

AIR EMISSION PERMIT NO. 01300098-001

IS ISSUED TO

**Mankato Energy Center, LLC
A Subsidiary of Calpine Corporation**

Mankato Energy Center, LLC
700 Summit Avenue
Mankato, Blue Earth County, MN 56001

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

Permit Type	Application Date	Issue Date	Action Number
Total Facility Operating Permit	12/05/2003	see below	001

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

Permit Type: Federal; Part 70/New Source Review Construction Authorization

Issuance Date: September 29, 2004

Expiration: September 29, 2009

Title I Conditions do not expire.

Richard Sandberg
Air Quality Permits Section Manager
Industrial Division

for Sheryl A. Corrigan
Commissioner
Minnesota Pollution Control Agency

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NOTICE TO THE PERMITTEE:

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

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

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

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

PERMIT SHIELD:

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

FACILITY DESCRIPTION:

The proposed facility is a 630 megawatt electric generating plant. It will be composed of twin Siemens-Westinghouse combined cycle gas turbine generators fired primarily by natural gas. Each gas turbine will be equipped with a heat recovery steam generator and duct burners to supply steam to a common steam turbine electric generator. Each combustion turbine will have the capability of power augmentation through steam injection into the turbine just downstream of the combustor.

The facility will also contain an auxiliary boiler, emergency generator, fire pump engine, fuel oil storage tanks, and a cooling tower.

TABLE A: LIMITS AND OTHER REQUIREMENTS

09/29/04

Facility Name: Mankato Energy Center LLC

Permit Number: 01300098 - 001

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

Subject Item: Total Facility

What to do	Why to do it
OPERATIONAL REQUIREMENTS	hdr
Prohibition of Operation: (a) The issuance of this permit (No. 01300098-001) is related to a modification of the City of Mankato Municipal Wastewater Treatment Plant authorized by NPDES/SDS Permit MN0030171. The Permittee may construct facilities as the law allows and as authorized by permit No. 01300098-001 but may not operate any portion of the facilities and equipment described in permit No. 01300098-001 until NPDES/SDS Permit MN0030171 is issued unless authorized by the Commissioner or unless other lawful means of handling wastewater effluent can be obtained. (continued below)	Minn. R. 7007.0800, subp. 2
(continued from above) (b) Upon the Permittee's written application and showing of good cause, the Commissioner may authorize the Permittee to operate all or a portion of the facilities and equipment governed by permit No. 01300098-001 prior to issuance of NPDES/SDS Permit MN0030171. Economic considerations alone do not constitute good cause. Issuance to Permittee of a separate NPDES permit for the discharge of the facility's wastewater or Permittee's otherwise lawful plan for disposal of the facility's wastewater, as appropriately submitted to the Agency, shall be deemed good cause.	Minn. R. 7007.0800, subp. 2
This source is subject to the U.S. EPA Acid Rain Program codified at 40 CFR Parts 72, 73, and 75. Each combustion turbine and duct burner (EU 001/EU 003 and EU 002/EU 004) is a utility unit that also is a gas-fired unit and a new unit, as defined in 40 CFR Section 72.2. Some of the Acid Rain Program requirements are included in Tables A and B for MPCA tracking purposes. The Permittee's acid rain permit application is in the Appendix of this permit.	40 CFR Parts 72, 73, and 75
Circumvention: Do not install or use a device or means that conceals or dilutes emissions, which would otherwise violate a federal or state air pollution control rule, without reducing the total amount of pollutant emitted.	Minn. R. 7011.0020
Air Pollution Control Equipment: Operate all pollution control equipment whenever the corresponding process equipment and emission units are operated, unless otherwise noted in Table A.	Minn. R. 7007.0800, subp. 2; Minn. R. 7007.0800, subp. 16(J)
Operation and Maintenance Plan: Retain at the stationary source an operation and maintenance plan for all air pollution control equipment. At a minimum, the O & M plan shall identify all air pollution control equipment and shall include a preventative maintenance program for that equipment, a description of (the minimum but not necessarily the only) corrective actions to be taken to restore the equipment to proper operation to meet applicable permit conditions, a description of the employee training program for proper operation and maintenance of the control equipment, and the records kept to demonstrate plan implementation.	Minn. R. 7007.0800, subp. 14 and Minn. R. 7007.0800, subp. 16(J)
Operation Changes: In any shutdown, breakdown, or deviation the Permittee shall immediately take all practical steps to modify operations to reduce the emission of any regulated air pollutant. The Commissioner may require feasible and practical modifications to the operation to reduce emissions of air pollutants. No emissions units that have an unreasonable shutdown or breakdown frequency of process or control equipment shall be permitted to operate.	Minn. R. 7019.1000, subp. 4
Fugitive Emissions: Do not cause or permit the handling, use, transporting, or storage of any material in a manner which may allow avoidable amounts of particulate matter to become airborne. Comply with all other requirements listed in Minn. R. 7011.0150.	Minn. R. 7011.0150
Noise: The Permittee shall comply with the noise standards set forth in Minn. R. 7030.0010 to 7030.0080 at all times during the operation of any emission units. This is a state only requirement and is not enforceable by the EPA Administrator or citizens under the Clean Air Act.	Minn. R. 7030.0010 - 7030.0080
Inspections: The Permittee shall comply with the inspection procedures and requirements as found in Minn. R. 7007.0800, subp. 9(A).	Minn. R. 7007.0800, subp. 9(A)

TABLE A: LIMITS AND OTHER REQUIREMENTS

09/29/04

Facility Name: Mankato Energy Center LLC

Permit Number: 01300098 - 001

The Permittee shall comply with the General Conditions listed in Minn. R. 7007.0800, subp. 16.	Minn. R. 7007.0800, subp. 16
PERFORMANCE TESTING	hdr
Performance Testing: Conduct all performance tests in accordance with Minn. R. ch. 7017 unless otherwise noted in Tables A, B, and/or C.	Minn. R. ch. 7017
Performance Test Notifications and Submittals: Performance Tests are due as outlined in Tables A and B of the permit. See Table B for additional testing requirements. Performance Test Notification (written): due 30 days before each Performance Test Performance Test Plan: due 30 days before each Performance Test Performance Test Pre-test Meeting: due 7 days before each Performance Test Performance Test Report: due 45 days after each Performance Test Performance Test Report - Microfiche Copy: due 105 days after each Performance Test The Notification, Test Plan, and Test Report may be submitted in alternative format as allowed by Minn. R. 7017.2018.	Minn. Rs. 7017.2030, subp. 1-4, 7017.2018 and Minn. R. 7017.2035, subp. 1-2
Limits set as a result of a performance test (conducted before or after permit issuance) apply until superseded as specified by Minn. R. 7017.2025 following formal review of a subsequent performance test on the same unit.	Minn. R. 7017.2025
MONITORING REQUIREMENTS	hdr
Monitoring Equipment Calibration: Calibrate all required monitoring equipment in accordance with manufacturer's recommended calibration procedures when no applicable regulatory requirement specifies calibration procedures and frequency (any requirements applying to continuous emission monitors are listed separately in this permit).	Minn. R. 7007.0800, subp. 4(D)
Operation of Monitoring Equipment: Unless otherwise noted in Tables A, B, and/or C, monitoring a process or control equipment connected to that process is not necessary during periods when the process is shutdown, or during checks of the monitoring systems, such as calibration checks and zero and span adjustments. If monitoring records are required, they should reflect any such periods of process shutdown or checks of the monitoring system.	Minn. R. 7007.0800, subp. 4(D)
RECORDKEEPING	hdr
Recordkeeping: Retain all records at the stationary source for a period of five (5) years from the date of monitoring, sample, measurement, or report. Records which must be retained at this location include all calibration and maintenance records, all original recordings for continuous monitoring instrumentation, and copies of all reports required by the permit. Records must conform to the requirements listed in Minn. R. 7007.0800, subp. 5(A).	Minn. R. 7007.0800, subp. 5(C)
Recordkeeping: Maintain records describing any insignificant modifications (as required by Minn. R. 7007.1250, subp. 3) or changes contravening permit terms (as required by Minn. R. 7007.1350 subp. 2), including records of the emissions resulting from those changes.	Minn. R. 7007.0800, subp. 5(B)
REPORTING/SUBMITTALS	hdr
Shutdown Notifications: Notify the Commissioner at least 24 hours in advance of a planned shutdown of any control equipment or process equipment if the shutdown would cause any increase in the emissions of any regulated air pollutant. If the owner or operator does not have advance knowledge of the shutdown, notification shall be made to the Commissioner as soon as possible after the shutdown. However, notification is not required in the circumstances outlined in Items A, B, and C of Minn. R. 7019.1000, subp. 3. At the time of notification, the owner or operator shall inform the Commissioner of the cause of the shutdown and the estimated duration. The owner or operator shall notify the Commissioner when the shutdown is over.	Minn. R. 7019.1000, subp. 3
Breakdown Notifications: Notify the Commissioner within 24 hours of a breakdown of more than one hour duration of any control equipment or process equipment if the breakdown causes any increase in the emissions of any regulated air pollutant. The 24-hour time period starts when the breakdown was discovered or reasonably should have been discovered by the owner or operator. However, notification is not required in the circumstances outlined in Items A, B, and C of Minn. R. 7019.1000, subp. 2. At the time of notification or as soon as possible thereafter, the owner or operator shall inform the Commissioner of the cause of the breakdown and the estimated duration. The owner or operator shall notify the Commissioner when the breakdown is over.	Minn. R. 7019.1000, subp. 2

