228) was used for this analysis. Major features of the ISC-PRIME model are as follows:

- Plume rise due to momentum and buoyancy as a function of downwind distance for stack emissions (Briggs, 1971 and 1975);
- The influence of building wakes on plume transport and dispersion is evaluated by the Huber and Snyder method (1976, 1977) for physical stack heights that are greater than $h_b + 0.5\ l_b$, where h_b is the building height and l_b is the lesser of the building height or width, and by the Schulman and Scire method (1980a, 1980b, 1985, 1986) for stack heights that are less than $h_b + 0.5\ l_b$;
- Terrain truncation algorithm;
- Regulatory default option;
- Calm wind treatment of NWS meteorological data;
- Buoyancy-induced plume rise algorithm;
- Procedures suggested by Briggs (1973) for evaluating stack-tip downwash;

- Consideration of the effects of gravitational settling and dry deposition on ambient particulate concentrations;
- Capability of simulating line, volume, and area sources;
- Concentration estimates for 1 hour to annual average;
- Use of COMPLEX I model algorithms to determine concentrations of receptors located in complex terrain (i.e., terrain height higher than plume height); and
- Capability of selecting the higher of the combined and complex terrain calculations on an hour-by-hour, source-by-source, and receptor-by-receptor basis for receptors in intermediate terrain (i.e., terrain between release height and plume height).

Details of the algorithms employed by ISC-PRIME may be found in the *User's Guide for ISC* (USEPA, 1995a) and in the *Addendum to ISC3 User's Guide, The Prime Plume Rise and Building Downwash Model* (Earth Tech, 1997). The regulatory default option was selected such that USEPA guideline requirements were met.

Emission sources at Invenergy Cannon Falls are influenced by aerodynamic downwash. Since downwash is a function of projected building width and height, it is necessary to account for the changes in building projection as they relate to changes in wind direction. Once these projected dimensions are determined, they can be used as input to the ISC3 model.

In October 1993, USEPA released the Building Profile Input Program (BPIP-PRIME) to determine wind direction – dependent building dimensions. The BPIP algorithms as described in the User's Guide (USEPA, 1993) have been incorporated into the commercially available *ISC-AERMOD View's BPIP View* program. The *BPIP View* program was used to determine the wind direction – dependent building dimensions for input to the ISC-PRIME model.

The BPIP-PRIME program builds a mathematical representation of each building to determine projected building dimensions and its potential zone of influence. These calculations are performed for 36 different wind directions (at 10-degree intervals). For example, the BPIP-PRIME building dimensions for a wind direction orientation of 30 degrees was used for wind directions between 26 and 35 degrees. If the BPIP-PRIME program determines that a source is under the influence of several potential building wakes, the structure or combination of structures which has the greatest influence (h_b + 1.5 l_b) is selected for input to the ISC-PRIME model. Conversely, if no building wake

effects are predicted to occur for a source for a particular wind direction, or if the worst-case building dimensions for that direction yield a wake region height less than the source's physical stack height, building parameters are set equal to zero for that wind direction. For this case, wake effect algorithms are not exercised when the model is run. The building wake criteria influence zone is 5 lb downwind, 2 lb upwind, and 0.5 lb crosswind. These criteria are based on recommendations by USEPA. The PRIME algorithm addresses the entire structure of the wake, from the cavity immediately downwind of the building, to the far wake. The input to the *BPIP View* preprocessing program consisted of Invenergy Cannon Falls exhaust stacks (two simple cycle systems, a gas heater, and a cooling tower) and building dimensions. Figure 4-1 illustrates the location of the emission sources in relation to building structures considered in the GEP stack height analysis.

4.2 DATA BASES FOR AIR QUALITY ASSESSMENT

The databases required for the air quality impact assessment included source emission data, meteorological data, and receptor points. The following sections describe the databases required to perform the air quality impact assessment.

4.2.1 Emission Inventory Data

The emission inventory of the proposed project included each of the two simple cycle systems exhaust stacks, the water bath gas heater and the fire water pump. The proposed simple cycle systems can operate at various loads. In order to identify a worst case dispersion scenario to utilize in all required dispersion modeling analyses for the simple cycle systems, a worst-case load evaluation was performed. This evaluation included reviewing the exhaust gas temperature and exhaust gas flow anticipated at various ambient temperatures and equipment operating loads. Table 4-1 presents the exhaust temperature and flow data over various operating conditions. As shown in this table, the lowest temperature and anticipated flow rate were selected to be used in the air quality impact assessment performed for emissions of PM_{10}, CO, SO_2 and NO_x. The selection of these rates will result in the worst case impacts on ambient air quality and reflect a hypothetical worst case condition.

Normal operation for the proposed project will consist of operation of the two simple cycle systems, the water bath gas heater and the fire water pump. The inventory used for modeling the ambient air quality impact of the proposed project is presented in Table 4-2.

TABLE 4-1
Load Analysis Parameters and Results - Combustion Turbines

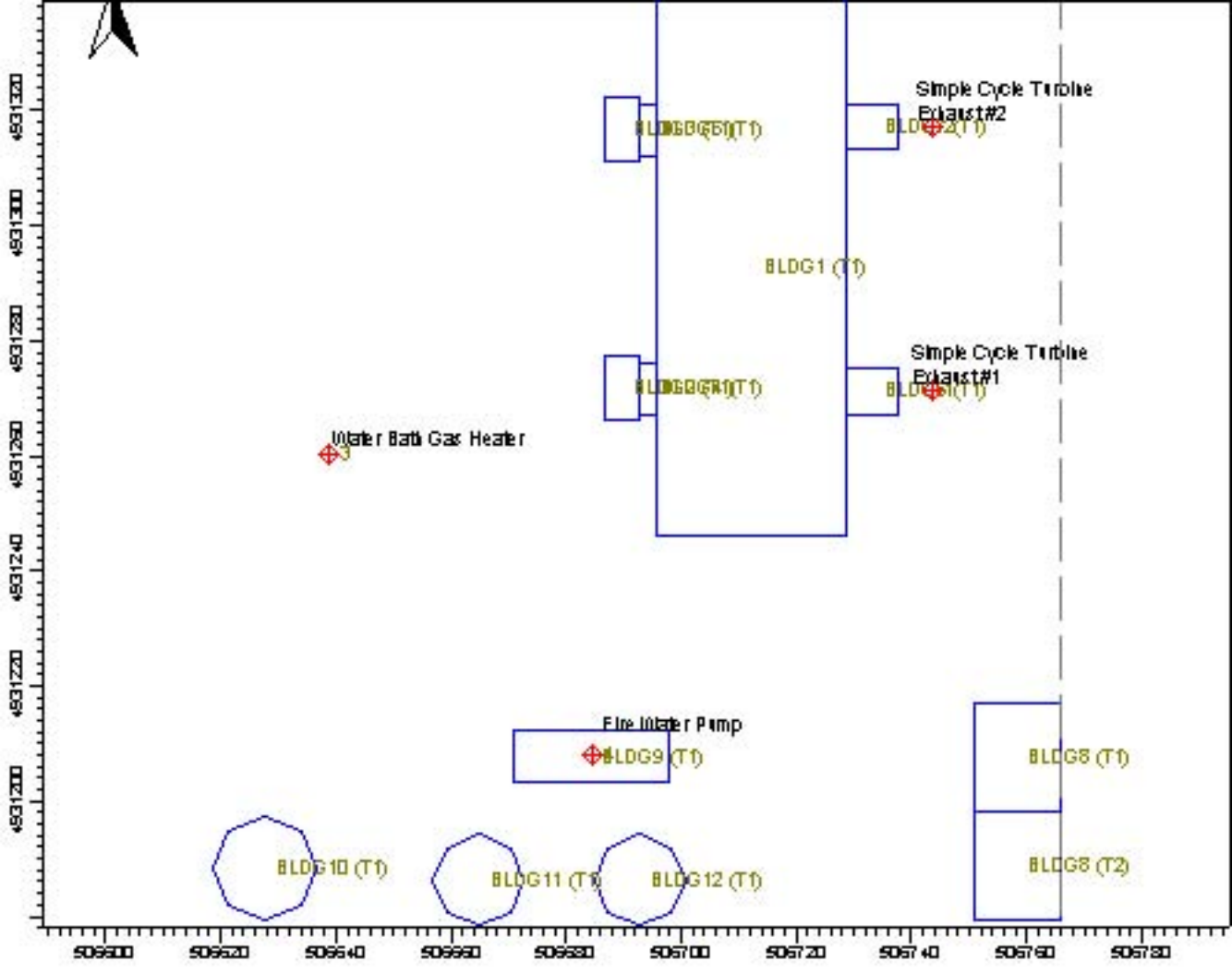
Natural Gas

Operating Condition	Case 1 Normal	Case 2 Normal	Case 3 Normal	Case 4 Power Augmentation	Case 5 Normal	Case 6 Normal	Case 7 Normal	Case 8 Power Augmentation	Case 9 Power Augmentation	Case 10 Normal	Case 11 Normal	Case 12 Normal
Ambient Temp (F)	-20	-20	-20	59	59	59	59	95	95	95	95	95
Turbine Load (%)	100	75	50	100	100	75	50	100	100	100	75	50
Stack Height (m) (75 ft)	22.86	22.86	22.86	22.86	22.86	22.86	22.86	22.86	22.86	22.86	22.86	22.86
Stack Diameter (m) (19 ft)	5.79	5.79	5.79	5.79	5.79	5.79	5.79	5.79	5.79	5.79	5.79	5.79
Exit Temperature (K)	830.3	866.4	896.4	869.2	872.5	896.4	922.0	870.9	882.0	892.5	913.1	922.0
Exit Velocity (m/s)	44.91	36.18	30.29	41.47	41.12	34.00	28.92	40.86	40.02	38.59	32.73	**27.77**
Exhaust Flow (acfm)	2,505,736	2,018,225	1,690,016	2,313,374	2,293,861	1,896,859	1,613,340	2,279,597	2,232,615	2,152,647	1,825,745	1,549,170
Exhaust Flow (lb/hr)	3,989,000	3,079,000	2,492,000	3,518,000	3,475,000	2,797,000	2,313,000	3,460,000	3,346,000	3,188,000	2,643,000	2,221,000
Exit Temperature (F)	1035	1100	1154	1105	1111	1154	1200	1108	1128	1147	1184	1200

Distillate Fuel Oil

Operating Condition	Case 1 Normal	Case 2 Normal	Case 3 Normal	Case 4 Normal	Case 5 Normal	Case 6 Normal	Case 7 Normal	Case 8 Normal	Case 9 Normal	Case 10 Normal	Case 11 Normal
Ambient Temp (F)	-20	-20	-20	59	59	59	59	95	95	95	95
Turbine Load (%)	100	75	50	100	100	75	50	100	100	75	50
Stack Height (m) (75 ft)	22.86	22.86	22.86	22.86	22.86	22.86	22.86	22.86	22.86	22.86	22.86
Stack Diameter (m) (19 ft)	5.79	5.79	5.79	5.79	5.79	5.79	5.79	5.79	5.79	5.79	5.79
Exit Temperature (K)	**817.0**	868.7	897.0	859.8	863.7	895.3	922.0	873.7	885.9	912.0	922.0
Exit Velocity (m/s)	46.14	36.66	30.54	42.82	42.52	35.03	29.53	41.28	39.91	33.68	28.53
Exhaust Flow (acfm)	2,574,280	2,045,087	1,703,956	2,389,055	2,372,420	1,954,114	1,647,518	2,302,730	2,226,374	1,878,719	1,591,718
Exhaust Flow (lb/hr)	4,165,000	3,112,000	2,511,000	3,673,000	3,631,000	2,885,000	2,362,000	3,484,000	3,322,000	2,723,000	2,282,000
Exit Temperature (F)	1011	1104	1155	1088	1095	1152	1200	1113	1135	1182	1200

Note: Information is for each combustion turbine.


Simple Cycle Turbine Exhaust#2
BLDG1 (T1)
Simple Cycle Turbine Exhaust#1
Water Bath Gas Heater
Fire Water Pump
BLDG9 (T1)
BLDG8 (T1)
BLDG8 (T2)
BLDG10 (T1)
BLDG11 (T1)
BLDG12 (T1)
4931320
4931300
4931280
4931260
4931240
4931220
4931200
509600
509620
509640
509660
509680
509700
509720
509740
509760
509780

4.2.2 Meteorological Data

The meteorological data used in the dispersion modeling analyses consisted of five years (1987-1991) of hourly surface observations from the National Weather Service (NWS) station located at the international airport in Minneapolis/St. Paul, Minnesota and coincident mixing heights from the Whitney Memorial Airport station in St. Cloud. This is the data set recommended by MPCA personnel for conducting an air quality impact assessment in this part of Minnesota. Surface observations consist of hourly measurements of wind direction, wind speed, and temperature, and estimates of ceiling height and cloud cover. The USEPA developed rural and urban interpolation methods to account for the effects of the surrounding area on development of the mixing layer boundary. The rural scheme was used to determine hourly mixing heights representative of the area in the vicinity of the proposed project.

4.2.3 Receptor Grid

The receptor grid for the ISC-PRIME dispersion model was designed to identify the maximum air quality impact due to the proposed project. The receptor grid consisted of 2,630 receptors extending to 5 km from the proposed project. Since the emission sources associated with the proposed project have stack heights less than GEP stack height, receptors were closely spaced (10 meters) along the project boundary to identify the influence of aerodynamic building downwash. The following receptor spacing was used as recommended by the MPCA Air Dispersion Modeling Guidance Table 5:

- Locations at 10 m spacing along the fence line of the proposed project;
- 25 m spacing from the proposed fence line to 300 m;
- 100 m spacing from 300 m out from the proposed project to 2 km; and
- 500 m spacing from 2 km to 5 km from the proposed project.

Receptor elevations were included for all receptor points and were obtained from digital elevation 7.5 minute topographic maps (www.webgis.com) and United States Geological topographic maps. The base elevation of the proposed project is 865 feet above sea level. The receptor grid is illustrated in Figure 4-2.

4.2.4 Background Concentrations

Background concentrations are typically added to maximum modeled predicted concentrations to demonstrate compliance with the NAAQS. The inclusion of these background concentrations is intended to represent the potential concentration that may

TABLE 4-2

EMISSION INVENTORY OF THE PROPOSED CANNON FALLS ENERGY CENTER'S EMISSION SOURCES
INVENERGY CANNON FALLS LLC

EMISSION SOURCES	ISC MODEL SOURCE NO.	UTM COORDINATES (km)		RELEASE HEIGHT (m)	EXIT GAS TEMPERATURE (K)[b]	EXIT GAS VELOCITY (m/s)[a]	STACK DIAMETER (m)	EMISSION RATE (g/s)[c]			
		EAST	NORTH					PM_{10}	NO_x	CO	SO_2
Simple Cycle Combustion Turbine - Unit #1	1	506.744	4931.271	22.86	817.0	27.77	5.79	4.28	3.49	9.20	10.08
Simple Cycle Combustion Turbine - Unit #2	2	506.744	4931.317	22.86	817.0	27.77	5.79	4.28	3.49	9.20	10.08
Water Bath Gas Heater	3	506.639	4931.260	4.57	541.5	6.89	0.20	0.0063	0.174	0.107	0.002
Fire Water Pump	4	506.685	4931.208	4.57	722.0	15.85	0.13	0.00504	0.0052	0.0202	0.0454

[a] Support Information:

The exit velocity used for the Simple Cycle Combustion Turbines reflects worst case exit velocity from the cases presented by the turbine vendor in the load analysis (Table 4-1).

[b] Support Information:

The exit gas temperature used for the Simple Cycle Combustion Turbines reflects worst case exit temperature from the cases presented by the turbine vendor in the load analysis (Table 4-1).

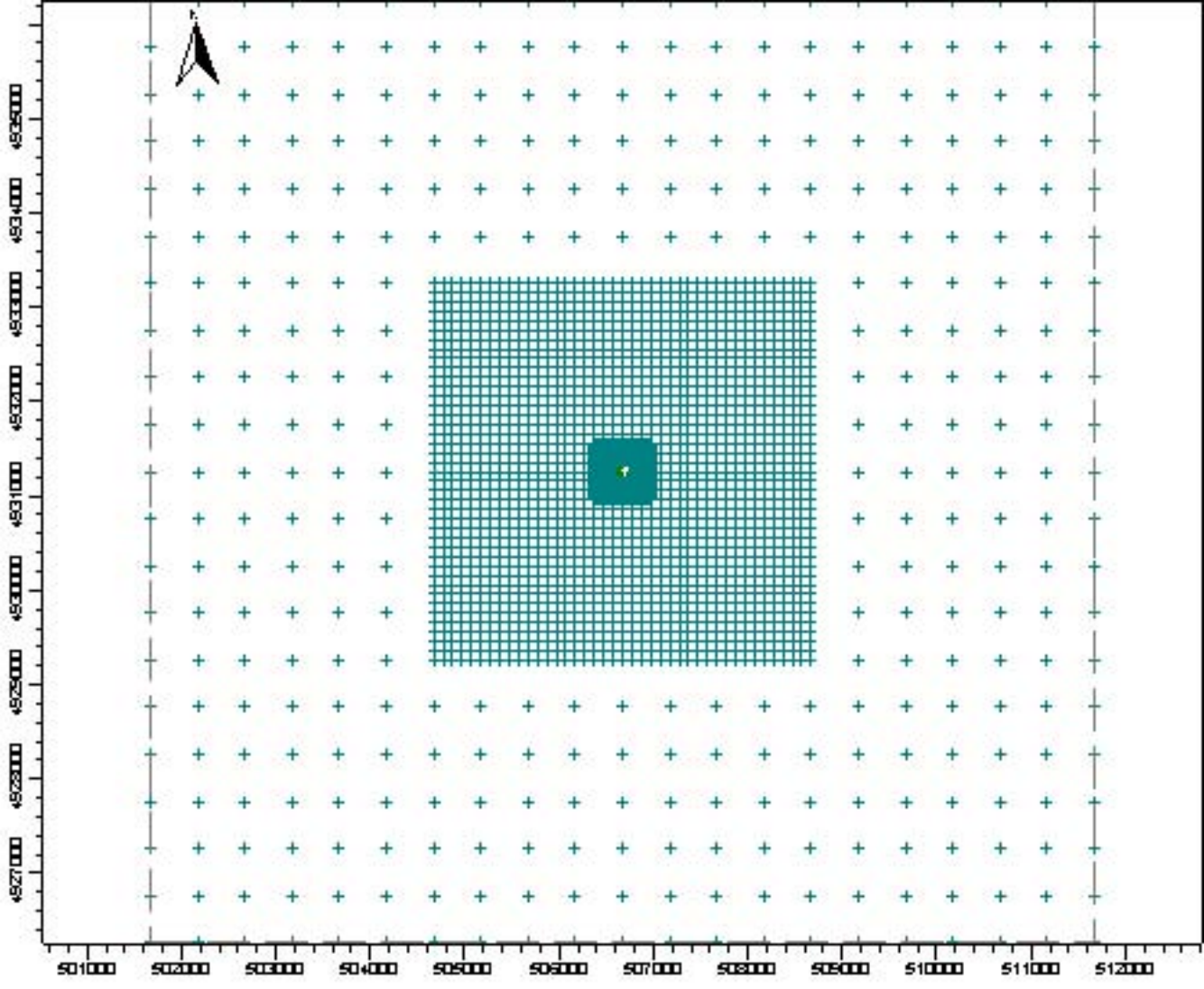
[c] Support Information:

PM_{10} - g/s emission rate based on 34 lbs/hr (turbine), 0.05 lbs/hr (gas heater), and 0.04 lbs/hr (fire water pump).