TABLE A: LIMITS AND OTHER REQUIREMENTS

09/29/04

Facility Name: Mankato Energy Center LLC

Permit Number: 01300098 - 001

Notification of Deviations Endangering Human Health or the Environment: As soon as possible after discovery, notify the Commissioner or the state duty officer, either orally or by facsimile, of any deviation from permit conditions which could endanger human health or the environment.	Minn. R. 7019.1000, subp. 1
Notification of Deviations Endangering Human Health or the Environment Report: Within 2 working days of discovery, notify the Commissioner in writing of any deviation from permit conditions which could endanger human health or the environment. Include the following information in this written description: 1. the cause of the deviation; 2. the exact dates of the period of the deviation, if the deviation has been corrected; 3. whether or not the deviation has been corrected; 4. the anticipated time by which the deviation is expected to be corrected, if not yet corrected; and 5. steps taken or planned to reduce, eliminate, and prevent reoccurrence of the deviation.	Minn. R. 7019.1000, subp. 1
Application for Permit Amendment: If a permit amendment is needed, submit an application in accordance with the requirements of Minn. R. 7007.1150 through Minn. R. 7007.1500. Submittal dates vary, depending on the type of amendment needed.	Minn. R. 7007.1150 through Minn. R. 7007.1500
Extension Requests: The Permittee may apply for an Administrative Amendment to extend a deadline in a permit by no more than 120 days, provided the proposed deadline extension meets the requirements of Minn. R. 7007.1400, subp. 1(H).	Minn. R. 7007.1400, subp. 1(H)
Emission Inventory Report: due 91 days after end of each calendar year following permit issuance (April 1). Submit the report on a form approved by the Commissioner.	Minn. R. 7019.3000 through Minn. R. 7019.3100
Emission Fees: due 60 days after receipt of an MPCA bill.	Minn. R. 7002.0005 through Minn. R. 7002.0095

TABLE A: LIMITS AND OTHER REQUIREMENTS

09/29/04

Facility Name: Mankato Energy Center LLC

Permit Number: 01300098 - 001

Subject Item: GP 001 Combustion Turbines #1 and #2**Associated Items:** EU 001 Combustion Turbine #1

EU 002 Combustion Turbine #2

What to do	Why to do it
The Following Requirements Apply Individually to Each Combustion Turbine	hdr
<p>Nitrogen Oxides: less than or equal to the value determined by the following equation:</p> $STD = 0.0075 * (14.4/Y) + F$ <p>STD = NOx limit in percent by volume at 15 percent oxygen and on a dry basis Y = manufacturer's rated heat rate at manufacturer's rated load in kilojoules per watt hour, or actual measured heat rate based on lower heating value of fuel as measured at actual peak load, not to exceed 14.4 kilojoules per watt hour F = NOx emission allowance for fuel-bound nitrogen</p> <p>The use of F (fuel-bound nitrogen allowance) is optional.</p>	40 CFR Section 60.332(a)(1)
<p>Sulfur Dioxide: less than or equal to 0.015 percent by volume at 15 percent oxygen and on a dry basis, or</p> <p>Sulfur Content of Fuel: less than or equal to 0.8 percent by weight.</p>	40 CFR Section 60.333
Opacity: less than or equal to 20 percent once operating temperatures have been attained.	Minn. R. 7011.2300, subp. 1
Permitted Fuel Types: Natural gas as defined in 40 CFR Section 72.2, except total sulfur content shall not exceed 0.8 grains/100 scf and the natural gas shall be obtained from a supplier through a pipeline, and distillate fuel oil with a sulfur content not to exceed 0.05% by weight.	Title I Condition: 40 CFR Section 52.21 BACT limit for SO2 and H2SO4; Minn. R. 7007.3000; meets requirements of Minn. R. 7011.2300, subp. 2
Distillate Fuel Oil Operating Hours: less than or equal to 875 hours per year on a 12-month rolling sum basis, for each combustion turbine.	Title I Condition: 40 CFR Section 52.21 BACT limit for SO2 and H2SO4; Minn. R. 7007.3000
<p>Recordkeeping - Fuel Oil Operating Hours: Once each day the Permittee shall calculate and record the number of hours, to the nearest tenth, that each combustion turbine combusted fuel oil, during the previous calendar day.</p> <p>By the last day of each month, the Permittee shall calculate and record the total fuel oil combustion operating hours for each combustion turbine, for the previous calendar month and the previous 12-month period.</p> <p>Separate daily, monthly, and 12-month rolling sum records shall be kept for each combustion turbine.</p>	Title I Condition: 40 CFR Section 52.21 BACT limit for SO2 and H2SO4; Minn. R. 7007.0800, subp. 4 and 5
NOx Monitoring: The Permittee shall use a CEM to measure NOx emissions according to 40 CFR Sections 60.334(d) and (e), or continuously measure the water to fuel or steam to fuel ratio as described in Section 60.334(a).	40 CFR Sections 60.334(d) and (e)
Fuel Monitoring: The Permittee shall follow the applicable fuel sulfur and nitrogen content monitoring requirements in Section 60.334(h) and shall monitor at the frequency specified in 60.334(i).	40 CFR Sections 60.334(h) and (i)
Excess Emission Reports: The Permittee shall submit reports of excess emissions required by Section 60.334(j) with the EER required for SV 001 and SV 002 listed in Table B of this permit.	40 CFR Section 60.334(j)
Performance Testing: The Permittee shall conduct performance testing to measure NOx and SO2, as required by 40 CFR Section 60.335, unless the Permittee obtains approval from the Administrator to use alternate test methods according to Section 60.8(b).	40 CFR Sections 60.8(a) and 60.335

TABLE A: LIMITS AND OTHER REQUIREMENTS

09/29/04

Facility Name: Mankato Energy Center LLC

Permit Number: 01300098 - 001

Subject Item: GP 002 Duct Burners**Associated Items:** EU 003 Duct Burner (Combustion Turbine #1)

EU 004 Duct Burner (Combustion Turbine #2)

What to do	Why to do it
The Following Limits and Operating Requirements Apply Individually to Each Set of Duct Burners for Each Combustion Turbine Generator	hdr
Total Particulate Matter: less than or equal to 0.03 lbs/million Btu heat input except during startup, shutdown, or malfunction.	40 CFR Sections 60.42a(a)(1) and 60.46a(c)
Opacity: less than or equal to 20 percent except for one six-minute period per hour of not more than 27 percent opacity.	40 CFR Sections 60.42a(b)
Sulfur Dioxide: less than or equal to 0.20 lbs/million Btu heat input using 30-day Rolling Average except during startup, shutdown, or malfunction.	40 CFR Sections 60.43a(b)(2) and 60.46a(c)
Nitrogen Oxides: less than or equal to 1.6 lbs/megawatt-hour except during startup, shutdown, or malfunction. This limit is based on a 30-day rolling average except as provided under Section 60.46a(k)(1).	40 CFR Sections 60.44a(d)(1) and 60.46a(c)
Permitted Fuel Type: Natural gas as defined in 40 CFR Section 72.2, except total sulfur content shall not exceed 0.8 grains/100 scf and the natural gas shall be obtained from a supplier through a pipeline.	Title I Condition: 40 CFR Section 52.21 BACT limit for SO ₂ and H ₂ SO ₄ ; Minn. R. 7007.3000
Duct Burner Compliance and Monitoring Provisions: The Permittee shall follow the compliance provisions in 40 CFR Sections 60.46a(k)(1) or 60.46a(k)(2) to determine duct burner compliance with the NO _x limit in Section 60.44a(d)(1). The Permittee shall also follow the additional requirements of 40 CFR Section 60.46a(k)(3) for determining duct burner compliance with the NO _x limit in 40 CFR Section 60.44a(d)(1).	40 CFR Section 60.46a(k)
Performance Testing: The Permittee shall conduct performance testing to measure particulate matter, NO _x , SO ₂ , and opacity, as required by 40 CFR Section 60.48a, unless the Permittee obtains approval from the Administrator to use alternate test methods according to Section 60.8(b).	40 CFR Sections 60.8(a) and 60.48a
Reporting: Follow reporting requirements in Section 60.49a as applicable.	40 CFR Section 60.49a

TABLE A: LIMITS AND OTHER REQUIREMENTS

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Facility Name: Mankato Energy Center LLC

Permit Number: 01300098 - 001

Subject Item: GP 003 Combustion Turbines and Duct Burners (SV 001 & SV 002)

Associated Items: CE 001 Lean Pre-mix DLN Combustion
CE 002 Lean Pre-mix DLN Combustion
CE 003 Steam or Water Injection
CE 004 Steam or Water Injection
CE 005 SCR (Selective Catalytic Reduction)
CE 006 SCR (Selective Catalytic Reduction)
CE 007 Catalytic Oxidizer
CE 008 Catalytic Oxidizer
EU 001 Combustion Turbine #1
EU 002 Combustion Turbine #2
EU 003 Duct Burner (Combustion Turbine #1)
EU 004 Duct Burner (Combustion Turbine #2)
SV 001 Combustion Turbine #1 & Duct Burners #1 Stack
SV 002 Combustion Turbine #2 & Duct Burners #2 Stack

What to do	Why to do it
LIMITS AND OPERATING REQUIREMENTS Limits apply individually to the stack for each combustion turbine generator/duct burner (CTG/DB) except as indicated, and apply regardless if duct burners are operating.	hdr
Nitrogen Oxides: less than or equal to 3.0 parts per million using 3-hour Average by volume on a dry basis corrected to 15% O2 when EU 001/EU 002 combust natural gas without power augmentation. This limit does not apply during startup, shutdown, or malfunction.	Title I Condition: 40 CFR Section 52.21(j) BACT Limit; Minn. R. 7007.3000; meets limit in 40 CFR Section 60.332(a)(1)
Nitrogen Oxides: less than or equal to 3.5 parts per million using 3-hour Average by volume on a dry basis corrected to 15% O2 when EU 001/EU 002 combust natural gas with power augmentation. This limit does not apply during startup, shutdown, or malfunction.	Title I Condition: 40 CFR Section 52.21(j) BACT Limit; Minn. R. 7007.3000; meets limit in 40 CFR Section 60.332(a)(1)
Nitrogen Oxides: less than or equal to 5.5 parts per million using 3-hour Average by volume on a dry basis corrected to 15% O2 when EU 001/EU 002 combust distillate fuel oil. This limit does not apply during startup, shutdown, or malfunction.	Title I Condition: 40 CFR Section 52.21(j) BACT Limit; Minn. R. 7007.3000; meets limit in 40 CFR Section 60.332(a)(1)
Carbon Monoxide: less than or equal to 4.0 parts per million using 3-hour Average by volume on a dry basis corrected to 15% O2. This limit applies at all times when EU 001/EU 002 combust natural gas and operate at full load. This limit does not apply during startup, shutdown, or malfunction.	Title I Condition: 40 CFR Section 52.21(j) BACT Limit; Minn. R. 7007.3000
Carbon Monoxide: less than or equal to 4.7 parts per million using 3-hour Average by volume on a dry basis corrected to 15% O2. This limit applies at all times when EU 001/EU 002 combust natural gas and operate at less than full load or while operating with power augmentation. This limit does not apply during startup, shutdown, or malfunction.	Title I Condition: 40 CFR Section 52.21(j) BACT Limit; Minn. R. 7007.3000
Carbon Monoxide: less than or equal to 4.8 parts per million using 3-hour Average by volume on a dry basis corrected to 15% O2 when EU 001/EU 002 combust distillate fuel oil and operate at full load. This limit does not apply during startup, shutdown, or malfunction.	Title I Condition: 40 CFR Section 52.21(j) BACT Limit; Minn. R. 7007.3000
Carbon Monoxide: less than or equal to 10.2 parts per million using 3-hour Average by volume on a dry basis corrected to 15% O2 when EU 001/EU 002 combust distillate fuel oil and operate at less than full load. This limit does not apply during startup, shutdown, or malfunction.	Title I Condition: 40 CFR Section 52.21(j) BACT Limit; Minn. R. 7007.3000
Volatile Organic Compounds: less than or equal to 3.4 parts per million using 3-hour Average by volume on a dry basis corrected to 15% O2 when EU 001/EU 002 combust natural gas without power augmentation. This limit applies at all times except during startup, shutdown, or malfunction.	Title I Condition: 40 CFR Section 52.21(j) BACT Limit; Minn. R. 7007.3000
Volatile Organic Compounds: less than or equal to 7.4 parts per million using 3-hour Average by volume on a dry basis corrected to 15% O2 when EU 001/EU 002 combust natural gas with power augmentation. This limit applies at all times except during startup, shutdown, or malfunction.	Title I Condition: 40 CFR Section 52.21(j) BACT Limit; Minn. R. 7007.3000
Volatile Organic Compounds: less than or equal to 7.1 parts per million using 3-hour Average by volume on a dry basis corrected to 15% O2 when EU 001/EU 002 combust distillate fuel oil. This limit applies at all times except during startup, shutdown, or malfunction.	Title I Condition: 40 CFR Section 52.21(j) BACT Limit; Minn. R. 7007.3000

TABLE A: LIMITS AND OTHER REQUIREMENTS

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Facility Name: Mankato Energy Center LLC

Permit Number: 01300098 - 001

Total Particulate Matter: less than or equal to 0.009 lbs/million Btu heat input and not to exceed 22.0 lb/hr, both on a 3-hour average, when combusting natural gas in EU 001/EU 002. This limit applies at all times except during startup, shutdown, or malfunction.	Title I Condition: 40 CFR Section 52.21(j) BACT Limit; Minn. R. 7007.3000
Total Particulate Matter: less than or equal to 0.057 lbs/million Btu heat input and not to exceed 72.8 lb/hr, both on a 3-hour average, when combusting distillate fuel oil in EU 001/EU 002. This limit applies at all times except during startup, shutdown, or malfunction.	Title I Condition: 40 CFR Section 52.21(j) BACT Limit; Minn. R. 7007.3000
Particulate Matter < 10 micron: less than or equal to 0.009 lbs/million Btu heat input and not to exceed 22.0 lb/hr, both on a 3-hour average, when combusting natural gas in EU 001/EU 002. This limit applies at all times except during startup, shutdown, or malfunction.	Title I Condition: 40 CFR Section 52.21(j) BACT Limit; Minn. R. 7007.3000
Particulate Matter < 10 micron: less than or equal to 0.057 lbs/million Btu heat input and not to exceed 72.8 lb/hr, both on a 3-hour average, when combusting distillate fuel oil in EU 001/EU 002. This limit applies at all times except during startup, shutdown, or malfunction.	Title I Condition: 40 CFR Section 52.21(j) BACT Limit; Minn. R. 7007.3000
Sulfur Dioxide: less than or equal to 0.8 grains of sulfur/100 standard cubic feet of natural gas on a calendar year average. This limit applies at all times including startup, shutdown, and malfunction. This limit is equivalent to 0.0022409 lb SO ₂ /mmBtu @1020 Btu/scf.	Title I Condition: 40 CFR Section 52.21 BACT limit for SO ₂ and H ₂ SO ₄ ; Minn. R. 7007.3000
Sulfur Content of Fuel: less than or equal to 0.05 percent by weight for No. 2 distillate fuel oil. This limit applies at all times including startup, shutdown, and malfunction.	Title I Condition: 40 CFR Section 52.21 BACT limit for SO ₂ and H ₂ SO ₄ ; Minn. R. 7007.3000
n-Hexane: less than or equal to 9.0 tons per year on a 12-month rolling sum, regardless of fuel type. This limit applies to the total emissions from SV 001 and SV 002, and at all times including startup, shutdown, and malfunction.	Title I Condition: To limit single HAP emissions to less than the major source level in 40 CFR Section 63.2
Formaldehyde: less than or equal to 9.0 tons/year using 12-month Rolling Sum regardless of fuel type. This limit applies to the total emissions from SV 001 and SV 002, and at all times including startup, shutdown, and malfunction.	Title I Condition: To limit single HAP emissions to less than the major source level in 40 CFR Section 63.2
HAPs - Total: less than or equal to 22.5 tons/year using 12-month rolling sum. This limit applies to the total emissions from SV 001 and SV 002, and at all times including startup, shutdown, and malfunction.	Title I Condition: To limit total HAP emissions to less than the major source level in 40 CFR Section 63.2
The Permittee shall operate each CTG/DB (EU 001/EU 003 and EU 002/EU 004) in a manner consistent with good combustion practices to restrict emissions of PM, PM ₁₀ , CO, and VOC.	Title I Condition: 40 CFR Section 52.21(j) BACT operating condition to limit PM, PM ₁₀ , VOC, and CO; Minn. R. 7007.3000
The Permittee shall restrict startup and shutdown operation for each CTG/DB (EU 001/EU 003 and EU 002/EU 004) to the shortest time period possible to restrict emissions of PM, PM ₁₀ , NO _x , CO, and VOC.	Title I Condition: 40 CFR Section 52.21(j) BACT operating condition to limit PM, PM ₁₀ , VOC, and CO; Minn. R. 7007.3000
EU 001 and EU 002 Startup, Shutdown, and Malfunction: The terms "startup", "shutdown", and "malfunction" shall have the same meanings as defined in 40 CFR Section 60.2. For the purposes of this permit, operation in startup and shutdown mode is limited as follows: Startup shall not exceed 60 minutes if the steam turbine-generator was off-line less than 8 consecutive hours; 95 minutes if the steam turbine-generator was off-line for 8 to 48 consecutive hours; and 185 minutes if the steam turbine-generator was off-line more than 48 consecutive hours. Shutdown shall not exceed 25 minutes. On-line operational periods of less than 60 minutes duration shall be considered offline for startup determination purposes.	Title I Condition: 40 CFR Section 52.21(j) BACT Limit; Minn. R. 7007.3000
EU 001 and EU 002 Operating Modes: 1. Startup and Shutdown Operating Mode is all operation of EU 001 or EU 002 at less than 60 percent of the CTG maximum potential load based on ambient conditions at the time of operation when combusting natural gas or distillate fuel oil; 2. Normal Operating Mode is all operation of EU 001 or EU 002 at 60 percent or greater of the CTG maximum potential load based on ambient conditions at the time of operation when combusting natural gas or distillate fuel oil. The CEMS data acquisition and handling system monitors EU 001/EU 002 load (using a signal provided by the CTG control system) and indicates whether EU 001/EU 002 is operating in normal mode or startup/shutdown mode. The percent load signal is also used by the CEMS to determine whether emissions data is categorized as normal emissions data or startup/shutdown emissions data.	Minn. R. 7007.0800, subp. 2