NO_x - g/s emission rate based on 27.67 lbs/hr (turbine), 1.38 lbs/hr (gas heater), and 0.041 lbs/hr (fire water pump).

CO - g/s emission rate based on 73 lbs/hr (turbine), 0.85 lbs/hr (gas heater), and 0.16 lbs/hr (fire water pump).

SO_2 - g/s emission rate based on 80 lbs/hr (turbine), 0.0156 lbs/hr (gas heater), and 0.36 lbs/hr (fire water pump).


N
4535000
4534000
4533000
4532000
4531000
4530000
4529000
4528000
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502000
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occur from other industrial sources not specifically included in the air quality modeling analyses. The background concentrations were obtained from the MPCA's Air Dispersion Modeling Guidance, Table 6 and are as follows:

Pollutant	Averaging Period	Concentration * (ug/m^3)
PM_{10}	Annual	23
	24-Hour	37
NO_x	Annual	17
SO_2	Annual	5
	3-Hour	128
	24-Hour	60

* Concentration represents MPCA determined background levels for "Rest of MN" for NO_x and PM_{10}.

As shown in the following sections, the resultant modeled concentration for the Cannon Falls Energy Center in combination with the representative background concentration will result in concentration levels well below the established NAAQS.

4.3 MODELING METHODOLOGY

4.3.1 SO_2 Modeling Demonstration

Emissions of SO_2 from the proposed Cannon Falls Energy Center were modeled using the representative databases described above. This analysis consisted of using the ISC-PRIME dispersion model in conjunction with 5-years of hourly meteorological data. Table 4-3 presents the maximum predicted annual average, 3-hour and 24-hour concentrations for the proposed project (under worst case operating conditions). As shown in this table, the proposed Cannon Falls Energy Center will not cause or contribute to an exceedance of the SO_2 NAAQS (annual, 3-hour and 24-hour).

4.3.2 PM/PM_{10} Modeling Demonstration

Emissions of PM/PM_{10} from the proposed Cannon Falls Energy Center were modeled using the representative databases described above. This analysis consisted of using the ISC-PRIME dispersion model in conjunction with 5-years of hourly meteorological data. Table 4-4 presents the maximum predicted annual average and 24-hour concentrations for the proposed project (under worst case operating conditions). As shown in this table,

TABLE 4-3
SUMMARY OF MAXIMUM PREDICTED SO_2 CONCENTRATIONS DUE TO THE PROPOSED PROJECT
INVENERGY CANNON FALLS LLC

AVERAGING PERIOD	DATA PERIOD			RECEPTOR LOCATION (KM)		MAXIMUM PREDICTED CONCENTRATION (ug/m^3)	BACKGROUND CONCENTRATION (ug/m3)	TOTAL CONCENTRATION (ug/m3)	NAAQS (ug/m^3)
	YEAR	DAY	HOUR ENDING	EAST	NORTH				
ANNUAL	1987	-	-	506716.25	4931146.00	2.24	5	7.24	80
	1988	-	-	506804.00	4931261.50	2.75	5	7.75	
	1989	-	-	506804.00	4931261.50	2.48	5	7.48	
	1990	-	-	506804.00	4931261.50	2.44	5	7.44	
	1991	-	-	506804.00	4931261.50	2.16	5	7.16	
24-HOUR HIGHEST, 2nd HIGHEST	1987	16-Jul	-	506696.75	4931367.00	38.5	60	98.5	365
	1988	7-May	-	506684.00	4931371.00	58.0	60	118.0	
	1989	20-Jun	-	506677.25	4931367.00	29.6	60	89.6	
	1990	20-Nov	-	506677.25	4931367.00	23.3	60	83.3	
	1991	29-Sep	-	506667.50	4931367.00	28.0	60	88.0	
3-HOUR HIGHEST, 2nd HIGHEST	1987	19-Apr	15	506667.50	4931367.00	171.9	128	299.9	1300
	1988	8-Apr	15	506684.00	4931371.00	167.5	128	295.5	
	1989	20-Jun	15	506677.25	4931367.00	69.7	128	197.7	
	1990	19-Oct	15	506684.00	4931371.00	66.0	128	194.0	
	1991	11-Mar	15	506667.50	4931367.00	92.6	128	220.6	

TABLE 4-4
SUMMARY OF MAXIMUM PREDICTED PM/PM_{10} CONCENTRATIONS DUE TO THE PROPOSED PROJECT
INVENERGY CANNON FALLS LLC

AVERAGING PERIOD	DATA PERIOD			RECEPTOR LOCATION (M)		MAXIMUM PREDICTED CONCENTRATION (ug/m^3)	BACKGROUND CONCENTRATION (ug/m3)	TOTAL CONCENTRATION (ug/m3)	NAAQS (ug/m^3)
	YEAR	DAY	HOUR ENDING	EAST	NORTH				
ANNUAL	1987	-	-	506804.00	4931261.50	0.79	23.0	23.79	50
	1988	-	-	506804.00	4931261.50	0.98	23.0	23.98	
	1989	-	-	506804.00	4931261.50	0.88	23.0	23.88	
	1990	-	-	506804.00	4931261.50	0.87	23.0	23.87	
	1991	-	-	506804.00	4931261.50	0.78	23.0	23.78	
24-HOUR HIGHEST, 2nd HIGHEST	1987	16-Jul	-	506696.75	4931367.00	16.2	37.0	53.2	150
	1988	7-May	-	506684.00	4931371.00	24.0	37.0	61.0	
	1989	5-May	-	506804.00	4931251.50	12.5	37.0	49.5	
	1990	12-Jan	-	506804.00	4931251.50	9.9	37.0	46.9	
	1991	29-Sep	-	506667.50	4931367.00	11.9	37.0	48.9	

the proposed Cannon Falls Energy Center will not cause or contribute to an exceedance of either the PM/PM_{10} annual or 24-hour NAAQS.

4.3.3 CO Modeling Demonstration

Emissions of CO from the proposed Cannon Falls Energy Center were modeled using the representative databases described above. This analysis consisted of using the ISC-PRIME dispersion model in conjunction with 5-years of hourly meteorological data. Table 4-5 presents the maximum predicted 1-hour and 8-hour average concentrations for the proposed project (under worst case operating conditions). As shown in this table, the proposed Cannon Falls Energy Center will not cause or contribute to an exceedance of either the CO 1-hour or 8-hour NAAQS.

4.3.4 NO_x Modeling Demonstration

Emissions of NO_x from the proposed Cannon Falls Energy Center were modeled using the representative databases described above. This analysis consisted of using the ISC-PRIME dispersion model in conjunction with 5-years of hourly meteorological data. Table 4-6 presents the maximum predicted annual average concentrations for the proposed project (under worst case operating conditions). As shown in this table, the proposed Cannon Falls Energy Center will not cause or contribute to an exceedance of the NO_2 annual average NAAQS.

The modeling files for all the pollutants can be found in Appendix D.

4.4 OZONE MODELING DEMONSTRATION

Since the proposed plant will result in a VOC emission rate of only 12.1 tons per year, an air quality impact assessment was not performed. As stated by USEPA in the "Guidelines on Air Quality Models", simulation of ozone formation and transport is a highly complex and resource intensive exercise. Because of the complexity, the PSD program only requires a demonstration to be performed for a proposed source that will have potential VOC emissions in excess of 100 tons per year.

TABLE 4-5
SUMMARY OF MAXIMUM PREDICTED CO CONCENTRATIONS DUE TO THE PROPOSED PROJECT
INVENERGY CANNON FALLS LLC

AVERAGING PERIOD	DATA PERIOD			RECEPTOR LOCATION (KM)		MAXIMUM PREDICTED CONCENTRATION (ug/m^3)	NAAQS (ug/m^3)
	YEAR	DAY	HOUR ENDING	EAST	NORTH		
1-HOUR HIGHEST, 2ND HIGHEST	1987	19-Apr	12	506684.00	4931371.00	222.9	40,000
	1988	7-May	13	506677.25	4931367.00	217.0	
	1989	28-Jun	17	506570.00	4931242.00	134.0	
	1990	27-Aug	13	506570.00	4931251.50	135.4	
	1991	13-Oct	12	506687.00	4931367.00	143.6	
8-HOUR HIGHEST, 2ND HIGHEST	1987	27-Aug	8	506609.00	4931146.00	61.5	10,000
	1988	7-May	16	506687.00	4931367.00	78.5	
	1989	30-Jun	24	506559.00	4931246.00	54.7	
	1990	5-Mar	24	506570.00	4931251.50	72.5	
	1991	10-Jul	16	506570.00	4931251.50	62.5	

TABLE 4-6
SUMMARY OF MAXIMUM PREDICTED NO_2 CONCENTRATIONS DUE TO THE PROPOSED PROJECT
INVENERGY CANNON FALLS LLC

AVERAGING PERIOD	DATA PERIOD			RECEPTOR LOCATION (KM)		MAXIMUM PREDICTED CONCENTRATION (ug/m^3)	BACKGROUND CONCENTRATION (ug/m3)	TOTAL CONCENTRATION (ug/m3)	NAAQS (ug/m^3)
	YEAR	DAY	HOUR ENDING	EAST	NORTH				
ANNUAL	1987	-	-	506570.0	4931280.5	6.03	17.0	23.03	100
	1988	-	-	506706.5	4931146.0	4.81	17.0	21.81	
	1989	-	-	506570.0	4931299.5	4.88	17.0	21.88	
	1990	-	-	506570.0	4931309.5	4.06	17.0	21.06	
	1991	-	-	506570.0	4931280.5	5.65	17.0	22.65	

4.5 AIR EMISSIONS RISK ANALYSIS (AERA)

The MPCA requires an Air Emission Risk Analysis (AERA) for facilities subject to the Environmental Assessment Worksheet (EAW) or Environmental Impact Statement (EIS) processes if the source is one of the mandatory categories in Minn. R. 4410.4300, subpart 15. (A). or Minn.R. 4410.4400 and air emissions are expected to be greater than 100 tons per year of any one criteria pollutant after the use of control equipment. Also, proposed electric facilities greater than or equal to 25 MW are subject to AERA. Based on these requirements, the Cannon Falls Energy Center may be subject to AERA, but only for the combustion turbines when burning backup distillate fuel oil. Appendix C contains the AERA report for this project. Based on the report, the pollutants associated with the firing of distillate fuel oil in the turbines do not appear to pose unacceptable risks or hazards to the public as a result of their emissions.

5.0 PROPOSED PERMIT TERMS AND CONDITIONS

Invenergy Cannon Falls requests that the following terms and conditions be included in the permit to construct and operate for the proposed project:

1. Air pollutant emission rates for the Cannon Falls Energy Center will be limited to the following amounts:

    - Nitrogen Dioxide (NO_x): 248.6 tons/year
    - Carbon Monoxide (CO): 144.8 tons/year
    - Particulate Matter (PM_{10}): 74.8 tons/year
    - Sulfur Dioxide (SO_2): 57.3 tons/year
    - Volatile Organic Compounds (VOC): 12.1 tons/year

    These emission rates are based on a 12-month rolling average. The equipment associated with the Cannon Falls Energy Center will also have the potential to emit insignificant levels of hazardous air pollutants (Section 112b of the Clean Air Act), and sulfuric acid mist, beryllium and lead. Since these emission rates are insignificant, no specific emission limitations have been established.

2. To demonstrate compliance with the emission limitations contained within Condition #1, Invenergy Cannon Falls will maintain records on the quantity of fuel combusted (natural gas and distillate fuel oil) in each piece of equipment on a daily basis. Emission estimates will be calculated monthly based on the quantity of fuel combusted, operating condition of the turbine and predefined emission factors. Compliance with the limitation defined in Condition #1 will be based on a 12 month rolling average. Predefined emission factors will be established based on initial compliance demonstrations (i.e., stack testing and engineering estimates);

3. The proposed simple cycle combustion turbines shall be limited to:

	NO_x	CO	VOC	SO_2	PM_{10}
Natural Gas	12 ppmvd @ 15% O_2 (3-hour average)*	15 ppmvd (3-hour average)**	1.4 ppmvw (3-hour average)	0.8 grains/scf	18 lbs/hr
Distillate Fuel Oil	42 ppmvd @ 15% O_2 (3-hour average)	20 ppmvd (3-hour average)	3.5 ppmvw (3-hour average)	0.05% by weight	34 lbs/hour

* With power augmentation. Without power augmentation the limit shall be 9 ppmvd @ 15% O_2 (3-hour average).

** With power augmentation. Without power augmentation the limit shall be 9 ppmvd (3-hour average).

4. Compliance with the limitations contained in condition #3 shall be determined through stack testing. This stack testing must be performed within 90 days of commercial operation (as defined under the Acid Rain Program) of one of the simple cycle combustion turbines. Stack testing must be performed at 100% operating load for emissions of NO_x, CO, VOC and PM_{10} and reflect power augmentation conditions. These emission limitations shall not apply during periods of startup, shutdown or malfunction conditions. Compliance with the SO_2 fuel content limitation will be based on vendor supplied fuel sulfur content certificates.

Once initial compliance has been demonstrated, future compliance will be achieved by recording the fuel combusted and demonstrating compliance with the annual air pollutant emission rate limitations.

APPENDIX A

MPCA AIR PERMIT APPLICATION FORMS

MINNESOTA POLLUTION CONTROL AGENCY
AIR QUALITY
520 LAFAYETTE ROAD
ST. PAUL, MN 55155-4194

PERMIT APPLICATION FORM **CR-01**
CERTIFICATION
8/4/98

1) AQ Facility ID No.: _____

2) Facility Name: Cannon Falls Energy Center

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.

I also certify, in accordance with Minnesota Rules 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, including those that will become applicable during the term of the permit.

Owner:		**Operator:**	
Mr./Ms.	Bryan Schueler	Mr./Ms.	Bryan Schueler
Title:	Vice President	Title:	Vice President
Signature:	Bryan Schueler	Signature:	Bryan Schueler
Date:	08/26/04	Date:	08/26/04

MINNESOTA POLLUTION CONTROL AGENCY
AIR QUALITY
520 LAFAYETTE ROAD
ST. PAUL, MN 55155-4194

PERMIT APPLICATION FORM **CP-01**

TOTAL FACILITY OPERATING PERMIT COVER PAGE

8/5/98

1a) AQ Facility ID No.: _____

1b) AQ File No.: _____

2) Facility Name: Cannon Falls Energy Center

THIS TOTAL FACILITY OPERATING PERMIT APPLICATION IS FOR: (check all that apply)

- ☒ A Part 70 permit (Minn. Rules pt. 7007.0200)
- ☐ A State permit (Minn. Rules pt. 7007.0250)
- ☐ One of the 28 Source Categories listed in form GI-09C item 1 (Minn. Rules pt. 7007.0200)
- ☒ Construction of a New Facility (Minn. Rules pt. 7007.0150, subp. 1)

CONFIDENTIALITY:

- ☐ This application contains material which is claimed to be confidential under Minnesota Statutes Chapter 13 and Section 116.075 and Minn. Rules pt. 7000.1300.

MINNESOTA POLLUTION CONTROL
AGENCY
AIR QUALITY
520 LAFAYETTE ROAD
ST. PAUL, MN 55155-4194

PERMIT APPLICATION FORM **GI-01**

FACILITY INFORMATION

March 25, 2003

1a) AQ Facility ID No.:

1b) AQ File No.:

2) Facility Name: Cannon Falls Energy Center

3) Facility Location:

Street Address: The property is not platted. The address is forthcoming.