TABLE A: LIMITS AND OTHER REQUIREMENTS

09/29/04

Facility Name: Mankato Energy Center LLC

Permit Number: 01300098 - 001

Control Equipment Operation During Startup and Shutdown: Operation of CE 001, CE 003, CE 005, and CE 007 is not required during EU 001 startup, and operation of CE 002, CE 004, CE 006, and CE 008 is not required during EU 002 startup. During shutdown, control equipment operation shall continue as long as is physically possible.	Minn. R. 7007.0800, subp. 2
CLEAN UNIT DESIGNATION REQUIREMENTS	hdr
<p>EU 001 & EU 003 Clean Unit Designation for NOx:</p> <p>1. Use of CE 001 (lean pre-mix dry low NOx combustion) and CE 005 (selective catalytic reduction with ammonia injection) for NOx control qualifies EU 001 as a Clean Unit for NOx when combusting natural gas, provided the Permittee complies with the provisions of 40 CFR Section 52.21(x);</p> <p>2. Use of CE 003 (water/steam injection) and CE 005 for NOx control qualifies EU 001 as a Clean Unit for NOx when combusting distillate fuel oil, provided the Permittee complies with the provisions of 40 CFR Section 52.21(x);</p> <p>3. Use of CE 005 for NOx control qualifies EU 003 as a Clean Unit for NOx, provided the Permittee complies with the provisions of 40 CFR Section 52.21(x).</p>	Title I Condition: 40 CFR Sections 52.21 (x)(3)(ii) and (x)(6)(i)
<p>EU 001 & EU 003 Clean Unit Designation for CO and VOC:</p> <p>Use of CE 007 (catalytic oxidation) for CO and VOC control qualifies EU 001 as a Clean Unit for CO and VOC when combusting natural gas or fuel oil, and EU 003 as a Clean Unit for CO and VOC when combusting natural gas, provided the Permittee complies with the provisions of 40 CFR Section 52.21(x).</p>	Title I Condition: 40 CFR Sections 52.21 (x)(3)(ii) and (x)(6)(i)
<p>EU 002 & EU 004 Clean Unit Designation for NOx:</p> <p>1. Use of CE 002 (lean pre-mix dry low NOx combustion) and CE 006 (selective catalytic reduction with ammonia injection) for NOx control qualifies EU 002 as a Clean Unit for NOx when combusting natural gas, provided the Permittee complies with the provisions of 40 CFR Section 52.21(x);</p> <p>2. Use of CE 004 (water/steam injection) and CE 006 for NOx control qualifies EU 002 as a Clean Unit for NOx when combusting distillate fuel oil, provided the Permittee complies with the provisions of 40 CFR Section 52.21(x);</p> <p>3. Use of CE 006 for NOx control qualifies EU 004 as a Clean Unit for NOx, provided the Permittee complies with the provisions of 40 CFR Section 52.21(x).</p>	Title I Condition: 40 CFR Sections 52.21 (x)(3)(ii) and (x)(6)(i)
<p>EU 002 & EU 004 Clean Unit Designation for CO and VOC:</p> <p>Use of CE 008 (catalytic oxidation) for CO and VOC control qualifies EU 002 as a Clean Unit for CO and VOC when combusting natural gas or fuel oil, and EU 004 as a Clean Unit for CO and VOC when combusting natural gas, provided the Permittee complies with the provisions of 40 CFR Section 52.21(x).</p>	Title I Condition: 40 CFR Sections 52.21 (x)(3)(ii) and (x)(6)(i)
<p>Effective Date of Clean Unit Designation for NOx, CO, and VOC: The effective date is the earlier of three years after the issuance date of this permit or the date on which the following sets of control equipment are placed into service for the respective emission units:</p> <p>1. EU 001 & EU 003: a. CE 001, CE 003, and CE 005 for NOx control b. CE 007 for CO and VOC control</p> <p>2. EU 002 & EU 004: a. CE 002, CE 004, and CE 006 for NOx control b. CE 008 for CO and VOC control</p> <p>The Permittee shall indicate the date that each piece of control equipment is placed into service in the 'Notification of Actual Date of Initial Startup' notification requirement for EU 001 & EU 003, and EU 002 & EU 004 in 'Table B: One Time Submittals Or Notifications'.</p>	Title I Condition: 40 CFR Section 52.21(x)(4)(i)
<p>Expiration Date for Clean Unit Designation for NOx, CO, and VOC: The expiration date is the earlier of ten years after the effective date, or ten years after CE 001/CE 003/CE 005 and CE 007, and CE 002/CE 004/CE 006 and CE 008 went into service. In addition, the Clean Unit designation expires any time the Permittee fails to comply with the provisions for maintaining the Clean Unit designation in 40 CFR Section 52.21(x)(7).</p>	Title I Condition: 40 CFR Section 52.21(x)(5)(i)

TABLE A: LIMITS AND OTHER REQUIREMENTS

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Facility Name: Mankato Energy Center LLC

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<p>Basis for Clean Unit Designation for NOx: In addition to the SV 001 and SV 002 NOx BACT limits contained in this permit, the following parameters formed the basis for the clean unit designation:</p> <ol style="list-style-type: none"> Fuel and Heat Input Capacities for each combustion turbine (EU 001/EU 002): <ol style="list-style-type: none"> 1.878 mmcf natural gas/hour @ 1020 Btu/cf & 1916 mmBtu/hr heat input capacity @ 44F without power augmentation; 2.085 mmcf natural gas/hour @ 1020 Btu/cf & 2044 mmBtu/hr heat input capacity @ 48F with power augmentation; 13050 gallons distillate fuel oil/hour @ 140,000 Btu/gal & 1827 mmBtu/hr heat input capacity @ 44F; Fuel and Heat Input Capacities for each duct burner (EU 003/EU 004) of 0.7843 mmcf/hr @ 1020 mmBtu/hr and 800 mmBtu/hr; Use of SCR with dry low NOx combustion when combusting natural gas; Use of SCR with water/steam injection when combusting fuel oil; Restriction of startup and shutdown operation to the shortest time period possible. 	Title I Condition: 40 CFR Section 52.21(x)(6)(iv)
<p>Basis for Clean Unit Designation for CO and VOC: In addition to the SV 001 and SV 002 CO and VOC BACT limits contained in this permit, the following parameters formed the basis for the clean unit designation:</p> <ol style="list-style-type: none"> Fuel and Heat Input Capacities for each combustion turbine (EU 001/EU 002): <ol style="list-style-type: none"> 1.878 mmcf natural gas/hour @ 1020 Btu/cf & 1916 mmBtu/hr heat input capacity @ 44F without power augmentation; 2.085 mmcf natural gas/hour @ 1020 Btu/cf & 2044 mmBtu/hr heat input capacity @ 48F with power augmentation; 13050 gallons distillate fuel oil/hour @ 140,000 Btu/gal & 1827 mmBtu/hr heat input capacity @ 44F; Fuel and Heat Input Capacities for each duct burner (EU 003/EU 004) of 0.7843 mmcf/hr @ 1020 mmBtu/hr and 800 mmBtu/hr; Use of an Oxidation Catalyst when combusting natural gas or distillate fuel oil; Restriction of startup and shutdown operation to the shortest time period possible. 	Title I Condition: 40 CFR Section 52.21(x)(6)(iv)
<p>Maintaining Clean Unit Designation for NOx, CO, and VOC: To maintain the Clean Unit Designation for NOx, CO, and VOC the Permittee must conform to all the restrictions listed in 40 CFR Section 52.21(x)(7). Failure to do so results in EU 001/EU 003 and/or EU 002/EU 004 losing this Clean Unit Designation.</p>	Title I Condition: 40 CFR Section 52.21(x)(7)
MONITORING REQUIREMENTS	hdr
<p>Emissions Monitoring: The Permittee shall measure or calculate SO₂, NO_x, and CO₂ emission rates for each affected unit in accordance with 40 CFR Section 75.</p>	40 CFR Section 75.10
<p>Emissions Monitoring: The Permittee shall use a Continuous Emissions Monitoring System (CEMS) to measure NO_x emissions, and measure or calculate SO₂ and CO₂ in accordance with 40 CFR Part 75 for each stack in GP 003. The Permittee shall measure NO_x emissions in ppmvd corrected to 15% oxygen and automatically calculate and record the 3-hour average NO_x emission rate. NO_x ppmvd emission data shall also be converted to lb/mmBtu as required by part 75.</p>	Title I Condition: Monitoring for 40 CFR Section 52.21(j) NO _x BACT limit; 40 CFR Section 75.10
<p>Emissions Monitoring: The owner or operator shall use a CEMS to measure CO emissions in ppmvd corrected to 15% oxygen. The Permittee shall automatically calculate and record the 3-hour average CO emission rate.</p>	Title I Condition: Monitoring for 40 CFR Section 52.21(j) CO BACT limit
<p>Operating Load and Operating Conditions Monitoring: The Permittee shall:</p> <ol style="list-style-type: none"> continuously monitor, determine, and record the hourly heat input rate (mmBtu/hr) for EU 0001/EU 003 and EU 0002/EU 004 using the methods specified at 40 CFR Part 75, Appendix D Section 3.4; monitor and record the time and duration of each use of power augmentation; monitor and record the time and duration of each startup, shutdown, and malfunction; record the start and stop time of each steam turbine-generator on-line and off-line period. monitor and record the percent operating load (using the combustion turbine automated control system and the CEMS data acquisition and handling system). 	Title I Condition: Monitoring for 40 CFR Section 52.21(j) BACT limits and to limit HAP emissions to less than the major source levels in 40 CFR Section 63.2; Minn. R. 7007.0800, subp. 4