City: Cannon Falls State: MN ZIP Code: 55009 County: Goodhue

Mailing Address: 233 South Wacker Drive, Suite 9450

City: Chicago State: IL ZIP Code: 60606

4) Corporate/Company Owner:

Name: Invenergy Cannon Falls LLC

Mailing Address: 233 South Wacker Drive, suite 9450

City: Chicago State: IL ZIP Code: 60606

Owner Classification: ☒ Private ☐ Local Govt ☐ State Govt. ☐ Federal Govt. ☐ Utility

5) Corporate/Company Operator (if different than owner):

Name: Same

Mailing Address:

City: State: ZIP Code:

6) Co-permittee (if applicable):

Name: N/A

Mailing Address:

City: State: ZIP Code:

7) Legally responsible official for this permit/facility:

Mr/Ms: Mr. Bryan Schueler Phone: (312) 224-1421

Title: Vice President Fax: (312) 707-9045

At (check one): ☒ Owner Address ☐ Operator Address ☐ Emission Facility Address

☐ Other address (specify)

8) Contact person for this permit:

Mr/Ms: Joel Schroeder Phone: (312) 224-1417

Title: Project Manager Fax: (312) 707-9045

At (check one): ☒ Owner Address ☐ Operator Address ☐ Emission Facility Address

☐ Other address (specify)

E-mail address: jschroeder@invenergyllc.com

9) All billings for annual fees should be addressed to:

Mr/Ms: Mr. Bryan Schueler Phone: (312) 224-1421

Title: Vice President Fax: (312) 707-9045

At (check one): ☒ Owner Address ☐ Operator Address ☐ Emission Facility Address

☐ Other (specify) _____

10) Standard Industrial Classification (SIC) Code and description for the facility:

Primary: 4911 / _____

Secondary (if applicable): _____ / _____

Tertiary (if applicable): _____ / _____

11) Primary product produced (or activity performed) at the facility is:

Electric Power

12) Facility is: ☒ Stationary ☐ Portable

13) Check the one that applies best to your facility:

☒ New facility planned or under construction (first permit application)

☐ Existing facility, applying for renewal of a total facility Air Quality operating permit issued by the MPCA

☐ Existing facility, and have never had a total facility operating permit, but have had another type of Air Quality permit issued by the MPCA

☐ Existing facility, but have never had a total facility operating permit or any other type of Air Quality permit issued by the MPCA

14) (Reserved for future use)

15) Is environmental review required (either an Environmental Assessment Worksheet (EAW) or an Environmental Impact Statement (EIS)) for this facility? Call the Minnesota Environmental Quality Board for more information (1-800-657-3794, or 296-8253 in the Twin Cities metro area).

☒ Yes ☐ No

Note: If you answered "Yes" to this question, you may also be required to perform a state air toxics review for your facility. Please call (800) 646-6247 or (651) 297-2274.

16) Are you required to submit a Toxics Release Inventory (Form R) under SARA Title 313 for this facility? Call the Minnesota Department of Public Safety, Emergency Response Commission for more information (651-297-7372).

☐ Yes ☒ No

17) Is this facility within 50 miles of another state or the Canadian border:

☒ Yes (specify which ones) WI ☐ No

18) Brief description of the facility or proposed facility to be permitted (attach additional sheet if necessary):

Electric power generating plant

19) Are you proposing any alternative operating or emissions trading scenarios in this application (see Minn. R. 7007.0800, subp. 10 and 11)?

☐ Yes ☒ No

If yes, attach a description of your proposal, including a statement on how the proposal will meet all applicable requirements (in particular, please address federal New Source Review requirements, if applicable). See Form GI-09(C).

20) Person preparing this permit application:

Mr. / Ms. Steven Frey URS Corporation

Title: Senior Air Quality Manager E-mail address: steve_frey@urscorp.com

Phone: (847)228-0707 Fax: (847)225-1115 Date: August 26, 2004

MINNESOTA POLLUTION CONTROL AGENCY
AIR QUALITY
520 LAFAYETTE ROAD
ST. PAUL, MN 55155-4194

PERMIT APPLICATION FORM **GI-02**

PROCESS FLOW DIAGRAM

5/13/98

1) AQ Facility ID No.:

2) Facility Name: **Cannon Falls Energy Center – See Figure 2-8**

3) Flow Diagram:

MINNESOTA POLLUTION CONTROL AGENCY
AIR QUALITY
520 LAFAYETTE ROAD
ST. PAUL, MN 55155-4194

PERMIT APPLICATION FORM **GI-03**

FACILITY AND STACK/VENT DIAGRAM

5/26/98

1) AQ Facility ID No.:

2) Facility Name: **Cannon Falls Energy Center – See Figures 2-7 and 4-1.**

3) Facility and Stack/Vent Diagram:

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520 LAFAYETTE ROAD
ST. PAUL, MN 55155-4194

PERMIT APPLICATION FORM **GI-04**

STACK/VENT INFORMATION

5/26/98

1) AQ Facility ID No.: _____ **2)** Facility Name: **Cannon Falls Energy Center**

3a) SV ID No.	**3b)** Operator's Description	**3c)** Height of Opening From Ground (ft.)	**3d)** Inside Diameter in ft. (left column only) or Length x Width in ft. (both columns)		**3e)** Design Flow Rate at Exit (acfm)	**3f)** Exit Gas Temperature (° F)	**3g)** Rate/Temp Information Source	**3h)** Discharge Direction
001	Simple Cycle Turbine #1	75	19		1,549,170*	1,011*	M	U
002	Simple Cycle Turbine #2	75	19		1,549,170*	1,011*	M	U
003	Water Bath Gas Heater	15	0.67		475	515	M	U
004	Fire Water Pump	15	0.42		425	840	M	U
	*Worst case (lowest values provided by the turbine vendor) temperature and flow rate - used in the dispersion modeling analyses.							

MINNESOTA POLLUTION CONTROL AGENCY
AIR QUALITY
520 LAFAYETTE ROAD
ST. PAUL, MN 55155-4194

PERMIT APPLICATION FORM **GI-05A**
POLLUTION CONTROL EQUIPMENT INFORMATION
10/06/03

1) AQ Facility ID No.: _____ **2)** Facility Name: Cannon Falls Energy Center

3a) Control Equip ID No.	**3b)** CE Type Code	**3c)** Description	**3d)** Manufacturer	**3e)** Model No.	**3f)** Pollutants Controlled	**3g)** Capture Efficiency	**3h)** Destruct/ Collect Efficiency	**3i)** Afterburner Combustion Parameters
001	205	Low NOx Burner-Natural Gas	General Electric	Frame 7FA	NOx	NA	NA	NA
002	205	Low NOx Burner-Natural Gas	General Electric	Frame 7FA	NOx	NA	NA	NA
001	028	Water Injection-Fuel Oil	General Electric	Frame 7FA	NOx	NA	NA	NA
002	028	Water Injection-Fuel Oil	General Electric	Frame 7FA	NOx	NA	NA	NA

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520 LAFAYETTE ROAD
ST. PAUL, MN 55155-4194

PERMIT APPLICATION FORM **GI-05B**

EMISSION UNIT INFORMATION, PART 1

5/26/98

1) AQ Facility ID No.: _____ **2)** Facility Name: Cannon Falls Energy Center

3a) Emis Unit ID No.	3b) SV ID No(s).	3c) Relation Type	3d) Control Equip ID No.	3e) Emission Unit Operator's Description	3f) Manufacturer	3g) Model No.
001	1	(M)ain	001	Simple Cycle Turbine #1	General Electric	Frame 7FA
002	2	(M)ain	002	Simple Cycle Turbine #2	General Electric	Frame 7FA
003	3	(M)ain	NA	Water Bath Gas Heater	TBD	TBD
004	4	(M)ain	NA	Fire Water Pump	TBD	TBD

MINNESOTA POLLUTION CONTROL AGENCY
AIR QUALITY
520 LAFAYETTE ROAD
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PERMIT APPLICATION FORM **GI-05B**

EMISSION UNIT INFORMATION, PART 2

1) AQ Facility ID No.: _____ **2)** Facility Name: Cannon Falls Energy Center

3a) Emis Unit ID No.	**3h)** Maximum Design Capacity	**3i)** Maximum Design Capacity Units	**3j)** Maximum Fuel Input (MMBTU)	**3k)** Commence Construction Date (MM/DD/YY)	**3l)** Initial Startup Date (MM/DD/YY)	**3m)** Firing Method (coal-burning units only)	**3n)** % Fuel for Space Heat (boilers only)	**3o)** Bottle-neck? F = facility G = group of sources	**3p)** SIC Code
001	NA	NA	1,757.2*	TBD	TBD				2911
002	NA	NA	1,757.2*	TBD	TBD				2911
003	NA	NA	9.0	TBD	TBD				2911
004	NA	NA	290 HP	TBD	TBD				2911
	*Heat input at -20F while firing natural gas.								

MINNESOTA POLLUTION CONTROL AGENCY
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PERMIT APPLICATION FORM **GI-05C**

TANK INFORMATION

5/26/98

1) AQ Facility ID No.: _____ **2)** Facility Name: **Cannon Falls Energy Center**

3a) Tank ID No.	**3b)** Control Equip ID No.	**3c)** Product(s) Stored	**3d)** Interior Height (ft.)	**3e)** Interior Diameter (ft.)	**3f)** Capacity (1000 gals.)	**3g)** Construc-tion Type	**3h)** Support Type (floating roof only)	**3i)** Number of Columns (column-supported only)	**3j)** Column Diameter (column-supported only, in ft.)	**3k)** Deck Type (floating roof only)	**3l)** Seal Type (floating roof only)	**3m)** Date Installed or Constructed
001	NA	Distillate Fuel Oil CAS# 68476-34-6	30	65.2	750	5. Fixed r						2005
002	NA	Demineralized Water	30	65.2	750	5. Fixed r						2005
003	NA	Raw Water Tank	30	65.2	750	5. Fixed r						2005

MINNESOTA POLLUTION CONTROL AGENCY
AIR QUALITY
520 LAFAYETTE ROAD
ST. PAUL, MN 55155-4194

PERMIT APPLICATION FORM **GI-07**

FACILITY EMISSIONS SUMMARY

5/26/98

1) AQ Facility ID No.: _____ **2)** Facility Name: Cannon Falls Energy Center. See Table 2-2, Table 2-3, and Table 2-4 for emission calculations.

3a) Emission Source Type	**3b)** Emission Source ID No.	**3c)** CAS#:				CAS#:				CAS#:			
		3d) Pollutant Name: CO				Pollutant Name: NOx				Pollutant Name: PM/PM10			
		3e) Potential			**3f)** Actual	Potential			Actual	Potential			Actual
		Lbs per Hr	Unc tpy	Lim tpy	Tons per yr	Lbs per Hr	Unc tpy	Lim tpy	Tons per yr	Lbs per Hr	Unc tpy	Lim tpy	Tons per yr
SV	001	73	70.5	70.5	NA	352	121.2	121.2	NA	34	37.3	37.3	NA
SV	002	73	70.5	70.5	NA	352	121.2	121.2	NA	34	37.3	37.3	NA
SV	003	0.85	3.723	3.723	NA	1.38	6.044	6.044	NA	0.05	0.219	0.219	NA
SV	004	0.16	0.01	0.01	NA	3.64	0.18	0.18	NA	0.04	0.002	0.002	NA

4) Total Facility	Potential			Actual	Potential			Actual	Potential			Actual
		Unc	Lim	Yr		Unc	Lim	Yr		Unc	Lim	Yr
		144.8	144.8	NA		248.6	248.6	NA		74.8	74.8	NA

MINNESOTA POLLUTION CONTROL AGENCY
AIR QUALITY
520 LAFAYETTE ROAD
ST. PAUL, MN 55155-4194

PERMIT APPLICATION FORM **GI-07**

FACILITY EMISSIONS SUMMARY

5/26/98

1) AQ Facility ID No.: _____ **2)** Facility Name: Cannon Falls Energy Center. See Table 2-2, Table 2-3, and Table 2-4 for emission calculations.

3a) Emission Source Type	**3b)** Emission Source ID No.	**3c)** CAS#:				CAS#:				CAS#:			
		3d) Pollutant Name: SO2				Pollutant Name: VOC				Pollutant Name: H2SO4			
		3e) Potential			**3f)** Actual	Potential			Actual	Potential			Actual
		Lbs per Hr	Unc tpy	Lim tpy	Tons per yr	Lbs per Hr	Unc tpy	Lim tpy	Tons per yr	Lbs per Hr	Unc tpy	Lim tpy	Tons per yr
SV	001	80	28.6	28.6	NA	8.5	5.9	5.9	NA	10.6	3.8	3.8	NA
SV	002	80	28.6	28.6	NA	8.5	5.9	5.9	NA	10.6	3.8	3.8	NA
SV	003	0.0156	0.068	0.068	NA	0.05	0.219	0.219	NA	NA	NA	NA	NA
SV	004	0.36	0.02	0.02	NA	0.05	0.003	0.003	NA	NA	NA	NA	NA

4) Total Facility	Potential			Actual	Potential			Actual	Potential			Actual
		Unc	Lim	Yr		Unc	Lim	Yr		Unc	Lim	Yr
		57.3	57.3	NA		12.1	12.1	NA		7.6	7.6	NA

MINNESOTA POLLUTION CONTROL AGENCY
AIR QUALITY
520 LAFAYETTE ROAD
ST. PAUL, MN 55155-4194

PERMIT APPLICATION FORM **GI-07**

FACILITY EMISSIONS SUMMARY

5/26/98

1) AQ Facility ID No.: _____ **2)** Facility Name: Cannon Falls Energy Center. See Table 2-6, Table 2-7, and Table 2-8 for HAP emission summary and HAP calculations.

3a) Emission Source Type	**3b)** Emission Source ID No.	**3c)** CAS#:				CAS#:				CAS#:			
		3d) Pollutant Name:				Pollutant Name:				Pollutant Name:			
		3e) Potential			**3f)** Actual	Potential			Actual	Potential			Actual
		Lbs per Hr	Unc tpy	Lim tpy	Tons per yr	Lbs per Hr	Unc tpy	Lim tpy	Tons per yr	Lbs per Hr	Unc tpy	Lim tpy	Tons per yr

4) Total Facility	Potential			Actual	Potential			Actual	Potential			Actual
		Unc	Lim	Yr		Unc	Lim	Yr		Unc	Lim	Yr

MINNESOTA POLLUTION CONTROL AGENCY
AIR QUALITY
520 LAFAYETTE ROAD
ST. PAUL, MN 55155-4194

PERMIT APPLICATION FORM **GI-09**
REQUIREMENTS FORM
11/30/99

Federal and State Requirements

This packet of forms, **GI-09 REQUIREMENTS**, will help you to determine the federal and state requirements with which your facility must comply. Be advised that you must include any applicable requirement that may not be addressed in this part of the application.

The first section of this form asks questions to find out if your facility is subject to specific federal and state regulations. To assist you in filling out this form, there are nine attachments, forms **GI-09A** through **GI-09I**. This form will direct you to each of the attachments as necessary, which will help you determine if your facility is subject to these regulations. When you are directed to an attachment, complete it as required, but *always* return to this **GI-09 REQUIREMENTS** form.

1) National Emission Standards for Hazardous Air Pollutants for Source Categories
(NESHAP for Source Categories, 40 CFR pt. 63)

1a) To determine if any requirements for the National Emission Standards for Hazardous Air Pollutants (NESHAPS) for Source Categories (40 CFR pt. 63) apply to your facility, you must complete attached form **GI-09A REQUIREMENTS: NESHAP FOR SOURCE CATEGORIES** (40 CFR pt. 63).

1b) After completing form GI-09A, check one of the following boxes:
☐ YES, my facility **is currently** subject to NESHAP for Source Categories requirements.
☒ NO, my facility **is not currently** subject to NESHAP for Source Categories requirements.

1c) After completing form GI-09A, check one of the following boxes:
☐ YES, my facility **is** subject to requirements of case-by-case MACT under Section 112(g)(2)(B).
☒ NO, my facility **is not** subject to requirements of case-by-case MACT under Section 112(g)(2)(B).

2) National Emission Standards for Hazardous Air Pollutants
(NESHAP; 40 CFR pt. 61)

2a) To determine if any of the National Emission Standards for Hazardous Air Pollutants (NESHAP) (40 CFR pt. 61) apply to your facility, you must complete the attached form **GI-09B REQUIREMENTS: NESHAP** (40 CFR pt. 61).

2b) After completing item 2a, check one of the following boxes:
☐ YES, my facility **is** subject to NESHAP requirements.
☒ NO, my facility **is not** subject to NESHAP requirements.

3) New Source Review – Nonattainment and Prevention of Significant Deterioration
(NSR, New Source Review, 40 CFR pt. 51 and 52)

3a) Did you construct, make any physical change to (as defined in 40 CFR § 51.165 or 52.21) or change the method of operation of (as defined in 40 CFR § 51.165 or 52.21) your facility since August 7, 1980?
☒ YES. Go to form **GI-09C REQUIREMENTS: NEW SOURCE REVIEW**.
☐ NO. Go to question 3b and answer NO.

3b) After completing the above question (and form GI-09C if necessary) check one of the following boxes:
☐ YES, my facility **is** subject to NSR requirements.
☒ NO, my facility **is not** subject to NSR requirements until I make a qualifying change.
☐ UNKNOWN. You may only check this box if directed to do so from **GI-09C REQUIREMENTS: NEW SOURCE REVIEW**.

4) Prevention of Significant Deterioration: Increment
(1990 Clean Air Act, as amended, Sections 109 and 160-169(B))

MPCA staff will advise on the applicability of this requirement after receipt of the application.

5) Standards of Performance for New Stationary Sources
(NSPS, New Source Performance Standards, 40 CFR pt. 60)

5a) Is your facility a Sulfuric Acid Plant?
- ☒ NO.
- ☐ YES, you may be subject to this regulation; complete the attached form **GI-09D REQUIREMENTS: NSPS** (you may skip question 5b).

5b) Have you constructed, modified (as defined in 40 CFR § 60.14), or reconstructed (as defined in 40 CFR § 60.15) your emission facility, or any portion thereof, after August 17, 1971?
- ☐ NO.
- ☒ YES, you may be subject to this regulation. Complete the attached form **GI-09D REQUIREMENTS: NSPS**.

5c) If you answered NO to questions 5a and 5b your facility is not subject to federal NSPS requirements. Answer "NO" to question 5d.

5d) After completing the above questions (and the attachment if necessary) check one of the following boxes:
- ☒ YES, my facility (or a portion of it) **is** subject to NSPS requirements.
- ☐ NO, my facility **is not** subject to NSPS requirements.

6) Acid Rain Program under Title IV
(40 CFR pt. 72, 40 CFR pt. 73; and 1990 Clean Air Act, as amended, Sections 401-416)

6a) Is your facility one of the Phase I or Phase II units listed below?

☒ NO. Go to question 6b.
☐ YES. Go to question 6c and answer YES.

Austin Utilities:	Northeast Station		
Interstate Power:	Fox Lake		
Minnesota Power and Light:	Clay Boswell	M.L. Hibbard	Syl Laskin
Northern States Power:	High Bridge Sherburne County Na. 1 -- 7237	Minnesota Valley Allen S. King Future Base	Riverside Black Dog
Otter Tail Power:	Hoot Lake		
Rochester Public Utility:	Silver Lake		

6b) Does your facility combust fossil fuel and generate electricity for wholesale or retail sale, such as a cogeneration facility, a qualifying facility (as defined in the Federal Power Act), independent power producer, or solid waste incinerator?