TABLE A: LIMITS AND OTHER REQUIREMENTS

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<p>Daily HAPs Monitoring: Once each day, the Permittee shall calculate and record the formaldehyde, n-hexane, and total HAPs emissions for each CTG/DB based on the applicable emission factor and hourly heat input records for the previous operating day.</p> <p>The applicable emission factor is:</p> <ol style="list-style-type: none"> 1. the emission factor for formaldehyde and n-hexane determined during the most recent MPCA-approved and reviewed stack test; 2. prior to initial formaldehyde and n-hexane testing, the applicable emission shall be the appropriate factor for gas turbines and natural gas-fired boilers (for the duct burners) from the current version of AP-42; 2. for all other HAPs, the applicable emission factor shall be the appropriate factor from the current version of AP-42. 	<p>Title I Condition: Monitoring to limit HAP emissions to less than the major source levels in 40 CFR Section 63.2; Minn. R. 7007.0800, subp. 4</p>
<p>Monthly HAPs Emissions Recordkeeping: by the last day of each month, the Permittee shall calculate and record the monthly formaldehyde, n-hexane, and total HAPs emissions data for the previous calendar month, based on daily emissions data.</p>	<p>Minn. R. 7007.0800, subp. 4</p>
<p>Load-Dependent Formaldehyde and n-Hexane Emission Factors: After determining emission factors by performance testing, the Permittee shall determine actual formaldehyde and n-hexane emissions by using the appropriate fuel-specific and operating conditions-specific factor as follows:</p> <ol style="list-style-type: none"> 1. the formaldehyde factor based on testing at 15 to 30 percent load shall be used for all operation less than 60 percent load; 2. the formaldehyde factor based on testing at 60 to 70 percent load shall be used for all operation from 60 to 90 percent load; 3. the formaldehyde and n-hexane factors based on testing at 90 to 100 percent load shall be used for all operation above 90 percent load. 	<p>Minn. R. 7007.0800, subp. 4</p>
<p>The HAPs calculation and recordkeeping requirements listed above shall not apply to SV 001 and SV 002 if all of the following requirements are met:</p> <ol style="list-style-type: none"> 1. MPCA-approved performance tests for formaldehyde emissions demonstrate that combined SV 001 and SV 002 formaldehyde emission rates are less than or equal to 2.0 lbs/hr at all test loads; 2. MPCA-approved performance tests for n-hexane emissions demonstrate that combined SV 001 and SV 002 n-hexane emission rates are less than or equal to 2.0 lbs/hr at all test loads; 3. The calculated total HAPs would be less than 4.5 lb/hr combined from SV 001 and SV 002, using formaldehyde and n-hexane performance test data and AP-42 emission factors for HAPs that are not tested. 	<p>Title I Condition: Monitoring to limit HAP emissions to less than the major source levels in 40 CFR Section 63.2; Minn. R. 7007.0800, subp. 4</p>
<p>CONTINUOUS EMISSIONS MONITORING (CEM) REQUIREMENTS</p> <p>CO CEM requirements apply individually to the CO CEM system on each stack. NOx CEM requirements apply individually to the NOx CEM system on each stack.</p>	<p>hdr</p>
<p>Installation Notification: due 60 days before installing any continuous emissions monitoring system.</p>	<p>Minn. R. 7017.1040, subp. 1</p>
<p>CO CEMS Certification Test: due within 90 days after the due-date of the first excess emissions report required for the CO CEMS. Follow the Performance Specifications listed in 40 CFR part 60, Appendix B.</p>	<p>Minn. R. 7017.1050, subp. 1</p>
<p>NOx CEMS Certification Test: due in accordance with 40 CFR Section 75.4(b). Certify all CEMS required by the Acid Rain Program in accordance with 40 CFR part 75, Appendix A.</p>	<p>40 CFR Section 75.4(b)</p>
<p>NOx and CO CEMS Certification Test Plans: due 45 days before the corresponding CEMS Certification Test.</p>	<p>40 CFR Section 75.62; 40 CFR Section 75.20; Minn. R. 7017.1060, subps. 1 & 2</p>
<p>NOx and CO CEMS Certification Test Pretest Meeting: due 7 days the corresponding CEMS Certification Test.</p>	<p>Minn. R. 7017.1060, subp. 3</p>
<p>NOx and CO CEMS Certification Test Reports: due 45 days after the corresponding CEMS Certification Test.</p>	<p>40 CFR Section 75.63; Minn. R. 7017.1080, subp. 2</p>
<p>NOx and CO CEMS Certification Test Report - Microfiche Copy: due 105 days after the corresponding CEMS Certification Test. This report may be submitted in alternate format such as CD-ROM, as allowed by Minn. R. 7017.1120, subp. 2.</p>	<p>Minn. R. 7017.1080, subp. 3 and 7017.1120, subp. 2</p>
<p>NOx CEMS Quality Assurance/Quality Control (QA/QC): The Permittee shall operate, calibrate, and maintain the NOx CEMS according to the QA/QC procedure in 40 CFR part 75, Appendix B, as amended.</p>	<p>40 CFR Section 75.21</p>

TABLE A: LIMITS AND OTHER REQUIREMENTS

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NOx CEMS and CO CEMS Continuous Operation: The NOx CEMS and CO CEMS must be operated and data recorded during all periods of emission unit operation including periods of emission unit start-up, shutdown, or malfunction except for periods of acceptable monitor downtime. This requirement applies whether or not a numerical emission limit applies during these periods. The CEMS must not be bypassed except in emergencies where failure to bypass would endanger human health, safety, or plant equipment.	Minn. R. 7017.1090, subp. 1
Acceptable CEM downtime includes reasonable periods as listed in items A, B, C and D of Minn. R. 7017.1090, subp. 2.	
NOx CEMS Daily Calibration Error (CE) Test: Conduct daily CE testing on the NOx CEMS in accordance with 40 CFR part 75, Appendix B.	40 CFR part 75, Appendix B, section 2.1
CO CEMS Daily Calibration Drift (CD) Test: The CD shall be quantified and recorded at zero (low-level) and upscale (high-level) gas concentrations at least once daily. The CO CEMS shall be adjusted whenever the CD exceeds twice the specification of 40 CFR part 60, Appendix B. 40 CFR part 60, Appendix F shall be used to determine out-of-control periods for the CO CEMS. Follow the procedures in 40 CFR part 60, Appendix F.	Minn. R. 7017.1170, subp. 3
Linearity and Leak Check Test (Acid Rain Program): due before end of each calendar quarter following CEM Certification Test. Conduct a quarterly linearity test on the NOx CEMS in accordance with 40 CFR part 75, Appendix B.	40 CFR part 75, Appendix B, section 2.2
NOx CEMS Linearity Test Results Summary: due 30 days after end of each calendar quarter following Linearity and Leak Check Test if performed.	Minn. R. 7017.1180, subp. 4
CEMS Relative Accuracy Test Audit (RATA): due before end of each year following CEM Certification Test. Conduct a NOx CEMS RATA, in accordance with 40 CFR part 75, Appendix B. If the RATA results indicate a relative accuracy of 7.5% or less, the next RATA is not required for twelve months.	40 CFR part 75, Appendix B, section 2.3
CO CEMS Relative Accuracy Test Audit (RATA): due before end of each calendar year following CO CEMS Certification Test. If the relative accuracy is 15% or less the next CO CEMS RATA is not due for 24 months. Follow the procedures in 40 CFR part 60, Appendices B and F.	Minn. R. 7017.1170, subp. 5
NOx and CO CEMS Relative Accuracy Test Audit (RATA) Notification: due 30 days before the corresponding CEMS RATA.	Minn. R. 7017.1180, subp. 2
NOx and CO CEMS Relative Accuracy Test Audit (RATA) Results Summary: due 30 days after end of each calendar quarter in which the corresponding CEMS RATA was conducted.	Minn. R. 7017.1180, subp. 3
CO CEMS Cylinder Gas Audit (CGA): due before end of each calendar half-year following CEMS Certification Test. Conduct CGA at least 3 months apart and not greater than 8 months apart. Follow the procedures in 40 CFR part 60, Appendix F.	Minn. R. 7017.1170, subp. 4
CO CEMS Cylinder Gas Audit (CGA) Results Summary: due 30 days after end of each calendar half-year following CGA.	Minn. R. 7017.1180, subp. 1
Recordkeeping: The owner or operator must retain records of all CEMS monitoring data and support information for a period of five years from the date of the monitoring sample, measurement or report. Records shall be kept at the source.	Minn. R. 7017.1130; 40 CFR Section 75.50
COMPLIANCE ASSURANCE MONITORING (CAM) REQUIREMENTS	hdr
NOx and CO CAM Requirements: The Permittee shall use the CO CEMS and NOx CEMS to satisfy the requirements of 40 CFR part 64.	40 CFR Section 64.3(d)
VOC CAM Requirements: The Permittee shall use the CO CEMS for VOC compliance assurance monitoring. Compliance with the CO limit indicated by the CO CEMS assures that VOC emissions are in compliance with the VOC limit.	40 CFR Sections 64.3(a) and 64.6(b)
The Permittee shall demonstrate this correlation by recording and comparing CO CEMS emissions data during VOC performance testing of SV 001 and SV 002, with results of the VOC testing. The correlation shall be valid only if testing demonstrates that VOC emissions comply with the applicable VOC limit at the same time that CO emissions (measured by the CO CEMS) comply with the applicable CO limit, and the CO CEMS certification testing has been satisfactorily completed.	
PERFORMANCE TESTING REQUIREMENTS	hdr
Initial Performance Test: due 180 days after Startup but no later than 60 days after achieving the maximum production rate, to measure NOx emissions. Separate tests shall be conducted while combusting natural gas with power augmentation, and while combusting distillate fuel oil. Tests shall be conducted according to the requirements of 40 CFR Sections 60.8(b), 60.8(c), and 60.335(c).	Title I Condition: to measure NOx emissions subject to a 40 CFR Section 52.21(j) BACT limits; Minn. R. 7017.2020, subp. 1;
Initial Performance Test: due 180 days after Startup but no later than 60 days after achieving the maximum production rate, to measure SO2 emissions. Separate tests shall be conducted while combusting natural gas with power augmentation, and while combusting distillate fuel oil. Tests shall be conducted according to the requirements of 40 CFR Sections 60.8(b), 60.8(c), and 60.335(c).	Title I Condition: to measure SO2 emissions subject to a 40 CFR Section 52.21(j) BACT limits; Minn. R. 7017.2020, subp. 1; meets requirements in 40 CFR Sections 60.48a and 60.335 if approved by the administrator