☐ NO. Go to question 6c and answer NO.
☒ YES. Your facility may be subject to Acid Rain Requirements. Refer to the applicability definitions in 40 CFR § 72.6 to find out if they apply.

6c) After completing question 6a and 6b, are you subject to Acid Rain Requirements?

☐ NO, my facility **is not** subject to Acid Rain Requirements.
☒ YES, my facility **is** subject to Acid Rain Requirements. Refer to Form **GI-09E REQUIREMENTS: ACID RAIN** for more information about applying for an acid rain permit.

7) Stratospheric Ozone Protection
(1990 Clean Air Act, as amended, Sections 601-618)

7a) To determine if this federal regulation applies to your facility, you must complete the attached form **GI-09F REQUIREMENTS: STRATOSPHERIC OZONE.**

7b) After completing form **GI-09F REQUIREMENTS: STRATOSPHERIC OZONE**, check one of the following boxes:

☐ YES, my facility **is** subject to this requirement.
☒ NO, my facility **is not** subject to this requirement.

8) RISK MANAGEMENT PROGRAMS FOR CHEMICAL ACCIDENTAL RELEASE PREVENTION
(40 CFR pt. 68, Section 112(r) of the Clean Air Act Amendments)

8a) Section 112(r) of the Clean Air Act requires facilities that produce, process, store or use any of the substances listed in form **GI-09G: RISK MANAGEMENT PROGRAMS FOR CHEMICAL ACCIDENTAL, RELEASE PREVENTION** (40 CFR pt. 68), in amounts greater than the listed thresholds, to develop and implement a risk management plan for accidental releases.

8b) Determine if you produce, process, store or use any of the substances listed in form **GI-09G: RISK MANAGEMENT PROGRAMS FOR CHEMICAL ACCIDENTAL, RELEASE PREVENTION**, and check one of the following boxes:

☐ Yes, my facility **does** produce, process, store or use one or more of the substances listed in form **GI-09G**, in amounts exceeding the listed thresholds.

☒ No, my facility **does not** produce, process, store or use any of the substances listed in form **GI-09G**, in amounts exceeding the listed thresholds.

9) Compliance Assurance Monitoring
(CAM, 40 CFR pt. 64)

9a) To determine if the CAM regulations apply to your facility, you must complete the attached form **GI-09H REQUIREMENTS: CAM**.

9b) After completing question 9a, above, check one of the following boxes:

☐ YES, my facility **is** subject to CAM requirements.

☒ NO, my facility **is not** subject to CAM requirements.

10) Federal Ozone Measures for the Control of Emissions from Certain Sources
(1990 Clean Air Act, as amended, Section 183(e))

10a) As of April 30, 1998, no rules have been promulgated under the above section of the Clean Air Act. If your facility manufactures, processes, wholesale distributes or imports consumer or commercial products that emit volatile organic compounds, it may be subject to any rules that are adopted under § 183(e) requiring emission reductions. When the rules are promulgated, you must comply with them.

11) Minnesota State Air Quality Rules

11a) To determine which Minnesota State rules you may be subject to, go to form **GI-09I REQUIREMENTS: STATE RULES**.

11b) Whether permitted or not, **every business** and activity in Minnesota **is subject to the rules listed in the following table**:

Title of the Rule	Minnesota Rules (Chapter or Part)	What the Content of the Rule is:
Air Quality Emission Fees	Part 7002.0025 - 7002.0095	Requires facilities to pay emission fees every year within 60 days of MPCA billing.
Air Emission Permits	Parts 7007.0050 - 7007.1850	Outlines when an air emission permit is required and procedures for obtaining one.
Minnesota and National Ambient Air Quality Standards	Part 7009.0010 - 7009.0080	No one is allowed to emit any of the limited pollutants in such a manner that ambient levels of the pollutant are higher than the maximum level.
Applicability of Standards of Performance	Parts 7011.0010, and 7011.0050	Indicates that facilities must comply with all applicable state air pollution rules.
Circumvention	Part 7011.0020	States that no one may conceal or dilute emissions which would otherwise violate a federal or state air pollution control rule.
Emission Standards for Visible Air Contaminants	Part 7011.0100 - 7011.0120	Outlines restrictions against emitting opaque smoke from facilities.
Preventing Particulate Matter from Becoming Airborne	Part 7011.0150	States that no person shall cause particulate matter to become airborne if it can be avoided with listed preventative measures.
Continuous Monitors	Part 7017.1000	Outlines requirements for continuous monitoring systems.
Performance Tests	Part 7017.2001 - 7017.2060	Outlines procedures and methods for emissions and performance testing if required.
Notifications	Part 7019.1000	Requires facilities to notify the MPCA of shutdowns and breakdowns.
Reports	Part 7019.2000	Requires specific records and reports from facilities with continuous monitoring systems.
Emission Inventory	Part 7019.3000 - 7019.3100	Requires facilities to submit an Emission Inventory Report by April 1 every year.
Motor Vehicles	Part 7023.0100 - 7023.0120	Outlines restrictions against emitting opaque smoke from motor vehicles, trains, boats, construction equipment and stationary internal combustion engines.
Noise Pollution Control	Part 7030.0010 - 7030.0080	Sets noise standards which cannot be exceeded.

12) You have completed the Applicable Requirements form.

MINNESOTA POLLUTION CONTROL
AGENCY
AIR QUALITY
520 LAFAYETTE ROAD
ST. PAUL, MN 55155-4194

PERMIT APPLICATION FORM **GI-09A**

REQUIREMENTS: NESHAP FOR SOURCE CATEGORIES (40 CFR pt. 63)

11/17/03

National Emission Standards for Hazardous Air Pollutants for source categories
(NESHAP for Source Categories, 40 CFR pt. 63)

1) Read through Table A, the list of Hazardous Air Pollutants (HAP) and check one of the following:

☐ No, my facility **does not currently** emit any pollutants from the list, and therefore is not subject to the requirements for NESHAP for Source Categories. Go to question 7.

☒ Yes, my facility **does** emit one or more pollutants from the list. Go on to question 2a.

2a) Does your source have the potential to emit 10 tons per year or more of any single pollutant listed in Table A?

☐ Yes, my facility is a major source of HAP emissions. Go to question 3.

☒ No. Go to question 2b.

2b) Does your source have the potential to emit 25 tons per year or more of any combination of pollutants listed in Table A?

☐ Yes, my facility is a major source of HAP emissions. Go to question 3.

☒ No. Go to question 6.

3) If you answered yes to question 2a or 2b, it may be possible to avoid the requirements associated with being a major source of HAP emissions. If the **actual emissions** of HAPs from your facility will not exceed 10 tons per year of a single HAP or 25 tons per year of all HAPs combined during each of the next five years, you may propose federally enforceable permit conditions to limit your potential HAP emissions to less than 10 tons per year for each HAP and/or 25 tons per year for all HAPs combined. Do you want to accept permit limitations on HAPs to avoid being a major source of HAPs?

☐ No. Go to question 4.

☐ Yes. Briefly describe the limitations you would be willing to accept and abide by in your permit so that your HAP emissions will not exceed 10 tons per year for each HAP and 25 tons per year for all HAPs combined (use separate sheet if needed). Description must include each of the HAP pollutants. Refer to the Application General Instructions for guidance in establishing these limitations, and include your proposed limit, monitoring, recordkeeping, and reporting on Form CD-01. Your facility may be subject to NESHAP for Source Categories requirements until you receive a federally enforceable permit limiting your facility's HAP emissions to a nonmajor source. When you return to form **GI-09 Requirements**, you must answer "YES" to question 1b. To determine whether your facility is subject to NESHAP for nonmajor sources, go to question 6.

4) The attached Table B is a list of NESHAP for Source Categories and important dates associated with each of them. Does your facility have any equipment that fits any of the source categories listed?

☐ No. Go to question 6.
☐ Yes. List all the source categories applicable to your facility, and the associated dates shown in Table B.

---

5) If you answered no to question 3 **and** yes to question 4, please read all applicable sections of 40 CFR pt. 63 to determine all applicable requirements in each of the NESHAP for Source Categories. When you return to form **GI-09 Requirements**, you must answer "YES" to question 1b.

6) If your source has any equipment that belongs to the following area source categories, place a check in the box next to that category and read the specified NESHAP for Source Categories to determine all applicable requirements for area sources. The rules for these source categories may apply whether or not your facility is considered a major source for hazardous air pollutants. If you check one or more boxes below, you must answer "YES" to question 1b when you return to form **GI-09 Requirements**. Go on to question 7.

☐ Hard and Decorative Chromium Electroplating (40 CFR pt. 63, subp. N)
☐ Chromium Anodizing Tanks (40 CFR pt. 63, subp. N)
☐ Ethylene Oxide Commercial Sterilization and Fumigation Operations (40 CFR pt. 63, subp. O)
☐ Perchloroethylene Dry Cleaning Facilities (40 CFR pt. 63, subp. M)
☐ Secondary Lead Smelting Facilities (40 CFR pt. 63, subp. X)
☐ Halogenated Solvent Degreasers (40 CFR pt. 63, subp. T)

7) Does this permit application seek authorization to construct or reconstruct a major source of HAP (10 tpy or more of any pollutant listed on Table A, or 25 tpy or more of any combination of pollutants listed in Table A)?

☐ Yes. Go on to question 8.
☒ No. Return to form **GI-09 Requirements** and answer "NO" to question 1c.

8) Is your proposed project subject to any of the promulgated standards as listed in Table B?

☐ Yes, my facility is subject to the preconstruction review requirements under its MACT standard and to the General Provisions of the MACT standard. Return to form **GI-09 Requirements** and answer "YES" to question 1b and "NO" to question 1c.
☐ No, my facility may be subject to preconstruction review requirements under section 112(g)(2)(B). Go to question 9.

9) If you answered "No" to question 8, it may be possible to avoid the section 112(g)(2)(B) requirement of performing a case-by-case MACT determination for your proposed project by proposing a federally enforceable permit conditions to limit your potential HAP emissions to less than 10 tons per year for each HAP and/or 25 tons per year for all HAPs combined from the new proposed project. Do you want to accept permit limitations on HAPs to avoid the section 112(g)(2)(B) requirement?

☐ No. Go to question 10.

☐ Yes. Briefly describe the limitations you would be willing to accept and abide by in your permit so that your HAP emissions will not exceed 10 tons per year for each HAP and 25 tons per year for all HAPs combined (use separate sheet if needed). Description must include all the HAP pollutants. Refer to the Application General Instructions for guidance in establishing these limitations, and include your proposed limit, monitoring, recordkeeping, and reporting on Form CD-01. Your facility may be subject to NESHAP for Source Categories requirements until you receive a federally enforceable permit limiting your facility's HAP emissions from the proposed project to below the major source thresholds. When you return to form **GI-09 Requirements**, you must answer "YES" to question 1c.

10) If you answered "No" to question 8 **and** "No" to question 9, please read 40 CFR § 63.43 to 63.44 to determine all applicable requirements, including application requirements for a case-by-case MACT determination and what is required for your facility when a subsequent MACT standard for your facility is promulgated. When you return to form **GI-09 Requirements**, you must answer "YES" to question 1c.

11) Return to form **GI-09 Requirements**, and answer questions 1b and 1c using the above information.

MINNESOTA POLLUTION CONTROL AGENCY
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PERMIT APPLICATION FORM **GI-09B**
REQUIREMENTS: NESHAP
(40 CFR pt. 61)
05/11/98

National Emission Standards for Hazardous Air Pollutants
(NESHAP, 40 CFR pt. 61)

1) Part 61 NESHAPs were the regulations in existence before the 1990 Clean Air Act Amendments. They apply only to air emission sources listed in Table C (attached) that emit the pollutants listed. Table C contains:

- a pollutant;
- a facility description;
- a Minnesota Rules reference;
- a Code of Federal Regulation 40 part 61 (40 CFR pt. 61) subpart reference.

2) Read through Table C. If your facility emits any of the listed pollutants, and your facility type, process or equipment matches those associated with the pollutant, a NESHAP may apply to you. To determine if a standard applies to your facility, refer to the corresponding 40 CFR pt. 61 subpart(s) and Minnesota Rules listed and read the requirements in detail.

3) After reviewing the NESHAP reference list and reading the corresponding 40 CFR pt. 61 subpart(s) check one of the following boxes:

☒ NO, my facility **is not** subject to NESHAP requirements. Return to form **GI-09 Requirements**, and answer "NO" to question 2b.

☐ YES, my facility (or a portion of it) **is** subject to NESHAP requirements. Answer "YES" to question 2b when you return to form **GI-09 Requirements**.

If you have determined that your facility must comply with federal NESHAP requirements, you are also subject to state NESHAP requirements. Minn. R. ch. 7011 lists Minnesota State NESHAP requirements.

4) Check and complete the following questions (4a, 4b, and 4c). Some NESHAPs apply to an entire mine, plant or shop. Others apply to specific units, like a reactor, valve or vessel. If you check 4c, you must complete a group of questions for each emission unit subject to a NESHAP. Attach additional pages as necessary to identify all emission units subject to NESHAP at your facility. Photocopy each 40 CFR pt. 61 subpart you have listed (*except* the Asbestos NESHAP), ***highlight*** the portions of the subpart that directly applies to your facility, and attach the copies to this application form.

4a) ☐ My business is only subject to the NESHAP for the Demolition and Renovation of Asbestos containing structures identified in 40 CFR § 61.145; I do not need an Air Emission Permit. I have contacted the MN Department of Health and the asbestos team at the MN Pollution Control Agency regarding any renovation or demolition projects and have obtained an asbestos abatement permit if necessary. (For more information refer to Minn. Rules 7007.0300, subp. 1.C.)

4b) ☐ My entire facility is subject to NESHAP requirements.

Describe Emission Facility _____
Date of Facility Construction _____
Applicable 40 CFR pt. 61 subparts(s) _____
Applicable Minnesota State Rule Reference _____
Has this Source Been Permitted Previously?
☐ NO
☐ YES, list Air Emission Permit Number

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PERMIT APPLICATION FORM **GI-09C**

REQUIREMENTS: NEW SOURCE REVIEW (40 CFR pt. 52)

05/11/98

New Source Review
(NSR; 40 CFR pt. 52)

Throughout this form you are asked for the Potential to Emit (PTE) of your facility or of changes to your facility. The PTE values in most cases are defined as the maximum uncontrolled PTE of the emission facility. In some cases, PTE calculations may reflect factors such as control equipment or permit limitations, but **ONLY** if proof is given that such factors were provisions of a federally enforceable permit issued to the facility.

New Source Review (NSR) regulations may apply to modifications to existing facilities or for the construction of a new facility. There are two kinds of review: one for nonattainment areas and one for attainment areas. For a nonattainment pollutant, if the potential to emit is more than 100 tons per year, New Source Review could apply. For attainment areas, the threshold is 100 or 250 tons per year depending on the type of facility.

This form is rather complex, but addresses a complicated regulatory program. Each item is intended to assist you in the process of determining applicability as easily and quickly as possible. Items 1-3 will help you determine the threshold -- a federally established pollutant level -- for your facility. The next two items, 4 and 5, determine if, based on your current PTE, you are considered a major stationary source. If your facility is not a major source now, item 6 asks if it was major in the past. Item 7 determines if you can accept "synthetic minor" limitations, while item 8 requires you to specify what these limitations would be.

It may be possible for sources that were major to become synthetic minor facilities. Items 9-10 are basic criteria questions that need to be answered. Sources who wish to pursue this option will need to work closely with MPCA staff to determine if the facility does qualify for the synthetic minor status. Items 11, 12, and 13 determine if you constructed a major facility. Item 14 requires a description of each change (physical or operational) made at your facility after it actually began emitting pollutants at a rate higher than your threshold. A detailed description is required for each change, including dates and emission levels through today. If necessary and/or allowed, item 14f requires you to specify "synthetic minor" limitations for just the change. Item 14 must be filled out separately for each change made, requiring duplication of those two pages. Item 15 directs specific sources to contact the MPCA for further guidance.

1) Is your facility defined as one of the following, (Some SIC Code(s) applying to specific categories are given in parentheses):

Coal Cleaning Plants-With Thermal Dryers	Kraft Pulp Mills (2611, 2621)
Portland Cement Plants (3241)	Primary Zinc Smelters (3339)
Iron and Steel Mills (332X)	Primary Aluminum Ore Reduction Plants (3334)
Primary Copper Smelters (3331)	Municipal Incinerators Capable of Charging More Than 250 Tons of Refuse per Day
Hydrofluoric Acid Plants (2819, 2899)	Sulfuric Acid Plants (2819)
Nitric Acid Plants (2873)	Petroleum Refineries (2911)
Lime Plants (3274)	Phosphate Rock Processing Plants (1475)
Coke Oven Batteries (3312)	Sulfur Recovery Plants (2819)
Carbon Black Plants (Furnace Process, 2895)	Primary Lead Smelters (3339)
Fuel Conversion Plants	Sintering Plants*
Secondary Metal Production Plants (334X)	Chemical Process Plants (28XX)
Fossil-Fuel Boilers (or combination thereof) totaling more than 250 MMBtu/hr	Petroleum Storage & Transfer Units, Total Storage Capacity over 300,000 Barrels
Taconite Ore Processing Plants (1011)	Glass Fiber Processing Plants
Charcoal Production Plants (2819, 2861)	Fossil Fuel-Fired Steam Electric Plants of more than 250 MMBtu/hr

* Processing of fine grain materials into coarser lumps (performed primarily on ores).

☒ NO, my facility is not classified as one of the 28 sources listed above. Go to item 2.
☐ YES, my facility is classified as one of the 28 sources listed above. An air emission source having PTE (potential to emit) more than 100 TPY (tons per year) of any single regulated pollutant is considered a major stationary source. **For the rest of this form, 100 TPY is the threshold you must use in answering the questions**. Go to item 4.

2) Is your facility located in a nonattainment area (see form **GI-01 Facility Information**, question 14)?
☒ NO. Go to item 3.
☐ YES. Check all of the following pollutants that apply:

☐ PM_{10} ☐ SO_2 ☐ CO

An air emission source having the potential to emit more than 100 TPY of any pollutant(s) checked above, or 250 TPY of any single regulated pollutant not checked above is considered a major stationary source. **For the rest of this form, 100 TPY is the threshold for any pollutant(s) checked above, and 250 TPY is the threshold for the remaining regulated pollutants. You must use these values in answering the remaining questions**. Go to item 4.

3) I answered NO to items 1 and 2; my facility is not one of the 28 sources listed and my facility is not located in a non-attainment area. An air emission source having the potential to emit of more than 250 TPY of any single regulated pollutant is considered a major stationary source. **For the rest of this form, 250 TPY is the threshold you must use in answering the questions.**

4) In the boxes below, enter the current PTE (in tons per year) of your entire facility under each regulated pollutant. ("Current PTE" means the PTE of your facility prior to receiving the permit for which you are now applying.)

PM_{10}	PM (includes PM_{10})	SO_2	NO_X	VOC	CO	Pb	Fluorides
74.8	74.8	57.3	248.6	12.1	144.8	0.0207	NA

Sulfuric Acid Mist	H_2S	Total reduced sulfur (includes H_2S)	Reduced sulfur compounds (includes H_2S)	MWC organics	MWC metals	MWC acid gases	MSW landfill gases	Ozone-depleting substances
7.6	NA	NA	NA	NA	NA	NA	NA	NA

5) Is the current PTE of your facility above the 100/250 TPY threshold for your facility, making your facility a major stationary source?

☐ YES. My facility is currently considered a major stationary source, go to question 7.

☒ NO. Go to question 6.

6) Since August 7, 1980, has the PTE of your facility ever exceeded your 100/250 TPY threshold value?

☐ YES. Go to question 7.

☒ NO. My facility is not subject to NSR until I make a qualifying change. Return to form **GI-09 Requirements** and answer "NO" to question 3b.

[Note: If you do not know what the PTE of your facility has been in the past, it is sufficient for the purposes of **this question only** to use the following formula to ***roughly estimate*** PTE:

(8760 hours/year) x (actual emissions of a pollutant for a given year in tons/year)/(the number of hours of operation for that year).

Again, **this formula cannot be used for any other purpose.** This is only a screening test, it does not represent the required PTE calculation method for air permitting.

7) Since August 7, 1980, have the **actual emissions** from your facility ever exceeded the 100/250 TPY threshold value for your facility?

☐ YES. Go to item 9.

☒ NO. My facility is allowed to accept federally enforceable permit limitations to limit potential emissions to less than a major source (below the threshold). Go to question 8.

8) The **actual emissions** from your facility have never exceeded the 100/250 TPY threshold established for your facility. Would you be willing to accept federally enforceable permit limitations to limit potential emissions from your facility to less than the 100/250 TPY threshold?

☐ NO. Go to item 11.

☒ YES. You are required to specify limitations (called synthetic minor limits) for your facility. These limitations will limit your air emissions. This will be dependent on your emission sources and can have some flexibility. Briefly describe what limitations you would be willing to accept and abide by. Refer to the Application General Instructions for guidance in establishing these limitations. Include the specific limits, monitoring, recordkeeping, and reporting on Form CD-01.

Limitations on fuel use

(DUPLICATE THIS FORM OR ADD EXTRA PAGES AS NEEDED)

Return to form **GI-09 Requirements**, question 3b, and check Unknown.

9) Have you removed any equipment from your facility since the **actual emissions** exceeded the 100/250 TPY threshold?

☐ NO. Go to question 11.

☐ YES. Go to question 10.

10) Have the actual emissions from the facility remained under the 100/250 TPY threshold for the last two years?

☐ NO. Go to question 11.

☐ YES. It may be possible to obtain a synthetic minor permit for your facility. **Complete the remaining items in this form and contact the MPCA for further guidance as listed in item 15.**

11) Did you construct your facility after August 7, 1980?

☐ NO. Go to question 14.

☐ YES, construction on my facility began on (date) _____. The PTE of my facility (in tons per year) when constructed was:

PM_{10}	PM (includes PM_{10})	SO_2	NO_X	VOC	CO	Pb	Fluorides

Sulfuric Acid Mist	H_2S	Total reduced sulfur (includes H_2S)	Reduced sulfur compounds (includes H_2S)	MWC organics	MWC metals	MWC acid gases	MSW landfill gases	Ozone-depleting substances

12) Are any of the PTE values entered in question 11 greater than the 100/250 TPY threshold for your facility?

☐ NO. Go to question 14.

☐ YES. Go to question 13.

13) Have the actual emissions for the operations installed during the facility's construction ever exceeded the 100/250 TPY threshold for any year after the construction date?

☐ NO. Go to question 14.

☐ YES. My facility was a major source when it was constructed. If a BACT/LAER analysis **was not** done at the time of construction, the facility may be subject to backward looking NSR (if the analysis was not done at the time of construction but has been done since, it may not be necessary to repeat it). Contact the Permit Technical Advisor at (651)282-5844 or (800)646-6247 for additional guidance. Go to question 14**.**

14) NSR groups changes made during the same budget or planning period as a single modification. This means that changes need to be grouped together based on budgeting or planning periods and evaluated as one modification to determine if NSR/PSD applies to the changes that have been made.

Items 14a through 14g need to be completed for each modification made at your facility, through the current date (include any modifications you are proposing in this application, too). Begin with the first modification after the PTE of your facility exceeded the 100/250 TPY threshold or the first modification made after August 7, 1980, whichever is later. DO NOT INCLUDE modifications which were authorized by a permit from the MPCA. Duplicate and add additional pages as necessary. (Note: if your facility was under the 100/250 TPY threshold and the first modification you made was over 100/250 TPY, provide the information listed in items 14a, b, c, d, e, and f on a separate sheet of paper.) If you have not modified your facility since meeting the 100/250 TPY threshold, go to form **GI-09 Requirements**, question 3b, and answer "NO."

14a) Describe the physical change in or change in method of operation to your facility:

14b) In what year(s) did the modification occur?_____

14c) List the potential emissions increase (in tons per year) of each pollutant for this modification.

PM_{10}	PM (includes PM_{10})	SO_2	NO_X	VOC	CO	Pb	Fluorides

Sulfuric Acid Mist	H_2S	Total reduced sulfur (includes H_2S)	Reduced sulfur compounds (includes H_2S)	MWC organics	MWC metals	MWC acid gases	MSW landfill gases	Ozone-depleting substances

14d) Are the values you entered in item 14c for this modification greater than the values listed in item 14e for each regulated pollutant?

☐ NO. This was a minor change, go to question 14g.

☐ YES. Go to question 14e.

14e) Beginning with the year entered in item 14b through the current date, did the actual emissions of regulated pollutants resulting only from this modification ever exceed the values listed in the following table?

Pollutant	Threshold (tons/year)	Effective Date
PM_{10}	15	July 31, 1987
PM	25	August 7, 1980
SO_2	40	August 7, 1980
NO_X	40	August 7, 1980
VOC	40	August 7, 1980
CO	100	August 7, 1990
Pb	0.6	August 7, 1980
Fluorides	3	August 7, 1980
Sulfuric Acid Mist	7	August 7,. 1980
H_2S	10	August 7, 1980
Total reduced sulfur	10	August 7, 1980
Reduced sulfur compounds	10	August 7, 1980
MWC organics	3.5×10^{-6}	August 12, 1991
MWC metals	15	August 12, 1991
MWC acid gases	40	August 12, 1991
MSW landfill gases	50	March 12, 1996
Ozone depleting substances	100	March 19, 1998 (EPA memo)

☐ YES. This modification is subject to backward looking NSR, unless a BACT/LAER analysis was done at the time of modification. (If analysis was not done at the time of modification, but has been done since then, it may not be necessary to repeat it.) Contact the Permit Technical Advisor at (651)282-5844 or (800)646-6247 for additional guidance.

☐ NO. Go to question 14f.

14f) The actual emissions from this modification have never exceeded the levels listed in item 14e. Are you willing to accept federally enforceable permit limitations to limit the potential emissions increase of the modification to less than those levels?

☐ NO. Go to item 14g.

☐ YES. You are required to specify limitations (called "synthetic minor" limits) for this change. These limits will limit your air emissions to below the levels listed in item 14e. This will be dependent on your emissions sources and can have some flexibility. Briefly describe what limitations you would be willing to accept and abide by. Refer to the Application General Instructions for guidance in establishing these limitations. Include the specific limits, monitoring, recordkeeping, and reporting on Form CD-01.

(DUPLICATE THIS FORM OR ADD EXTRA PAGES AS NEEDED)

Go to item 14g.

14g) Repeat item 14 until each non-permitted physical change or change in method of operation to your facility has been identified, duplicating item 14 as necessary.

15) It may be possible to accept synthetic minor permit limitations if your actuals have exceeded the threshold levels, if you have removed equipment and the actual emissions for the last two calendar years of operation have remained under the threshold levels. You should contact the MPCA for more guidance on whether your facility qualifies for synthetic minor limitations.

If you have triggered NSR/PSD levels and cannot or choose not to accept synthetic minor limitations, you need to check YES to question 3b on **Form GI-09 Requirements**. If your facility has received permits for modifications or completed NSR/PSD reviews as requested by the MPCA, you should work with MPCA staff to determine the compliance status of your facility regarding NSR/PSD and establishing limits.

MINNESOTA POLLUTION CONTROL AGENCY
AIR QUALITY
520 LAFAYETTE ROAD
ST. PAUL, MN 55155-4194

PERMIT APPLICATION FORM **GI-09D**
REQUIREMENTS: NSPS (40 CFR pt. 60)
05/11/98

Standards of Performance for New Stationary Sources

(NSPS, New Source Performance Standards, 40 CFR pt. 60)

1) NSPS are federal rules that define limits, testing and monitoring for certain specific emission units. These standards are proposed and promulgated in the Federal Register and published in the Code of Federal Regulations, title 40 part 60 (40 CFR pt. 60). Table D lists the standards promulgated through April 1998. Table D may not be complete if a new NSPS has been promulgated since this form was last revised. The table contains:

- a brief emission source description;
- a corresponding 40 CFR pt. 60 subpart reference;
- an effective date for all performance standards promulgated as of April 1998.

[Please note: the best way to keep up-to-date on NSPS regulations is through the EPA's Web page (www.epa.gov) or the Federal Register since there can be a significant time lag between the date when a standard is proposed or promulgated and when it is finally published in the Code of Federal Regulations.]

2) Please read through the emission sources in Table D. If you have modified (as defined in 40 CFR § 60.14), reconstructed (as defined in 40 CFR § 60.15) or constructed the described emission source on or after the effective date listed in the table, your facility may be subject to the requirements of 40 CFR pt. 60. Generally, reconstruction means that the cost of a repair exceeds 50 percent of what it would cost to install a new emission unit. If you have had an extensive and expensive repair, it may count as a reconstruction.

If you know or suspect standards may apply to your facility you must refer to the corresponding 40 CFR pt. 60 subpart and read the requirements in detail to make a final determination. Note: the general provisions found in 40 CFR pt. 60, subp. A, apply to all facilities subject to any other NSPS requirements.

3) After you review the list of sources subject to NSPS and read any applicable 40 CFR pt. 60 subparts, check one of the following boxes:

☐ NO, my facility is not subject to NSPS. Return to Form **GI-09 Requirements**, and answer "NO" to question 5d.

☒ YES, my facility is subject to NSPS.

4) The following page lists information needed to identify your facility's emission sources subject to NSPS. Complete the group of questions for all emission equipment subject to NSPS, attaching additional pages if necessary. Photocopy each 40 CFR pt. 60 subpart you have listed and highlight the portions of each subpart that directly apply to your facility, including the general provisions found in Subpart A. Attach the copies to this application form.

The MPCA has reprinted Subpart A and some additional NSPS regulations from the *Code of Federal Regulations.* The available regulations are starred in Table D. To obtain copies, contact the Permit Document Coordinator at (651)282-5843.

5) Return to Form **GI-09 Requirements**, and answer "YES" to question 5d.

Describe Emission Equipment	Simple Cycle Combustion Turbine #1	
Emission Unit Number	001	
Stack/Vent Number	001	
Date of Equipment Manufacture	TBD	(Month/Date/Year)
Date of Equipment Installation	TBD	(Month/Date/Year)
Date of Reconstruction (if applicable)	NA	(Month/Date/Year)
Date of Modification (if applicable)	NA	(Month/Date/Year)
Applicable 40 CFR pt. 60 subpart or Federal Register Reference	Subpart GG	

This source is also subject to the general provisions of 40 CFR pt. 60, subp. A.

Has this Unit Been Permitted Previously?

- ☒ NO
- ☐ YES, list Air Emission Permit Number _____

Have you attached a photocopied, highlighted version of the 40 CFR pt. 60 subpart?

- ☐ YES
- ☒ NO

Describe Emission Equipment	Simple Cycle Combustion Turbine #1	
Emission Unit Number	002	
Stack/Vent Number	002	
Date of Equipment Manufacture	TBD	(Month/Date/Year)
Date of Equipment Installation	TBD	(Month/Date/Year)
Date of Reconstruction (if applicable)	NA	(Month/Date/Year)
Date of Modification (if applicable)	NA	(Month/Date/Year)
Applicable 40 CFR pt. 60 subpart or Federal Register Reference	Subpart GG	

This source is also subject to the general provisions of 40 CFR pt. 60, subp. A.

Has this Unit Been Permitted Previously?

- ☒ NO
- ☐ YES, list Air Emission Permit Number _____

Have you attached a photocopied, highlighted version of the 40 CFR pt. 60 subpart?

- ☐ YES
- ☒ NO

Describe Emission Equipment		
Emission Unit Number		
Stack/Vent Number		
Date of Equipment Manufacture		(Month/Date/Year)
Date of Equipment Installation		(Month/Date/Year)
Date of Reconstruction (if applicable)		(Month/Date/Year)
Date of Modification (if applicable)		(Month/Date/Year)
Applicable 40 CFR pt. 60 subpart or Federal Register Reference		

This source is also subject to the general provisions of 40 CFR pt. 60, subp. A.

Has this Unit Been Permitted Previously?

- ☐ NO
- ☐ YES, list Air Emission Permit Number _____

Have you attached a photocopied, highlighted version of the 40 CFR pt. 60 subpart?

- ☐ YES
- ☐ NO

DUPLICATE THIS FORM AS NEEDED

MINNESOTA POLLUTION CONTROL AGENCY
AIR QUALITY
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ST. PAUL, MN 55155-4194

PERMIT APPLICATION FORM **GI-09F**

REQUIREMENTS: STRATOSPHERIC OZONE PROTECTION (40 CFR pt. 82)

05/11/98

Stratospheric Ozone Protection
(1990 Clean Air Act, as amended, Sections 601-618; 40 CFR pt. 82)

The 1990 Clean Air Act Amendments, Sections 601-618 and federal regulations located in 40 CFR pt. 82 regulate ozone depleting substances and requires a phase out of their use. Review the attached list of ozone depleting chemicals, Tables E and F. If you manufacture, sell, distribute or use any the chemicals in Tables E and F, then Sections 601-618 and 40 CFR pt. 82 apply to your facility. Please read Sections 601-618 and 40 CFR pt. 82 to determine all the requirements that apply to your facility.

1) After reviewing Table F check one of the following:

☒ NO, my facility **does not** manufacture, sell, distribute or use any chemicals from the list, and the 1990 Clean Air Act, as amended, Sections 601-618 do not apply to my facility. Return to Form **GI-09 Requirements**, question 7b.

☐ YES, my facility **does** manufacture, sell, distribute or use one or more of the chemicals from the list. Go to question 2.

2) Indicate below which chemicals you manufacture, sell, distribute or use; whether the chemical is Class I or Class II; and what chemical your facility will be using to replace the phased out chemical. Include additional pages if necessary:

2a) Chemical Name:	**2b)** Class Type:	**2c)** CAS Number:	**2d)** Replacement Chemical (after phase out):

3) Return to form **GI-09 Requirements**, question 7b.

Minnesota Pollution Control Agency
AIR QUALITY
520 LAFAYETTE ROAD NO., ST. PAUL, MN 55155-4194

PERMIT APPLICATION FORM **GI-09H**

REQUIREMENTS: CAM (40 CFR pt. 64)

02/17/04

Compliance Assurance Monitoring (40 CFR pt. 64)

The CAM rule applies to certain emission units at facilities required to obtain a Part 70 permit.

In general, CAM applies to emission units meeting the following criteria:

1. The emission unit is subject to an emission limit or standard (including limits and standards in Minnesota Rules contained in the State Implementation Plan) for an air pollutant regulated by Part 70;

2. Compliance with the applicable limit or standard is achieved through the use of add-on control equipment; and

3. The emission unit has pre-controlled potential emissions of the applicable regulated air pollutant that are equal to or greater than 100 percent of the Part 70 major source level for that pollutant (in tons per year).

For exemptions, see the table at the end of this form.

Use of continuous emissions monitoring system (CEMS), continuous opacity monitoring system (COMS), or predictive emission monitoring system (PEMS) does not qualify as an exemption to the CAM rule. However, §64.3(d) states that use of a CEMS, COMS, or PEMS meets the requirements of CAM.

CAM applicability is determined on a pollutant-by-pollutant basis for each "pollutant specific emissions unit," defined at 40 CFR § 64.1 as "an emissions unit considered separately with respect to each regulated air pollutant." For purposes of CAM submittal requirements, a "**large pollutant specific emissions unit**" is an emissions unit with potential controlled emissions equal to or greater than 100% of the major source threshold amount for a given regulated pollutant. ("Major source threshold amount" as it applies to Minnesota, means 100 tons per year of particulate matter smaller than ten microns in aerodynamic diameter (PM_{10}), sulfur dioxide (SO_2), nitrogen oxides (NO_X), volatile organic compounds (VOC), carbon monoxide (CO), or lead; 10 tons per year of any hazardous air pollutant (HAP); or 25 tons per year of any combination of HAPs. The levels may be different in current or future nonattainment areas. Refer to 40 CFR § 70.2 under the definition of "major source" for further detail.) "**Other pollutant specific emissions units**" are those units whose uncontrolled potential emissions may be equal to or greater than 100% of the major source threshold amount, but controlled emissions are less than that threshold.