TABLE A: LIMITS AND OTHER REQUIREMENTS

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Facility Name: Mankato Energy Center LLC

Permit Number: 01300098 - 001

Initial Performance Test: due 180 days after Startup but no later than 60 days after achieving the maximum production rate, to measure VOC emissions. Separate tests shall be conducted while combusting natural gas both with and without power augmentation, and while combusting distillate fuel oil.	Title I Condition: to measure VOC emissions subject to a 40 CFR Section 52.21(j) BACT limits; Minn. R. 7017.2020, subp. 1
Initial Performance Test: due 180 days after Initial Startup but no later than 60 days after achieving the maximum production rate, to measure PM and PM10. Separate tests shall be conducted while combusting natural gas either with or without power augmentation, and while combusting distillate fuel oil.	Title I Condition: to measure PM and PM10 emissions subject to a 40 CFR Section 52.21(j) BACT limits; meets PM test requirement in 40 CFR Section 60.48a if approved by the administrator; Minn. R. 7017.2020, subp. 1
Initial Performance Test: due 180 days after Startup but no later than 60 days after achieving maximum production rate, to measure formaldehyde and n-hexane and develop load-dependent emission factors for these pollutants in lb/mmBtu. Separate tests shall be conducted while combusting natural gas both with and without power augmentation, and while combusting distillate fuel oil.	Title I Condition: To limit HAP emissions to less than the major source level in 40 CFR Section 63.2; Minn. R. 7017.2020, subp. 1
<p>Formaldehyde and n-hexane Emission Factor/Rate Testing: Emission factors and rates shall be determined by using MPCA-approved stack test methods at the following combustion turbine loads and operating conditions:</p> <ol style="list-style-type: none"> 1. EU 001/EU 002 operating at 15 to 30 percent of full load for each fuel for formaldehyde only; 2. EU 001/EU 002 operating at 60 to 70 percent of full load for each fuel for formaldehyde only; 3. EU 001 & EU 003/EU 002 & EU 004 operating at 90 to 100 percent of full load for each fuel for formaldehyde and n-hexane. Power augmentation and duct burners shall be operated when turbines combust natural gas. Duct burners shall be operated when turbines combust distillate fuel oil. <p>SCR and oxidation catalyst systems shall be operated during testing when conditions are appropriate for the operation of these systems.</p>	Minn. R. 7007.0800, subp. 4

TABLE A: LIMITS AND OTHER REQUIREMENTS

09/29/04

Facility Name: Mankato Energy Center LLC

Permit Number: 01300098 - 001

Subject Item: EU 005 Auxiliary Boiler**Associated Items:** CE 009 DLN burners & FGR

SV 003 Auxiliary Boiler Stack

What to do	Why to do it
Total Particulate Matter: less than or equal to 0.008 lbs/million Btu heat input	Title I Condition: 40 CFR Section 52.21(j) BACT Limit
Particulate Matter < 10 micron: less than or equal to 0.008 lbs/million Btu heat input	Title I Condition: 40 CFR Section 52.21(j) BACT Limit
Nitrogen Oxides: less than or equal to 0.036 lbs/million Btu heat input	Title I Condition: 40 CFR Section 52.21(j) BACT Limit
Sulfur Dioxide: less than or equal to 0.001 lbs/million Btu heat input	Title I Condition: 40 CFR Section 52.21(j) BACT Limit
Carbon Monoxide: less than or equal to 0.06 lbs/million Btu heat input	Title I Condition: 40 CFR Section 52.21(j) BACT Limit
Volatile Organic Compounds: less than or equal to 0.007 lbs/million Btu heat input	Title I Condition: 40 CFR Section 52.21(j) BACT Limit
Permitted Fuel Type: Restricted to natural gas with a sulfur content no greater than 0.8 grains per 100 scf.	Title I Condition: 40 CFR Section 52.21(j) BACT limit for SO ₂ and H ₂ SO ₄ , and BACT fuel type restriction
Fuel Usage Recordkeeping: Record and maintain records of the amounts fuel combusted on a monthly basis. These records may be in the form of fuel bills or meter readings.	40 CFR Section 60.13(i) and February 20, 1992, EPA memorandum to meet the requirements of 40 CFR Section 60.48c(g)
Initial Performance Test: due 180 days after Startup but no later than 60 days after achieving the maximum production rate, to measure NO _x and CO emissions.	Title I Condition: to measure NO _x and CO emissions subject to a 40 CFR Section 52.21(j) BACT limit; Minn. R. 7017.2020, subp. 1

TABLE A: LIMITS AND OTHER REQUIREMENTS

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Facility Name: Mankato Energy Center LLC

Permit Number: 01300098 - 001

Subject Item: EU 006 Emergency Generator**Associated Items:** SV 004 Emergency Generator Stack

What to do	Why to do it
Permitted Fuel Type: Restricted to distillate fuel oil with a sulfur content no greater than 0.05 percent by weight.	Title I Condition: 40 CFR Section 52.21(j) BACT limit for SO ₂ and H ₂ SO ₄ , and BACT fuel type restriction
Opacity: less than or equal to 20 percent once operating temperatures have been attained.	Minn. R. 7011.2300, subp. 1
Total Particulate Matter: less than or equal to 0.07 grams per horsepower-hour	Title I Condition: 40 CFR Section 52.21(j) BACT Limit
Particulate Matter < 10 microns: less than or equal to 0.07 grams per horsepower-hour	Title I Condition: 40 CFR Section 52.21(j) BACT Limit
Sulfur Dioxide: less than or equal to 0.59 grams per horsepower-hour	Title I Condition: 40 CFR Section 52.21(j) BACT Limit
Nitrogen Oxides: less than or equal to 12.70 grams per horsepower-hour	Title I Condition: 40 CFR Section 52.21(j) BACT Limit
Carbon Monoxide: less than or equal to 1.00 grams per horsepower-hour	Title I Condition: 40 CFR Section 52.21(j) BACT Limit
Volatile Organic Compounds: less than or equal to 0.12 grams per horsepower-hour	Title I Condition: 40 CFR Section 52.21(j) BACT Limit
Monitoring - Distillate Fuel Oil Sulfur Content The permittee shall determine the sulfur content of all distillate fuel oil deliveries using one of the following options: 1. obtain a supplier certification for each fuel oil delivery stating the percent sulfur by weight in the delivered distillate fuel oil; 2. use the results of the part 75 Appendix D fuel oil sulfur determination requirements conducted for EU 001 and EU 002, if the distillate fuel oil used by EU 006 is from the same supplier and delivery as the distillate fuel oil used by EU 001/EU 002 (two separate fuel oil storage tanks are used; one for EU 006/EU 007 and another for EU 001/EU 002).	Title I Condition: Monitoring for 40 CFR Section 52.21(j) BACT fuel type restriction; Minn. R. 7007.0800, subp. 4 and 5
Operating Hours: less than or equal to 300 hours/year using 12-month Rolling Sum calculated monthly by the last day of each month.	Title I Condition: 40 CFR Section 52.21(k)
Operating Hours Recordkeeping: On each day of operation, the Permittee shall record the operating hours to the nearest tenth of an hour. By the last day of each month, the Permittee shall calculate and record the operating hours for the previous month based on the daily records, and for the previous 12-month period based on the monthly records.	Title I Condition: 40 CFR Section 52.21(k)

TABLE A: LIMITS AND OTHER REQUIREMENTS

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Facility Name: Mankato Energy Center LLC

Permit Number: 01300098 - 001

Subject Item: EU 007 Fire Pump Engine**Associated Items:** SV 005 Fire Pump Engine Stack