If you are applying for the first time for a Part 70 permit, after determining the uncontrolled and controlled potential emissions of the emissions units, the following questions must be considered for each **large** pollutant specific emissions unit, as defined above..

If you are applying for a major amendment to an existing Part 70 permit, after determining the uncontrolled and controlled potential emissions of the emissions units, the following questions must be considered for each **large** pollutant specific emissions unit, as defined above, to which the amendment is applicable.

If you are applying for reissuance of an existing Part 70 permit, after determining the uncontrolled and controlled potential emissions of the emissions units, the following questions must be considered for each pollutant specific emissions unit **(large and other)** for which CAM applicability has not already been determined through a Part 70 permitting action.

1) Is the unit subject to an emission limitation or standard, specified in either a rule or permit? For existing emission units, check your current permit to see if there are any emission limits specified for the emission unit.

(No,) the emission unit is not subject to CAM. Repeat question 1 with next emission unit.
Yes, the emission unit is subject to an emission limitation or standard. Go on to question 2.

2) Is an add-on control device used to achieve compliance with that limitation or standard? (For example, a boiler may have a NO_X limit and an SO_2 limit. If the boiler uses lime injection for SO_2 control but relies on a low-NO_X burner to meet the NO_X limit, then the emission unit would be subject to CAM for SO_2 but not for NO_X.) Not applicable.

No, the emission unit is not subject to CAM. Return to question 1 and repeat with next emission unit.
Yes. Go on to question 3.

3) There are some exemptions allowed by the rule. Review the list of exemptions in Table A, then answer the following question.

Yes, the emission unit is exempt from CAM. Return to question 1 and repeat with next emission unit.
No, the emission unit is subject to CAM. List the emission unit in the table in question 4 and repeat questions 1 through 3 for the next emissions unit. When each emission unit has been considered, go on to complete the rest of question 4

4) List each emission unit which is subject to CAM and the type of control equipment and pollutant.

EU #	Emission Unit	CE #	Description of Control Equipment	Pollutant(s) which are subject to CAM

Duplicate this table as needed.

5) You must prepare a CAM submittal for each unit listed in item 4, and provide it with the permit or amendment application. The CAM submittal, also referred to as the monitoring approach submittal, should include:

- information on indicators (gauges, meters, or other devices used to monitor operating parameters of control equipment)
- indicator ranges, or the process by which indicators are to be established
- performance criteria
- justification for the proposed monitoring
- control device operating data recorded during a performance test, supplemented by engineering assessments or manufacturer's recommendations to justify the proposed indicator range
- a test plan and schedule for obtaining data if performance test data are not available
- an implementation plan, if monitoring requires installation, testing or other activities prior to implementation

Some of this information will be incorporated into the operating permit. The permit will specify the approved monitoring approach and the indicator range(s), including the averaging periods.

For additional information, please refer to the CAM rule at 40 CFR pt. 64.
Additional information, including a Technical Guidance Document that includes example submittals, is available on the Internet at http://www.epa.gov/ttn/emc/cam.html

Table A

CAM RULE EXEMPTIONS

The CAM rule does not apply to:

1. Units subject to emission limitations or standards proposed by EPA after November 15, 1990, pursuant to section 111 or 112 of the Clean Air Act. In situations where some portions of a facility operate control devices in order to comply with emission standards issued prior to November 15, 1990, only those portions of the facility must comply with the requirements of the CAM rule.

2. Situations where continuous compliance monitoring is already specified in an operating permit. The CAM rule exempts the Permittee from additional monitoring requirements and directs the Permittee to use the continuous compliance monitoring data to fulfill the CAM rule monitoring and certification requirements.

3. Stratospheric ozone protection requirements

4. Acid Rain Program requirements

5. Emission limitations or standards that apply solely under an emissions trading program

6. Municipally-owned utility peak-shaving units where
   - ⇒ the unit is exempt from all Acid Rain Program monitoring requirements, and
   - ⇒ the unit operates for the sole purpose of providing electricity during periods of peak electrical demand or emergency situations, and
   - ⇒ the unit will be operated consistent with that purpose throughout the permit term, and
   - ⇒ emissions from the unit are less than 50 percent of the amount required for the source to be classified as a major source, based on an average of the last 3 years, and are expected to remain so.

MINNESOTA POLLUTION CONTROL AGENCY
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PERMIT APPLICATION FORM **GI-09I**
REQUIREMENTS: STATE RULES
10/22/03

Minnesota State Air Quality Rules

Some businesses and activities in Minnesota are subject to the following rules. Read each question to determine if the rule applies to you.

1) Minnesota Air Pollution Episodes
(Minn. R. 7009.1000-7009.1110)

1a) After your facility is permitted, will your facility be allowed to emit more than 250 tons per year of any one of the following pollutants: particulate matter, sulfur dioxide, nitrogen oxides, ozone [volatile organic compounds], carbon monoxide, or non-methane hydrocarbons?

☒ No, my facility is not subject to the Minn. R. 7009.1000-7009.1110.
☐ Yes, my facility is subject to the Minn. R. 7009.1000-7009.1110

2) Minnesota Standards of Performance for Stationary Sources
(Minn. R. ch. 7011)

2a) Does your facility have any equipment that meets the following definition?

"A furnace, boiler or other combustion equipment in Minnesota which burns fossil fuel for the purpose of producing steam, hot water, hot air, or other hot liquid, gas, or solid, where the smoke doesn't have direct contact with the heated medium for which another standard of performance has not been promulgated."

☒ No, my facility **is not** subject to Minn. R. 7011.0500-7011.0550. Go to question 2b.
☐ Yes, my facility **is** subject to Minn. R. 7011.0500-7011.0550. Standards of Performance for Indirect Heating Fossil-Fuel Burning Equipment. (Read the rule to determine the specific requirements that apply to your facility.)

2b) Is your facility type or process equipment found in Table H on pages 6 and 7?

☐ No, none of the Minnesota Rules listed in Table H apply to my facility. Go to question 3.
☒ Yes, my facility or process equipment may be subject to the rule associated with it in Table H. Read the associated rule to see if it applies.

NOTE: the starred performance standards indicate Minnesota Rules that incorporate by reference federal New Source Performance Standards (NSPS) and/or National Emission Standards for Hazardous Air Pollutants (NESHAP). To comply with these state rules, you must comply with the federal NSPS and/or NESHAP.

2c) After reading through Table H and any rule that may apply to your facility or equipment, list the ones that do apply to your air emission source(s) below. You do not need to list the Standards of Performance for Indirect Heating Fossil-Fuel Burning Equipment again, if it applies (see 2a, above).

Minnesota Rule Part that Applies	What the Rule Part Applies to (Whole facility or Specific Piece of Equipment)	Emission Unit ID Number
7011	2350	001
7011	2350	002

(DUPLICATE THIS TABLE AS NEEDED)

3) Minnesota Acid Deposition Control
(Minn. R. 7021.0050)

3a) Does your facility generate electricity?

☐ No. My facility is not subject to Acid Deposition Control Requirements. Go to question 4.
☒ Yes. Go to question 3b.

3b) Does your facility contain indirect heating equipment with a rated heat input of more than 5,000 million BTUs per hour?

☒ No. Go to question 3c.
☐ Yes. My facility is subject to Acid Deposition Control Requirements.

3c) If your facility is an electric utility, is the total generating capacity of all the electric generating facilities in Minnesota which are owned by your facility's parent company more than 1,000 megawatts?

☒ No. My facility is not subject to Acid Deposition Control Requirements.
☐ Yes. My facility is subject to Acid Deposition Control Requirements.

4) Standards of Performance for Industrial Process Equipment
(Minn. R. 7011.0700 - 7011.0735)

4a) Do you have any industrial process equipment on-site that is not regulated by another Standard of Performance (NSPS, NESHAP, or MN Rules Standard of Performance)?

☒ No, my equipment is not subject to this rule. Go to question 5**.**
☐ Yes. Go to 4b.

4b) **Opacity Standard**
(Note: Opacity is a measure of visible emissions or how much of the view is obscured by stack emissions. The emissions causing opacity are often smoke or dust.)

For industrial process equipment which was *in operation before July 9, 1969*, the equipment shall not exhibit greater than 20 percent opacity, except that a maximum of 60 percent opacity shall be permissible for four minutes in any 60 minute period and a maximum of 40 percent opacity shall be permissible for four additional minutes in any 60 minute period.

For industrial process equipment which was *not in operation before July 9, 1969*, the equipment shall not exhibit greater than 20 percent opacity.

4c) Does the industrial process equipment have particulate control equipment with a collection efficiency of at least 99 percent if it was in operation before July 9, 1969, or 99.7 percent if it was not in operation before July 9, 1969?

☐ No. Go to question 4d.
☐ Yes. My equipment is not subject to the remaining requirements of this rule. Go to question 5**.**

4d) Is the industrial process equipment located outside of the seven county Minneapolis-St. Paul metropolitan region AND outside of the city of Duluth AND at least 1/4 mile fromany residence or public roadway, AND does the industrial process equipment have particulate control equipment with a collection efficiency of at least 85 percent AND is the operation of the entire facility in compliance with all ambient air quality standards?

☐ No, my equipment is subject to the remaining requirements. Determine applicable limits using Table I.
☐ Yes, my equipment is not subject to the remaining requirements of this rule. Go to question 5.

5) Waste Combustors
(Minn. Rules 7011.1201-7011.1290)

Note: Depending on the type of waste combustor you operate, you may be instructed to fill out one or more of the following forms:

WC-01 -- Required if you determine that your waste combustor requires a permit.
WC-02 -- Required if you install/operate a Class IV waste combustor at a hospital.
WC-03 -- Required if you do not met the stack height requirements of Minn. R. 7011.1235.

If after reading through the following section, you determine that you are required to fill out one or more of the WC forms, contact the Air Quality Permit Document Coordinator.

5a) Do you operate a waste combustor?

"Waste Combustor" means any emissions unit or emission facility where mixed municipal solid waste, solid waste, or refuse-derived fuel is combusted, and includes incinerators, energy recovery facilities, or other combustion devices. A metals recovery incinerator is a waste combustor. A combustion device combusting primarily wood, or at least 70 percent fossil fuel and wood in combination with up to 30 percent papermill wastewater treatment plant sludge is not a waste combustor. A soil treatment facility, paint burn-off oven, wood heater, or residential fireplace is not a waste combustor.

"Wood" is defined as: wood, wood residue, bark, or any derivative fuel or residue thereof, in any form, including sawdust, sander dust, wood chips, wood scraps, slabs, millings, shavings, and processed pellets made from wood and other forest residues.

A facility that is co-firing RDF or MSW at rates less than 30 percent by weight is not regulated as a waste combustor, but is regulated as a boiler.

☐ Yes, I operate a waste combustor. Answer questions 5b through 5e to determine whether you are allowed to continue to operate, and what type of permit the waste combustor requires. Allowed waste combustors must obtain an air emissions permit.
☒ No, the facility equipment is not subject to this rule. Go to question 6.

5b) Is the waste combustor solely a crematory, pathological or an animal carcass incinerator?

☐ Yes. It is subject to standards of performance in 7011.1215, subp. 3. The waste combustor is an insignificant activity that does not need to be reported. Go to question 6.
☐ No, the facility equipment is not subject to this rule. Go to question 6.

5c) Is the design capacity of the waste combustor equal to or greater than 3 million Btu/hr?

"Design capacity" means: the hourly throughput of the waste combustor unit based on heat input from solid waste to the combustion system as stated by the manufacturer or designer, based on accepted design and engineering practices. For a non-continuous feed system, design capacity means the total heat input from solid waste per cycle.

If you don't have a manufacturer's design capacity in terms of heat input, you may estimate heat input by the following formula:

$$H_{in} = (HHV) \times (R)$$

Where:

H_{in} = Heat input rate
HHV = heat value of waste
R = waste input rate, in lb/hr, as defined by the manufacturer
Commercial/Retail/Institutional Wastes = 7000 Btu/lb
General Industrial Wastes = 9000 Btu/lb
Medical/Infectious Wastes = 10,000 Btu/lb

☐ Yes, the waste combustor has a design capacity of 3 million Btu/hr or greater. The waste combustor is subject to the standards of performance applicable to waste combustors. There are also additional permit application requirements for this unit, as described in Minn. R. 7007.0501, or 7011.1210. Complete form WC-01.

☐ No, the heat input rate is below 3 million Btu/hr. Go to question 5d.

5d) Is the waste combustor used as a metal recover incinerator?

"Metals recovery incinerator" means a furnace or incinerator used primarily to recover precious and non-precious metals by burning the combustible fraction from waste. An aluminum sweat furnace is not a metals recovery incinerator.

☐ Yes. The waste combustor is subject to the standards of performance applicable to waste combustors. There are also additional permit application requirements for this unit, as described in Minn. R. 7007.0501, or 7011.1210. Complete form WC-01.

☐ No. Go to question 5e.

5e) Is the waste combustor located at a hospital?

☐ Yes. The waste combustor is subject to the standards of performance applicable to Class IV waste combustors. There are also additional permit application requirements for this unit, as described in Minn. R. 7007.0501, or 7011.1210. Complete form WC-02 if the waste combustor will comply with all of the design, operating, and standards of performance in parts 7011.1201 to 7011.1290. Otherwise, an air emissions permit must be issued, and you must complete for WC-01. [**Please Note:** There are federal Standards of Performance that must also be met for new sources (see Form GI-09D), and the state will be adopting more stringent standards for existing incinerators by December of 1998.]

☐ No, the waste combustor is not located at a hospital. The operation of this waste combustor was banned after January 30, 1996. Your compliance plan must contain specific steps to cease operation of this waste combustor.

6) Return to Form **GI-09 REQUIREMENTS**, question 11b.

Table H:
Minnesota Standards of Performance for Stationary Sources

Facility or Equipment Type	Associated Minnesota Rule
*Steam Generating Units	7011.0555 through 7011.0570
Direct Heating Equipment	7011.0600 through 7011.0610
*Portland Cement Plants	7011.0800 through 7011.0830
*Asphalt Concrete Plants	7011.0900 through 7011.0925
*Asphalt Processing and Roofing Manufacture	7011.0950
*Grain Elevators	7011.1000 through 7011.1015
Coal Handling Facilities	7011.1100 through 7011.1140
*Coal Preparation Plants	7011.1150
Incinerators (waste combustors)	7011.1201 through 7011.1207
*Sewage Sludge Incinerators	7011.1300 through 7011.1350
*Petroleum Refineries	7011.1400 through 7011.1435, and 7011.7280
*Liquid Petroleum and VOC Storage Vessels	7011.1500 through 7011.1520
*Bulk Gasoline Terminals	7011.1550, 7011.7180
*Sulfuric Acid Plants	7011.1600 through 7011.1635
*Nitric Acid Plants	7011.1700 through 7011.1730
*Lead Smelters	7011.1800 through 7011.1820 and 7011.7240
*Copper Smelters	7011.1840 and 7011.9910
*Zinc Smelters	7011.1880
*Brass and Bronze Plants	7011.1900 through 7011.1920
*Iron and Steel Plants	7011.2000 through 7011.2020
*Primary Aluminum Reduction Plants	7011.2050
*Ferroalloy Production Facilities	7011.2080
Inorganic Fibrous Materials	7011.2100 through 7011.2105
Stationary Internal Combustion Engine (Generators)	7011.2300
*Stationary Gas Turbines	7011.2350
*Phosphate Fertilizer Industry	7011.2400
*Kraft Pulp Mills	7011.2450
*Glass Manufacturing Plants	7011.2500 and 7011.9910
*Surface Coating	7011.2550 through 7011.2580
*Lime Manufacturing Plants	7011.2600
*Lead-acid Battery Manufacturing Plants	7011.2650
*Metallic Mineral Processing Plants	7011.2700
*Phosphate Rock Plants	7011.2750
*Ammonium Sulfate Manufacture	7011.2800
*Graphic Arts Industry	7011.2850
*Synthetic Organic Chemicals Manufacturing Industry	7011.2900 and 7011.7040 through 7011.7060
*Residential Wood Heaters	7011.2950
*Rubber Tire Manufacturing Industry	7011.3000
*Polymer Manufacturing Industry	7011.3050
*Polymeric Coating of Substrates Facilities	7011.3100
*Flexible Vinyl and Urethane Coating and Printing	7011.3150
*Synthetic Fiber Production Facilities	7011.3200
*Petroleum Dry Cleaners	7011.3250
*Onshore Natural Gas Processing Plants	7011.3300
*Non-Metallic Mineral Processing Plants	7011.3350
*Wool Fiberglass Insulation Manufacturing Plants	7011.3400
*Magnetic Tape Manufacturing and Coating Facilities	7011.3450 and 7011.7300

* Denotes Minnesota Rule(s) which incorporate federal NSPS and/or NESHAP requirements by reference.

Table H (continued)

*Municipal Solid Waste Landfills	7011.3500 through 7011.3510
* Emissions from Coke Oven Batteries	7011.7080
* Emissions from Perchloroethylene Dry Cleaners	7011.7100
* Chromium Emissions from and Decorative Chromium Electroplating and Chromium Anodizing Tanks	7011.7120
*Ethylene Oxide Emissions from Sterilization Facilities	7011.7140
* Industrial Process Cooling Towers	7011.7160
*Halogenated Solvent Cleaning	7011.7200
*Epoxy Resins Production and Non-Nylon Polyamides Production	7011.7220
*Marine Tank Vessel Loading Operations	7011.7260
*Aerospace Manufacturing and Rework Facilities	7011.7320
*Arsenic Trioxide and Metallic Arsenic Production Facilities	7011.9910
*Asbestos	7011.9920
*Benzene Emissions	7011.9930
*Beryllium	7011.9940
*Mercury	7011.9950
*Radon	7011.9960
*Radionuclides	7011.9970
*Vinyl Chloride	7011.9980
*Volatile Hazardous Air Pollutants	7011.9990

* Denotes Minnesota Rule(s) which incorporate federal NSPS and/or NESHAP requirements by reference.