What to do	Why to do it
Permitted Fuel Type: Restricted to distillate fuel oil with a sulfur content no greater than 0.05 percent by weight.	Title I Condition: 40 CFR Section 52.21(j) BACT limit for SO ₂ and H ₂ SO ₄ , and BACT fuel type restriction
Opacity: less than or equal to 20 percent once operating temperatures have been attained.	Minn. R. 7011.2300, subp. 1
Total Particulate Matter: less than or equal to 0.07 grams per horsepower-hour	Title I Condition: 40 CFR Section 52.21(j) BACT Limit
Particulate Matter < 10 microns: less than or equal to 0.07 grams per horsepower-hour	Title I Condition: 40 CFR Section 52.21(j) BACT Limit
Sulfur Dioxide: less than or equal to 0.14 grams per horsepower-hour	Title I Condition: 40 CFR Section 52.21(j) BACT Limit
Nitrogen Oxides: less than or equal to 5.70 grams per horsepower-hour	Title I Condition: 40 CFR Section 52.21(j) BACT Limit
Carbon Monoxide: less than or equal to 0.25 grams per horsepower-hour	Title I Condition: 40 CFR Section 52.21(j) BACT Limit
Volatile Organic Compounds: less than or equal to 0.08 grams per horsepower-hour	Title I Condition: 40 CFR Section 52.21(j) BACT Limit
Monitoring - Distillate Fuel Oil Sulfur Content The permittee shall determine the sulfur content of all distillate fuel oil deliveries using one of the following options: 1. obtain a supplier certification for each fuel oil delivery stating the percent sulfur by weight in the delivered distillate fuel oil; 2. use the results of the part 75 Appendix D fuel oil sulfur determination requirements conducted for EU 001 and EU 002, if the distillate fuel oil used by EU 006 is from the same supplier and delivery as the distillate fuel oil used by EU 001/EU 002 (two separate fuel oil storage tanks are used; one for EU 006/EU 007 and another for EU 001/EU 002).	Title I Condition: Monitoring for 40 CFR Section 52.21(j) BACT fuel type restriction; Minn. R. 7007.0800, subp. 4 and 5
Operating Hours: less than or equal to 300 hours/year using 12-month Rolling Sum calculated monthly by the last day of each month.	Title I Condition: 40 CFR Section 52.21(k)
Operating Hours Recordkeeping: On each day of operation, the Permittee shall record the operating hours to the nearest tenth of an hour. By the last day of each month, the Permittee shall calculate and record the operating hours for the previous month based on the daily records, and for the previous 12-month period based on the monthly records.	Title I Condition: 40 CFR Section 52.21(k)

TABLE A: LIMITS AND OTHER REQUIREMENTS

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Facility Name: Mankato Energy Center LLC
Permit Number: 01300098 - 001

Subject Item: FS 001 Cooling Tower

What to do	Why to do it
The Permittee shall control PM and PM10 emissions by installing, operating, and maintaining a mist eliminator with a drift rate designed not to exceed 0.0005%.	Title I Condition: 40 CFR Section 52.21(j) BACT requirement

TABLE B: SUBMITTALS

09/29/04

Facility Name: Mankato Energy Center LLC
Permit Number: 01300098 - 001

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

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

Send any application for a permit or permit amendment to:

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

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

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

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

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

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

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

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

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

TABLE B: ONE TIME SUBMITTALS OR NOTIFICATIONS

09/29/04

Facility Name: Mankato Energy Center LLC

Permit Number: 01300098 - 001

What to send	When to send	Portion of Facility Affected
Application for Permit Reissuance	due 180 days before expiration of Existing Permit	Total Facility
Notification of the Actual Date of Initial Startup	due 15 days after Initial Startup	EU001, EU002, EU003, EU004, EU005
Notification of the Date Construction Began	due 30 days after Start Of Construction	EU001, EU002, EU003, EU004, EU005
Testing Frequency Plan	due 60 days after Initial Performance Test for NOx and CO emissions. The plan shall specify a testing frequency based on the test results for each pollutant and fuel type, and MPCA guidance. Future performance tests at 12-month, 36-month, 60-month, or another appropriate interval, shall be required upon written approval of the plan by the MPCA.	EU005
Testing Frequency Plan	due 60 days after Initial Performance Test for PM, PM10, VOC, formaldehyde, and n-hexane emissions. The plan shall specify a testing frequency based on the test results for each pollutant and fuel type, and MPCA guidance. Future performance tests at 12-month, 36-month, 60-month, or another appropriate interval, shall be required upon written approval of the plan by the MPCA. A separate plan shall be submitted for each CTG/DB system.	SV001
Testing Frequency Plan	due 60 days after Initial Performance Test for PM, PM10, VOC, formaldehyde, and n-hexane emissions. The plan shall specify a testing frequency based on the test results for each pollutant and fuel type, and MPCA guidance. Future performance tests at 12-month, 36-month, 60-month, or another appropriate interval, shall be required upon written approval of the plan by the MPCA. A separate plan shall be submitted for each CTG/DB system.	SV002

TABLE B: RECURRENT SUBMITTALS

09/29/04

Facility Name: Mankato Energy Center LLC

Permit Number: 01300098 - 001

What to send	When to send	Portion of Facility Affected
Excess Emissions/Downtime Reports (EER's)	due 30 days after end of each calendar quarter following Initial Startup of the Monitor (Submit Deviations Reporting Form DRF-1 as amended). The EER shall indicate all periods of NOx and/or CO CEMS bypass and all periods of exceedances of the NOx and/or CO limits including exceedances allowed by an applicable standard, i.e. during startup, shutdown, and malfunctions. The EER shall also include all information required by 40 CFR Section 60.334(j).	SV001
Excess Emissions/Downtime Reports (EER's)	due 30 days after end of each calendar quarter following Initial Startup of the Monitor (Submit Deviations Reporting Form DRF-1 as amended). The EER shall indicate all periods of NOx and/or CO CEMS bypass and all periods of exceedances of the NOx and/or CO limits including exceedances allowed by an applicable standard, i.e. during startup, shutdown, and malfunctions. The EER shall also include all information required by 40 CFR Section 60.334(j).	SV002
Semiannual Deviations Report	due 30 days after end of each calendar half-year following Permit Issuance. The first semiannual report submitted by the Permittee shall cover the calendar half-year in which the permit is issued. The first report of each calendar year covers January 1 - June 30. The second report of each calendar year covers July 1 - December 31. If no deviations have occurred, the Permittee shall submit the report stating no deviations.	Total Facility
Compliance Certification Report (Acid Rain Program)	due 60 days after end of each calendar year starting 01/01/2007	Total Facility
Compliance Certification	due 31 days after end of each calendar year following Permit Issuance (for the previous calendar year). Submit the certification on a form approved by the Commissioner, both to the Commissioner and to the US EPA regional office in Chicago. This certification covers all deviations experienced during the previous calendar year.	Total Facility

APPENDIX

Facility Name: Mankato Energy Center LLC

Permit Number: 01300098-001

Insignificant Activities Required To Be Listed

Activity	Citation	Applicable Performance Standard	Comment
900,000 gallon No. 2 distillate oil storage tank	Minn. R. 7007.1300, subp. 4.B.	Minn. R. 7011.1505 and 7011.1510 40 CFR part 60, subp. Kb	Only required to keep records of product stored and true vapor pressure
1,000 gallon No. 2 distillate oil storage tank	Minn. R. 7007.1300, subp. 4.B.	none	

Stack Parameters Relied Upon For Modeling (not including SV 001/SV 002 NO_x and CO startup and shutdown emission rates)

Stack	Height (meters)	Diameter (meters)	Temperature (°K)	gas velocity (m/sec)	CO			NO _x			SO ₂			PM ₁₀		
					g/s	lb/hr	tpy	g/s	lb/hr	tpy	g/s	lb/hr	tpy	g/s	lb/hr	tpy
SV 001	60.96	5.79	344.26	12.27	3.805	30.2	132.3	7.953	63.12	276.5	12.193	96.77	423.9	9.173	72.80	318.9
SV 002	60.96	5.79	344.26	12.27	3.805	30.2	132.3	7.953	63.12	276.5	12.193	96.77	423.9	9.173	72.80	318.9
SV 003	30.481	1.22	436.00	9.75	0.529	4.20	18.39	0.318	2.52	11.04	0.010	0.08	0.35	0.071	0.56	2.45
SV 004	4.572	0.41	733.10	29.81	0.514	4.08	17.87	*0.224	51.80	*7.77	0.304	2.41	10.56	0.037	0.29	1.27
SV 005	4.572	0.20	722.00	15.85	0.020	0.16	0.70	*0.016	3.65	*0.55	0.011	0.09	0.39	0.005	0.04	0.18
Cooling Tower (each of 12 cells)	13.714	8.79	298.71	8.63										0.007	0.06	0.25

*based on 300 hr/yr annual operating limit

Phase II Permit Application

For more information, see instructions and refer to 40 CFR 72.30 and 72.31

This submission is ☒ New ☐ Revised

Mankato Energy Center Plant Name	Minnesota State	56104 ORIS Code
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Compliance Plan

a Unit ID#	b Unit Will Hold Allowances in Accordance with 40 CFR 72.9(c)(1)	c Repowering Plan	d New Units Commence Operation Date	e New Units Monitor Certification Deadline
CT-1	Yes	-	6/2006	9/2006
CT-2	Yes		6/2006	9/2006

Standard Requirements

Permit Requirements.

- (1) The designated representative of each affected source and each affected unit at the source shall:
 - (i) Submit a complete Acid Rain permit application (including a compliance plan) under 40 CFR part 72 in accordance with the deadlines specified in 40 CFR 72.30; and
 - (ii) Submit in a timely manner any supplemental information that the permitting authority determines is necessary in order to review an Acid Rain permit application and issue or deny an Acid Rain permit;
- (2) The owners and operators of each affected source and each affected unit at the source shall:
 - (i) Operate the unit in compliance with a complete Acid Rain permit application or a superseding Acid Rain permit issued by the permitting authority; and
 - (ii) Have an Acid Rain Permit.

Monitoring Requirements.

- (1) The owners and operators and, to the extent applicable, designated representative of each affected source and each affected unit at the source shall comply with the monitoring requirements as provided in 40 CFR parts 74, 75, and 76.
- (2) The emissions measurements recorded and reported in accordance with 40 CFR part 75 shall be used to determine compliance by the unit with the Acid Rain emissions limitations and emissions reduction requirements for sulfur dioxide and nitrogen oxides under the Acid Rain Program.
- (3) The requirements of 40 CFR parts 74 and 75 shall not affect the responsibility of the owners and operators to monitor emissions of other pollutants or other emissions characteristics at the unit under other applicable requirements of the Act and other provisions of the operating permit for the source.