TABLE I:
INSTRUCTIONS FOR DETERMINING YOUR PARTICULATE LIMIT

Minnesota has a State rule for the concentration of particulate matter that may be in your exhaust stream. The unit of the standard is grains per dry standard cubic foot. You need to convert your actual exhaust flow to dry standard cubic feet per minute to find the emission limit from the rule.

Sources subject to this rule are required to meet the emission limits established at all times. These limits will vary depending on operating conditions. To determine compliance at any point in time (i.e. for a stack test), follow the steps below:

1. Determine the amount of dry material (subtract any water or moisture content) in pounds per hour that is processed by your equipment.

2. Use Table I.1 to determine your allowed emission rate based on process weight rate. If your process weight rate falls between two values on the table, interpolate or extrapolate using the equation:

$$E = 3.59 \times \left(\frac{P}{2000} \right)^{0.62} \qquad \text{for} \qquad P \leq 60{,}000 \text{ lbs/hour; and:}$$

$$E = 17.31 \times \left(\frac{P}{2000} \right)^{0.16} \qquad \text{for} \qquad P > 60{,}000 \text{ lbs/hour}$$

where:
E = emission rate in lbs/hour; and
P = process weight rate in lbs/hour

3. If your process equipment is vented to the atmosphere, determine the airflow through your stack. Correct to 68 F and 14.7 psi, and correct to remove any moisture in the gas stream to obtain the air flow in dry standard cubic feet per minute (dscfm).

4. Use Table I.2 to determine your allowed concentration in grains per dry standard cubic foot (gr/dscf). Interpolate using the equation:

$$c = 1.7627 \times V^{-0.3241}$$

where:
c = concentration in gr/dscf,
V = gas volume in dscfm

5. Determine which of the two emission rates calculated above is *less stringent*. To convert a concentration (calculated in step 4) to an emission rate (calculated in step 2), use the following equation:

$$E = c \times V \times \left(\frac{60}{7000} \right)$$

where:
E = emission rate in lbs/hour;
c = concentration in gr/dscf,
V = gas volume in dscfm

Table I.1

Process Rate (lbs/hour)	Emission Rate (lbs/hour)
50	0.08
100	0.55
500	1.53
1,000	2.25
5,000	6.34
10,000	9.73
20,000	14.99
60,000	29.60
80,000	31.19
120,000	33.28
160,000	34.85
200,000	36.11
400,000	40.35
1,000,000	46.72

Table I.2

Source Gas Volume (dscfm)	Concentration (gr/dscf)
7,000 or less	0.100
8,000	0.096
9,000	0.092
10,000	0.089
20,000	0.071
30,000	0.062
40,000	0.057
50,000	0.053
60,000	0.050
80,000	0.045
100,000	0.042
120,000	0.040
140,000	0.038
160,000	0.036
180,000	0.035
200,000	0.034
300,000	0.030
400,000	0.027
500,000	0.025
600,000	0.024
800,000	0.021
1,000,000 or more	0.020

Regardless of the allowable emission rates calculated from Tables I.1 and I.2, no process equipment is allowed to emit more than 0.30 grains per standard cubic foot of exhaust gas.

Minnesota Pollution Control Agency

AIR QUALITY
520 LAFAYETTE ROAD
ST. PAUL, MN 55155-4194

PERMIT APPLICATION FORM **IA-01**

INSIGNIFICANT ACTIVITIES (REQUIRED TO BE LISTED)

06/01/04

1) AQ Facility ID No.:

2) Facility Name: Cannon Falls Energy Center

3) Description of Activities: Electric Power Generation

3a)	Rule Citation	**3b)** Description of Activities at the Facility
X	7007.1300, subp. 3(A)	Space Heaters in administration and operation building
☐	7007.1300, subp. 3(B)(1)	
☐	7007.1300, subp. 3(B)(2)	
☐	7007.1300, subp. 3(C)	
☐	7007.1300, subp. 3(D)	
☐	7007.1300, subp. 3(E)(1)	
☐	7007.1300, subp. 3(E)(2)	
☐	7007.1300, subp. 3(F)	
☐	7007.1300, subp. 3(G)	
☐	7007.1300, subp. 3(H)(1)	

3a)	Rule Citation	**3b)** Description of Activities at the Facility
☐	7007.1300, subp. 3(H)(2)	
☐	7007.1300, subp. 3(H)(3)	
☐	7007.1300, subp. 3(H)(4)	
☐	7007.1300, subp. 3(H)(5)	
☐	7007.1300, subp. 3(H)(6)	
☐	7007.1300, subp. 3(H)(7)	
☐	7007.1300, subp. 3(I)	
☐	7007.1300, subp. 3(J)	
☐	7007.1300, subp. 3(K)	
☐	7007.1300, subp. 4	
☐	7008.4100	
☐	7008.4110	

MINNESOTA POLLUTION CONTROL AGENCY
AIR QUALITY
520 LAFAYETTE ROAD
ST. PAUL, MN 55155-4194

PERMIT APPLICATION FORM **CD-01**
COMPLIANCE PLAN
11/18/03

1) AQ Facility ID No.: _____ **2)** Facility Name: **Cannon Falls Energy Center. See Section 5.0 of support document.**

3) ☐ Entire Facility
☐ Individual Items
☐ Grouped Items:
Group ID Number _____
Briefly describe the function of this group:
_____

4)															
Stack/Vent ID Nos.															
Emission Unit ID Nos.															
Tank ID Nos.															
Fugitive Source ID Nos.															
Control Equipment ID Nos.															

5a) Citation	5b) Requirement	5c) Requirement Type (For MPCA Use)
See Section 5.0 of support document.	**See Section 5.0 of support document.**	

MINNESOTA POLLUTION CONTROL AGENCY
AIR QUALITY
520 LAFAYETTE ROAD
ST. PAUL, MN 55155-4194

PERMIT APPLICATION FORM **MI-01**

BUILDING AND STURCTURE INFORMATION

6/16/98

1) AQ Facility ID No.: _____ **2)** Facility Name: Cannon Falls Energy Center

3a) Bldg ID No.	**3b)** Length (ft.)	**3c)** Width (ft.)	**3d)** Roof Height From Ground (ft.)	**3e)** Description / Comments
001	305	108	45	Main Turbine Enclosure
002	36.0	20.0	68.0	Turbine Inlet - Unit #1
003	36.0	20.0	68.0	Turbine Inlet - Unit #2
004	29.5	9.8	46.0	Turbine Bldg Adjacent to Inlet - Unit #1
005	29.5	9.8	46.0	Turbine Bldg Adjacent to Inlet - Unit #2
006	29.5	26.2	33.0	Turbine Bldg Adj. to Stack - Unit #1
007	29.5	26.2	33.0	Turbine Bldg Adj. to Stack - Unit #2
008	62.3	49.2	20.0	O&M Building - North Section

MINNESOTA POLLUTION CONTROL AGENCY
AIR QUALITY
520 LAFAYETTE ROAD
ST. PAUL, MN 55155-4194

PERMIT APPLICATION FORM **MI-01**

BUILDING AND STURCTURE INFORMATION

6/16/98

1) AQ Facility ID No.: _____ **2)** Facility Name: Cannon Falls Energy Center

3a) Bldg ID No.	**3b)** Length (ft.)	**3c)** Width (ft.)	**3d)** Roof Height From Ground (ft.)	**3e)** Description / Comments
009	62.3	49.2	35	O&M Building - South Section
010	88.6	29.5	20.0	M&E Building
011	0.0	0.0	30.0	F.O. Tank - Diameter = 59 feet
012	0.0	0.0	30.0	D.W. Tank - Diameter = 52 feet
013	0.0	0.0	30.0	R.W. Tank - Diameter = 52 feet

APPENDIX B

CUSTOM FUEL MONITORING PLAN

PROPOSED CUSTOM FUEL SAMPLING SCHEDULE

Conditions for Custom Fuel Sampling Schedule for the proposed Stationary Gas Turbines

The proposed combustion turbines will be capable of combusting natural gas and distillate fuel oil.

- Monitoring of Nitrogen Content (40 CFR60.334(b))

  A Monitoring of fuel nitrogen content will not be performed while natural gas is fired in the gas turbine.

  B Monitoring of fuel nitrogen in distillate fuel oil will be accomplished by the distillate fuel oil provider providing in writing the nitrogen content of the distillate fuel oil to Invenergy Cannon Falls. This will be performed for each distillate fuel oil delivery. A record of the distillate fuel oil nitrogen content will be kept on file at the Cannon Falls Energy Center.

- Monitoring of Sulfur Content

  A Analysis for fuel sulfur content of the natural gas will be conducted using one of the approved ASTM reference methods for the measurement of sulfur in gaseous fuels, or an approved alternative method. The reference methods are: ASTM D1072-80; ASTM D3031-81; ASTM D3246-81; and ASTM D4084-82 as referenced in 40 CFR 60.335(b)(2).

  B Effective the date of this custom schedule, sulfur monitoring will be conducted twice monthly for six months. If this monitoring shows little variability in the fuel sulfur content, and indicates consistent compliance with 40 CFR 60.333, then sulfur monitoring will be conducted once per quarter for six quarters.

  C If after monitoring required in item 2(b) above, or herein, the sulfur content of the fuel shows little variability and, calculated as sulfur dioxide, represents consistent compliance with the sulfur dioxide emission limits specified under 40 CFR 60.333, sample analysis will be conducted twice

per annum. This monitoring will be conducted during the first and third quarters of each calendar year.

D Should any sulfur analysis as required in items 2(b) or 2(c) above indicate noncompliance with 40 CFR 60.333, the owner or operator will notify MPCA of such excess emissions and the custom schedule will be re-examined by Invenergy and the MPCA. Sulfur monitoring will be conducted weekly during the interim period when this custom schedule is being re-examined.

E Analysis for fuel sulfur content of the distillate fuel oil will be accomplished by the distillate fuel oil provider providing in writing the sulfur content of the distillate fuel oil to Invenergy Cannon Falls. This will be performed for each distillate fuel oil delivery. A record of the distillate fuel oil sulfur content will be kept on file at the Cannon Falls Energy Center.

- If there is a change in fuel supply, the owner or operator must notify MPCA of such change for re-examination of this custom schedule. A substantial change in fuel quality will be considered as a change in fuel supply. Sulfur monitoring will be conducted weekly during the interim period when this custom schedule is being re-examined.

- Records of sample analysis and fuel supply pertinent to this custom schedule will be retained for a period of three years, and be available for inspection by personnel of federal, state, and local air pollution control agencies.

APPENDIX C

AIR EMISSIONS RISK ANALYSIS (AERA)

TABLE OF CONTENTS

ELECTRONIC FILES FOR AIR EMISSIONS RISK ANALYSIS (AERA)

FILE NAME	DESCRIPTION
Aera-rass-protected.xls	RASS spreadsheets for quantitative analysis
AERA-01 appl.doc	Deliverable Checklist form
AERA-02 appl.doc	Maps form
AERA-03 appl.doc	Dispersion Factor Analysis form
AERA-04 appl.doc	Cert. for Emergency Internal Combustion Engines form
AERA-05 appl.doc	Emissions form
Invtox87.pin & Invtx87b.pin	ISC-PRIME input files: 1, 3, 24, Month, Annual & 8-hour averaging periods for 1987
Invtox87.pou & Invtx87b.pou	ISC-PRIME output files: 1, 3, 24, Month, Annual & 8-hour averaging periods for 1987
Invtox88.pin & Invtx88b.pin	ISC-PRIME input files: 1, 3, 24, Month, Annual & 8-hour averaging periods for 1987
Invtox88.pou & Invtx88b.pou	ISC-PRIME output files: 1, 3, 24, Month, Annual & 8-hour averaging periods for 1987
Invtox89.pin & Invtx89b.pin	ISC-PRIME input files: 1, 3, 24, Month, Annual & 8-hour averaging periods for 1987
Invtox89.pou & Invtx89b.pou	ISC-PRIME output files: 1, 3, 24, Month, Annual & 8-hour averaging periods for 1987
Invtox90.pin & Invtx90b.pin	ISC-PRIME input files: 1, 3, 24, Month, Annual & 8-hour averaging periods for 1987
Invtox90.pou & Invtx90b.pou	ISC-PRIME output files: 1, 3, 24, Month, Annual & 8-hour averaging periods for 1987
Invtox91.pin & Invtx91b.pin	ISC-PRIME input files: 1, 3, 24, Month, Annual & 8-hour averaging periods for 1987
Invtox91.pou & Invtx91b.pou	ISC-PRIME output files: 1, 3, 24, Month, Annual & 8-hour averaging periods for 1987
Invenerg.bpi	BPIP-PRIME Input file
Invenerg.pro	BPIP-PRIME output file

MINNESOTA POLLUTION CONTROL AGENCY
AIR QUALITY
520 LAFAYETTE ROAD
ST. PAUL, MN 55155-4194

AERA-01
DELIVERABLE CHECKLIST

AIR EMISSIONS RISK ANALYSIS
Air Quality #9.01 May 2004

1a) AQ Facility ID No.: _____

1b) AQ File No.: _____

2) Facility Name: Cannon Falls Energy Center

3) Facility Location:

Street Address: _____

City: Cannon Falls State: MN ZIP Code: _____ County: Goodhue

To facilitate review, please provide the following documents, forms or information:

Please submit three hard copies of all AERA submittals including forms and supplemental information, and electronic versions of DISPERSE summary reports/figures and the RASS.

AERA Forms

X	Form AERA-01 Deliverable Checklist (this form)
X	Form AERA-02 Maps Form
X	Form AERA-03 Dispersion Factor Analysis
X	Form AERA-04 Emergency Internal Combustion Engine Certification
X	Form AERA-05 Emissions

Permit Forms - *See Appendix A in the Air Permit Application to Construct*

X	Form GI-01: Facility Information
X	Form GI-02: Process Flow Diagram
X	Form GI-03: Facility and Stack/Vent Diagram
X	Form GI-04: Stack/Vent Information
	Form GI-05D: Fugitive Emission Source Information (if applicable)
X	Form MI-01: Building and Structure Information
X	Form CR-01: Certification of the AERA submittal

Dispersion Submittals (electronic only)

	DISPERSE summary report and summary figures
X	Model input/output if other dispersion modeling used for dispersion factor (e.g. SCREEN3, ISCST3, ISC-PRIME, AERMOD, BPIP, BPIP-PRIME)

Mercury Guidance and Form

	Hg 2003 Assessing the Impacts of Mercury Releases to Ambient Air

MINNESOTA POLLUTION CONTROL AGENCY
AIR QUALITY
520 LAFAYETTE ROAD
ST. PAUL, MN 55155-4194

AERA-01
DELIVERABLE CHECKLIST

AIR EMISSIONS RISK ANALYSIS
Air Quality #9.01 May 2004

RASS Submittals

RASS is based on what type of emission rates? (Check one)

X	Potential to Emit (PTE)
	Future Projected Actuals
	PTE and Future Projected Actuals (i.e., a separate and complete RASS for each)

Assumed receptor location(s): (Check one)

	Two Separate RASS: (1) Chronic (annual) exposure receptors "at or beyond" the fenceline and (2) Acute (maximum 1 hour exposures) on the property
X	One RASS: Chronic and acute exposure receptors located "at or beyond" the fenceline

RASS excludes chemicals of relatively low risk dropped from analysis (Check one)

X	RASS submittal includes all emitted chemicals
	Two submittals: RASS submittal for all emitted chemicals *and* second RASS submittal excluding chemicals previously found to be less than < 10-6 additional cancer risk or < 0.1 hazard quotients

For Modifications (Check one)

	Estimated risks for total facility are greater than risk management thresholds. RASS are provided to characterize the pre-modification (baseline) condition.
	Estimated risks for total facility are below risk management thresholds and no pre-modification (baseline) RASS are needed.

Total Number of RASS submittal(s) ____1____ (electronic only)

Additional information that would facilitate MPCA understanding the assessment or the results.
Please describe any additional attachments in the format below.

Attachment Reference Number (or other identifier)	Title	Purpose
Attachment A	Summary of Criteria Air Pollutant Emissions Associated with 2 Proposed Simple Cycle Combustion Turbines Burning Distillate Fuel Oil	Summarizes the criteria pollutant emissions entered into the emissions tab of the RASS worksheet
Attachment B	Summary of HAPS Associated with Fuel Oil Combustion in the Proposed Simple Cycle Combustion Turbines	Summarizes the HAP emissions entered into the emissions tab of the RASS worksheet

Description of missing information and/or substitutes for the above: _____

ATTACHMENT A

SUMMARY OF CRITERIA AIR POLLUTANT EMISSIONS ASSOCIATED WITH TWO PROPOSED SIMPLE CYCLE COMBUSTION TURBINES BURNING DISTILLATE FUEL OIL INVENERGY CANNON FALLS LLC

DISTILLATE FUEL OIL COMBUSTION

REGULATED AIR POLLUTANT	MAXIMUM EMISSION RATES[1] (LB/HOUR)	OPERATING EMISSIONS [2]		TWO TURBINES (TONS/YR)
		PER TURBINE (LB/HR)	PER TURBINE (TONS/YR)	
SO_2[3]	80.0	76.0	28.6	57.3
NO_X/NO_2	352.0	320.0	120.5	241.1
PM/PM_{10}	34.0	34.0	12.8	25.6
CO	73.0	66.0	24.9	49.7
VOC	8.5	7.3	2.7	5.5
H_2SO_4[3]	10.6	10.1	3.8	7.6
Operation Reduction=	91.4%	753 hours/year		

[1] Maximum hourly emission rates based on 100% operating load and an ambient temperature of -20 degrees F. data provided by the turbine vendor.

[2] Emissions are based on 100% load firing No. 2 distillate fuel oil, 753 hours of operation per year (per turbine), and an ambient temperature of 45 degrees F as provided by the turbine vendor.

[3] The SO_2 emission rate is based on a sulfur content of 0.05% and AP-42, Section 3.1, Table 3.1-2a (April 2000); H_2SO_4 based on 13.3% of the SO_2 emission rate.

ATTACHMENT B

SUMMARY OF HAPS ASSOCIATED WITH FUEL OIL COMBUSTION IN THE PROPOSED SIMPLE CYCLE COMBUSTION TURBINES
INVENERGY CANNON FALLS LLC

		FUEL OIL COMBUSTION		
POLLUTANT	CAS NUMBER	EMISSION FACTOR (lbs/MMBtu)[1]	TOTAL EMISSIONS (2 COMBUSTION TURBINES) (LBS/YEAR)	(TONS/YEAR)
1,3-Butadiene	106-99-0	1.6E-05	**4.33E+01**	**2.16E-02**
Arsenic	7440-38-2	1.1E-05	**2.98E+01**	**1.49E-02**
Benzene	71-43-2	5.5E-05	**1.49E+02**	**7.44E-02**
Beryllium	7440-41-7	3.1E-07	**8.39E-01**	**4.19E-04**
Cadmium	---	4.8E-06	**1.30E+01**	**6.49E-03**
Chromium	7440-47-3	1.1E-05	**2.98E+01**	**1.49E-02**
Formaldehyde	50-00-0	2.8E-04	**7.58E+02**	**3.79E-01**
Lead	7439-92-1	1.4E-05	**3.79E+01**	**1.89E-02**
Manganese	7439-96-5	7.9E-04	**2.14E+03**	**1.07E+00**
Mercury	7439-97-6	1.2E-06	**3.25E+00**	**1.62E-03**
Naphthalene	91-20-3	3.5E-05	**9.47E+01**	**4.74E-02**
Nickel	7440-02-0	4.6E-06	**1.24E+01**	**6.22E-03**
Polycyclic Aromatic Hydrocarbons	---	4.0E-05	**1.08E+02**	**5.41E-02**
Selenium	7446-08-4	2.5E-05	**6.77E+01**	**3.38E-02**
			3,441.9	**1.72**

Notes:

Emissions shown are based on combustion of:	Fuel oil and 753 hours of operation /year
Heat input of one CT based on average ambient conditions (45 deg F and 100% load)=	**1796.0 MMBtu/hour**

[1] Emission Factor Source - AP-42 (April 2000), Stationary Gas Turbines, Section 3.1, Tables 3.1-4 and 3.1-5

MINNESOTA POLLUTION CONTROL AGENCY
AIR QUALITY
520 LAFAYETTE ROAD
ST. PAUL, MN 55155-4194

AERA-02
MAPS

AIR EMISSIONS RISK ANALYSIS
Air Quality #9.02 May 2004

1) AQ Facility ID No.: _____

2) AQ File No.: _____

3) Facility Name: **Cannon Falls Energy Center**

Refer to Section 2 of the application

Maps provide a pictorial representation of information and allow for significant abbreviation of text submittals.

1. Provide a "sensitive population receptor" map of the facility and the surrounding area with the following features. The map should cover a circular area around an emissions facility. At a minimum, the radius of the circle should be 1 km from all emission points. This map should be submitted whether or not "sensitive population receptors" are present.
    a. Facility location
    b. Schools
    c. Daycares
    d. Public recreation areas (could include playgrounds, swimming pools, tennis courts, city parks, etc.)
    e. Nursing homes
    f. Hospitals
    g. Other locations where sensitive receptors congregate

2. Facilities emitting PBTs should provide a map showing the following features:

    a. **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. For facilities with stack heights less than 100 meters, provide a map showing lakes, rivers and streams within a 3 km radius (approx. 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. The length of the reach of river or stream (or extent of a lake) outside the radius that must be shown will be determined case-by-case based on local data and conditions. The map should be labeled to identify the fishable waterbodies.

    b. **Farming locations.** 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 information is provided to the MPCA indicating that the area within a 2-mile radius (6 miles for stack heights greater than 100 meters) is entirely residential (or that it is not and will not be agricultural), only the indirect risks for the resident (which will be lower than the risks to the farmer) will be considered in any risk-based determinations to be made regarding a facility.

MINNESOTA POLLUTION CONTROL AGENCY
AIR QUALITY
520 LAFAYETTE ROAD
ST. PAUL, MN 55155-4194

AERA-03
DISPERSION FACTOR ANALYSIS

AIR EMISSIONS RISK ANALYSIS
Air Quality #9.03 May 2004

1) AQ Facility ID No.: _____

2) AQ File ID No.: _____

1) Facility Name: **Cannon Falls Energy Center**

Purpose
This worksheet is provided to help describe the assumptions made to determine dispersion factors within the air emissions risk evaluation. This worksheet will act as a completeness checklist. If the requested data or forms are not included, please describe why they are not included, and indicate if substitutes are provided.

Information Requested for All Submittals:

1. Does the modeling include any point sources? Yes No

2. Does the modeling include any fugitive sources? Yes No

3. Are all dispersion factors from the DISPERSE Look-Up Table? Yes No

4. Enter the maximum terrain variation (meters) (as applicable):

   a. Within 10m of shortest stack: ____0_____.
   b. Within 100m of shortest stack: ____1_____.
   c. Within 1000m of shortest stack: __40_____.

   d. Within 10m of lowest fugitive source: ____NA_____.
   e. Within 100m of lowest fugitive source: ____NA_____.
   f. Within 1000m of lowest fugitive source: ___NA_____.

5. Stacks/Vents (if applicable)

   a. Are all stacks considered? Yes No
   b. Were any stacks merged? Yes No
   c. Were stacks merged per MPCA DISPERSE guidance? Yes No
   d. Does the shortest modeled stack height in the RASS equal the shortest height on Form GI-04? Yes No

6. Fugitive Emission Sources (if applicable)

   a. Are there any onsite paved roads? Yes No
   b. Are there any onsite unpaved roads? Yes No
   c. Are there any onsite storage/surge piles? Yes No
   d. Are there any onsite material handling operations? Yes No
   e. Are there any other types of onsite fugitive sources? Yes No

   f. Does the modeling consider all onsite fugitive sources? Yes No
   g. Does the modeling consider most onsite fugitive sources? Yes No

7. Stack Parameters (modeled values should match Form GI-04 values unless merged):

Modeled Stacks and Stack Parameters (see example below):

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)
1 001	1	22.86	817	27.77	5.79
2 002	2	22.86	817	27.77	5.79
3					
4					
5					
6					
7					
8					
9					
10					

8. Fugitive Source Release Heights and Area Coverage (if applicable).
   Please indicate in Table 7 if any fugitive/area source was modeled as a point source

Model ID & Form GI-05D FS_ID_No.	RASS Stack ID number	Release Height (meters)	Area Coverage (m^2)	**Brief** Description of Fugitive Source
Not Applicable				
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				

EXAMPLE of Merged and Unmerged Stack Parameters

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): SV001 SV002 SV003		10.0 (lowest of 3 values below) 10.0 11.0 12.0	293 (lowest of 3 values below) 300 310 293	2.5 (lowest of 3 values below) 3.3 2.5 2.7	1.0 (lowest of 3 values below) 1.1 1.1 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

Supplemental Information Requested when using DISPERSE Batch Programs:
Not Applicable

9. Building Data

   a. Circle the Building Profile Input Program (BPIP) option used:
      i. BPIP option 1: MPCA defined "square" structure
      ii. BPIP option 2: User defined "rectangular" structure
      iii. BPIP option 3: pre-existing BPIP file; Filename: _____.
   b. Is the tallest modeled building height greater than or equal to the tallest height on Form MI-01? Yes No

10. Circle the Land Use Land Cover (LULC) option used:

    a. Cultivated land (a.k.a. row crops or cropland; z_o~0.01m to 0.2m);
    b. 50/50 mix of cultivated land and deciduous forest (z_o ~0.3m to 0.8m);
    c. Deciduous forest (and major urban downtown areas) (z_o ~0.5m to 1.3m);
    d. Unknown

11. Does the modeling use five years of meteorological data? Yes No

12. Are all DISPERSE stack locations at the "building" center? Yes No

Supplemental Information Requested when using other modeling (e.g., ISCST3, ISC-PRIME, or AERMOD):

13. Is a CD-ROM included with all modeling input/output files (BPIP; ISCST3 or ISC-PRIME or AERMOD)? Yes No

14. Indicate the model (version number), model options (e.g., DFAULT, CONC, FLAT, ELEV, RURAL, URBAN), and POLLUTID, AVERTIME, MULTYEAR, and HnH selections: __ _Refer to Section 4 of the air permit application to construct. Note that the modeling performed for the RASS worksheet differs from that performed for the permit application in that 1 lb/hr was modeled at all the averaging periods for the RASS worksheet as opposed to actual emission factors used in the permit application modeling. This is the only difference, all other modeling options are the same. Five years were modeled for the RASS and the worst case concentration of the five years for each of the averaging periods was entered into the RASS worksheet. The 8-hour averaging period was modeled in separate input files because no more than 4 averaging periods could be entered into one input file, but the modeling setup is the same for both.

15. Is terrain considered? Yes No If yes, circle DEM data: 1-degree, 7.5 minute, mix, other.

16. Surface meteorological station: Minneapolis/St. Paul____

17. Upper air meteorological station: St. Cloud_____

18. Years of meteorological data: 1987-1991_____

19. Does the modeling calculate high-first-high (H1H) values? Yes No

20. Does the RASS only use H1H values? Yes No

21. Other comments to help understand the modeling (e.g., describe receptor grids, BPIP, etc.): __Refer to Section 4 of the air permit application to construct. __See comments in #14 above.

Supplemental Information Requested (Optional)

22. Do you think this project would significantly benefit from improved dispersion factors? Yes No

23. If 22 is yes, please rank the top 3 items you think would be most helpful:

- Improved stack parameters (height, diameter, temperature, velocity)
- Improved fugitive source information (release height, area coverage)
- Improved general building dimensions
- Improved specific building dimensions
- Improved joint stack/building data (Building Profile Input Program (BPIP) data)

- Fewer merged stacks
- More meteorological options
- More Land Use Land Cover (LCLC) options

- Non-H1H values for short-term criteria pollutants (e.g., H6H 24-hour PM10 values)*

- Terrain options*
- 1.0 degree USGS Digital Elevation Model (DEM) data*
- 7.5 minute USGS Digital Elevation Model (DEM) data*

- Values paired in time*
- Values paired in space*
- Values paired in space & time*

- Facility-specific receptors (e.g., company fence line and/or property line)*
- Source-by-Source impacts (i.e., culpability tables via EVENTFIL option)*

- Other suggestions (list and rank):

_____
_____
_____
_____
_____
_____
_____

* Probably means refined modeling instead of screening modeling.

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AERA-04
CERTIFICATION FOR EMERGENCY INTERNAL COMBUSTION ENGINES

1) AQ Facility ID No.:

2) Facility Name: Cannon Falls Energy Center

This certification must be signed by a responsible official and submitted with any Air Emissions Risk Analysis 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 FOR EMERGENCY INTERNAL COMBUSTION ENGINES

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:

a. 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;

b. 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.

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3) Emission unit description

(Column 1)	IC engine #1	IC engine #2	IC engine #3	IC engine #4	IC engine #5
Stack/Vent No.	004				
Type of Use	Fire Water Pump				
Rated heat input (mmBtu/hr)					
Rated mechanical output (HP and RPM)	290				
Fuel type (include % sulfur)	Diesel				
Fuel consumption rate (gal/hr or cf/hr)	13.5 gal/hr				
Stack height (m)	4.57				
Engine Location[1] UTM coordinates in NAD 1983	506.685 km easting, 4931.208 km northing				
Testing frequency and duration					

4) Additional information (optional)

	IC engine #1	IC engine #2	IC engine #3	IC engine #4	IC engine #5
Stack inside diameter (m)	0.13				
Stack velocity or flow Show units (m/s, m^3/s, or ft^3/min)	15.85 m/s				
Stack temperature (K)	722				
Urban or rural	Rural				
Nearest receptor distance (m)					

* Also refer to Section 2 of air permit application to construct

I also certify, in accordance with Minnesota Rules 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:
Mr./Ms. _____
Title: _____
Signature: _____
Date: _____
Phone: _____

Operator:
Mr./Ms. _____
Title: _____
Signature: _____
Date: _____
Phone: _____

[1] Please provide a facility map, clearly labeling IC engines and their locations.

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AERA-05
EMISSIONS

AIR EMISSIONS RISK ANALYSIS
Air Quality #9.05 May 2004

1) AQ Facility ID No.: _____

2) AQ File ID No.: _____

3) Facility Name: **Cannon Falls Energy Center**

Purpose

The purpose of this form is to describe and document the process used to generate emission rates. The project proposer may choose to assess emissions at the facility's potential to emit (PTE) as defined by state and federal rules. Alternatively, the project proposer may estimate another future operating scenario, defined in AERA as "future estimated actual emissions."

Submittals

Provide answers below or reference attachments.

4) List emission sources at facility that do not have to be quantified *(AERA guide section 2.3.2)* _____
Water Bath Gas Heater
Fire Water Pump

5) Were insignificant activities included? If included, describe assessment. *(AERA Guide Section 2.3.2)* _____
No

6) List of data sources used to generate emission factors: *(AERA Guide section 2.3.3)*
- a. Specific citations of emissions data sources used
  - i. Reference, table number (etc.), publication date
  - ii. Rationale for selecting data sources

Chemical(s)	Reference	Table Number	Date	Rationale
All HAPS	AP-42	Tables 3.1-4 & 3.1-5	4/2000	Recommended source of data per USEPA

7) Description of treatment of data sources in producing the hourly and annual emission rate estimate *(AERA Guide section 2.3.5)* Refer to Attachments A and B, and Section 2.0 of the air permit application to construct. _____

8) Description of operating scenario being assessed, and if estimated future actual, documentation of future business case. *(AERA Guide section 2.3.7)* Refer to Section 2.0 of the air permit application to construct. ___

9) Derivation of operating scenario provided: PTE or future estimated actual emissions. PTE_____

10) If future estimated actual emissions are used, provide business case description to support future case, three years of TRI information for existing facilities, and propose production-based permit limits. _____

11) Determination of Technical and Economic Feasibility. If risk estimates are above risk criteria, a demonstration of technical and economic feasibility must be prepared. *(AERA Guide Section 3.9)* Refer to Section 2.0 and 3.0 of the air permit application to construct _____

APPENDIX D

DISPERSION MODELING FILES

CANNON FALLS ENERGY CENTER
MODELING FILES

FILE NAME	DESCRIPTION
InvPM87.pin	ISC-PRIME PM input file: Annual & 24-hr averaging periods for 1987
InvPM87.pou	ISC-PRIME PM output file: Annual & 24-hr averaging periods for 1987
InvPM88.pin	ISC-PRIME PM input file: Annual & 24-hr averaging periods for 1988
InvPM88.pou	ISC-PRIME PM output file: Annual & 24-hr averaging periods for 1988
InvPM89.pin	ISC-PRIME PM input file: Annual & 24-hr averaging periods for 1989
InvPM89.pou	ISC-PRIME PM output file: Annual & 24-hr averaging periods for 1989
InvPM90.pin	ISC-PRIME PM input file: Annual & 24-hr averaging periods for 1990
InvPM90.pou	ISC-PRIME PM output file: Annual & 24-hr averaging periods for 1990
InvPM91.pin	ISC-PRIME PM input file: Annual & 24-hr averaging periods for 1991
InvPM91.pou	ISC-PRIME PM output file: Annual & 24-hr averaging periods for 1991
InvCO87.pin	ISC-PRIME CO input file: 1 & 8-hour averaging periods for 1987
InvCO87.pou	ISC-PRIME CO output file: 1 & 8-hour averaging periods for 1987
InvCO88.pin	ISC-PRIME CO input file: 1 & 8-hour averaging periods for 1988
InvCO88.pou	ISC-PRIME CO output file: 1 & 8-hour averaging periods for 1988
InvCO89.pin	ISC-PRIME CO input file: 1 & 8-hour averaging periods for 1989
InvCO89.pou	ISC-PRIME CO output file: 1 & 8-hour averaging periods for 1989
InvCO90.pin	ISC-PRIME CO input file: 1 & 8-hour averaging periods for 1990
InvCO90.pou	ISC-PRIME CO output file: 1 & 8-hour averaging periods for 1990
InvCO91.pin	ISC-PRIME CO input file: 1 & 8-hour averaging periods for 1991
InvCO91.pou	ISC-PRIME CO output file: 1 & 8-hour averaging periods for 1991
InvNX87.pin	ISC-PRIME NO_x input file: Annual averaging period for 1987
InvNX87.pou	ISC-PRIME NO_x output file: Annual averaging period for 1987
InvNX88.pin	ISC-PRIME NO_x input file: Annual averaging period for 1988
InvNX88.pou	ISC-PRIME NO_x output file: Annual averaging period for 1988
InvNX89.pin	ISC-PRIME NO_x input file: Annual averaging period for 1989
InvNX89.pou	ISC-PRIME NO_x output file: Annual averaging period for 1989
InvNX90.pin	ISC-PRIME NO_x input file: Annual averaging period for 1990
InvNX90.pou	ISC-PRIME NO_x output file: Annual averaging period for 1990
InvNX91.pin	ISC-PRIME NO_x input file: Annual averaging period for 1991
InvNX91.pou	ISC-PRIME NO_x output file: Annual averaging period for 1991
InvSX87.pin	ISC-PRIME SO_2 input file: Annual, 24 & 3-hour averaging periods for 1987
InvSX87.pou	ISC-PRIME SO_2 output file: Annual, 24 & 3-hour averaging periods for 1987
InvSX88.pin	ISC-PRIME SO_2 input file: Annual, 24 & 3-hour averaging periods for 1988
InvSX88.pou	ISC-PRIME SO_2 output file: Annual, 24 & 3-hour averaging periods for 1988
InvSX89.pin	ISC-PRIME SO_2 input file: Annual, 24 & 3-hour averaging periods for 1989
InvSX89.pou	ISC-PRIME SO_2 output file: Annual, 24 & 3-hour averaging periods for 1989
InvSX90.pin	ISC-PRIME SO_2 input file: Annual, 24 & 3-hour averaging periods for 1990
InvSX90.pou	ISC-PRIME SO_2 output file: Annual, 24 & 3-hour averaging periods for 1990
InvSX91.pin	ISC-PRIME SO_2 input file: Annual, 24 & 3-hour averaging periods for 1991
InvSX91.pou	ISC-PRIME SO_2 output file: Annual, 24 & 3-hour averaging periods for 1991
Invenerg.bpi	BPIP-PRIME Input file
Invenerg.pro	BPIP-PRIME output file