Sulfur Dioxide Requirements.

- (1) The owners and operators of each source and each affected unit at the source shall:
 - (i) Hold allowances, as of the allowance transfer deadline, in the unit's compliance subaccount (after deductions under 40 CFR 73.34(c)) not less than the total annual emissions of sulfur dioxide for the previous calendar year from the unit; and
 - (ii) Comply with the applicable Acid Rain emissions limitations for sulfur dioxide.
- (2) Each ton of sulfur dioxide emitted in excess of the Acid Rain emissions limitations for sulfur dioxide shall constitute a separate violation of the Act.
- (3) An affected unit shall be subject to the requirements under paragraph (1) of the sulfur dioxide requirements as follows:
 - (i) Starting January 1, 2000, an affected unit under 40 CFR 72.6(a)(2); or
 - (ii) Starting on the later of January 1, 2000 or the deadline for monitor certification under 40 CFR part 75, an affected unit under 40 CFR 72.6(a)(3).
- (4) Allowances shall be held in, deducted from, or transferred among Allowance Tracking System accounts in accordance with the Acid Rain Program.
- (5) An allowance shall not be deducted in order to comply with the requirements under paragraph (1)(i) of the sulfur dioxide requirements prior to the calendar year for which the allowance was allocated.
- (6) An allowance allocated by the Administrator under the Acid Rain Program is a limited authorization to emit sulfur dioxide in accordance with the Acid Rain Program. No provision of the Acid Rain Program, the Acid Rain permit application, the Acid Rain permit, or the written exemption under 40 CFR 72.7 and 72.8 and no provision of law shall be construed to limit the authority of the United States to terminate or limit such authorization.
- (7) An allowance allocated by the Administrator under the Acid Rain Program does not constitute a property right.

Nitrogen Oxides Requirements. The owners and operators of the source and each affected unit at the source shall comply with the applicable Acid Rain emissions limitation for nitrogen oxides.

Excess Emissions Requirements.

- (1) The designated representative of an affected unit that has excess emissions in any calendar year shall submit a proposed offset plan, as required under 40 CFR part 77.
- (2) The owners and operators of an affected unit that has excess emissions in any calendar year shall:
 - (i) Pay without demand the penalty required, and pay upon demand the interest on that penalty, as required by 40 CFR part 77; and
 - (ii) Comply with the terms of an approved offset plan, as required by 40 CFR part 77.

Recordkeeping and Reporting Requirements.

- (1) Unless otherwise provided, the owners and operators of the source and each affected unit at the source shall keep on site at the source each of the following documents for a period of 5 years from the date the document is created. This period may be extended for cause, at any time prior to the end of 5 years, in writing by the Administrator or permitting authority:

- (i) The certificate of representation for the designated representative for the source and each affected unit at the source and all documents that demonstrate the truth of the statements in the certificate of representation, in accordance with 40 CFR 72.24; provided that the certificate and documents shall be retained on site at the source beyond such 5-year period until such documents are superseded because of the submission of a new certificate of representation changing the designated representative;
 - (ii) All emissions monitoring information, in accordance with 40 CFR part 75;
 - (iii) Copies of all reports, compliance certifications, and other submissions and all records made or required under the Acid Rain Program; and,
 - (iv) Copies of all documents used to complete an Acid Rain permit application and any other submission under the Acid Rain Program or to demonstrate compliance with the requirements of the Acid Rain Program.
- (2) The designated representative of an affected source and each affected unit at the source shall submit the reports and compliance certifications required under the Acid Rain Program, including those under 40 CFR part 72 subpart I and 40 CFR part 75.

Liability.

- (1) Any person who knowingly violates any requirement or prohibition of the Acid Rain Program, a complete Acid Rain permit application, an Acid Rain permit, or a written exemption under 40 CFR 72.7 or 72.8, including any requirement for the payment of any penalty owed to the United States, shall be subject to enforcement pursuant to section 113(c) of the Act.
- (2) Any person who knowingly makes a false, material statement in any record, submission, or report under the Acid Rain Program shall be subject to criminal enforcement pursuant to section 113(c) of the Act and 18 U.S.C. 1001.
- (3) No permit revision shall excuse any violation of the requirements of the Acid Rain Program that occurs prior to the date that the revision takes effect.
- (4) Each affected source and each affected unit shall meet the requirements of the Acid Rain Program.
- (5) Any provision of the Acid Rain Program that applies to an affected source (including a provision applicable to the designated representative of an affected source) shall also apply to the owners and operators of such source and of the affected units at the source.
- (6) Any provision of the Acid Rain Program that applies to an affected unit (including a provision applicable to the designated representative of an affected unit) shall also apply to the owners and operators of such unit. Except as provided under 40 CFR 72.44 (Phase II repowering extension plans) and 40 CFR 76.11 (NO_x averaging plans), and except with regard to the requirements applicable to units with a common stack under 40 CFR part 75 (including 40 CFR 75.16, 75.17, and 75.18), the owners and operators and the designated representative of one affected unit shall not be liable for any violation by any other affected unit of which they are not owners or operators or the designated representative and that is located at a source of which they are not owners or operators or the designated representative.
- (7) Each violation of a provision of 40 CFR parts 72, 73, 74, 75, 76, 77, and 78 by an affected source or affected unit, or by an owner or operator or designated representative of such source or unit, shall be a separate violation of the Act.

Effect on Other Authorities. No provision of the Acid Rain Program, an Acid Rain permit application, an Acid Rain permit, or a written exemption under 40 CFR 72.7 or 72.8 shall be construed as:

- (1) Except as expressly provided in title IV of the Act, exempting or excluding the owners and operators and, to the extent applicable, the designated representative of an affected source or affected unit from compliance with any other provision of the Act, including the provisions of title I of the Act relating to applicable National Ambient Air Quality Standards or State Implementation Plans;
- (2) Limiting the number of allowances a unit can hold; provided, that the number of allowances held by the unit shall not affect the source's obligation to comply with any other provisions of the Act;
- (3) Requiring a change of any kind in any State law regulating electric utility rates and charges, affecting any State law regarding such State regulation, or limiting such State regulation, including any prudence review requirements under such State law;
- (4) Modifying the Federal Power Act or affecting the authority of the Federal Energy Regulatory Commission under the Federal Power Act; or,
- (5) Interfering with or impairing any program for competitive bidding for power supply in a State in which such program is established.

TECHNICAL SUPPORT DOCUMENT
For
DRAFT AIR EMISSION PERMIT NO. 01300098-001

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

1. General Information

1.1. Applicant and Stationary Source Location:

Applicant/Address	Stationary Source/Address (SIC Code: 4911)
Mankato Energy Center, L.L.C. (subsidiary of Calpine Corporation) 250 Parkway Drive, Suite 380 Lincolnshire, Illinois 60069	700 Summit Avenue Mankato Blue Earth County
Contact: Jason Goodwin, Regional Manager 4100 Underwood Road, Pasadena, TX 77507 (832) 476-4463; jgoodwin@calpine.com	

1.2. Description of the Permit Action

This permit action is a combined part 70 operating permit and a New Source Review construction permit for this proposed new facility. Mankato Energy Center, L.L.C. (Permittee) proposes to construct a 630 megawatt electric generating plant (facility). It will be composed of twin Siemens-Westinghouse combined cycle combustion turbine generators (CTG) fired primarily by natural gas. Each CTG will be equipped with a heat recovery steam generator (HRSG) and natural gas-fired duct burners to supply steam to a common steam turbine electric generator. Each CTG will have the capability of power augmentation through steam injection into the CTG just downstream of the combustor. This process increases mass flow through the CTG, which increases CTG power output. There is also an increase in the specific heat of the CTG exhaust which increases steam production by the HRSG, which in turn increases electricity production by the steam turbine electric generator.

The facility will also contain an auxiliary boiler, emergency generator and fire pump engines, a fuel oil storage tank for the CTGs, a fuel oil storage tank for the emergency engines, and a cooling tower.

1.3. Facility Emissions:

Table 1. Total Facility Potential to Emit Summary:

	PM tpy	PM ₁₀ tpy	SO ₂ tpy	NO _x tpy	CO tpy	VOC tpy	H ₂ SO ₄ tpy	Single HAP tpy	Total HAPs tpy
Total Facility Limited Potential Emissions	207	198	134	368	3999	599	20.2	9.54	23.08

Table 2. Facility Classification

Classification	Major/Affected Source	Synthetic Minor	Minor
PSD	PM, PM ₁₀ , SO ₂ , NO _x , CO, VOC, H ₂ SO ₄		Lead
Part 70 Permit Program	PM ₁₀ , SO ₂ , NO _x , CO, VOC		
Part 63		Single HAP, Total HAPs	

2. Regulatory and/or Statutory Basis

New Source Review

The proposed facility is a major source under the New Source Review permit program. The Permittee has conducted a BACT analysis, PSD air analysis, and additional impacts analysis. The facility will use add-on control equipment to restrict NO_x, CO, and VOC emissions. Each CTG/duct burner system is a clean unit for NO_x, CO, and VOC due to the use of the add-on control equipment as BACT.

Part 70 Permit Program

The proposed facility is a major source under the Part 70 permit program for all pollutants except HAPs. Limits on formaldehyde and n-hexane for each CTG/duct burner system restrict single and total HAP emissions to less than the major source level.

New Source Performance Standards (NSPS)

Several new source performance standards will apply to emission units at the facility. The CTGs will be subject to subp. GG, the duct burners will be subject to subp. Da, the auxiliary boiler will be subject to subp. Dc, and the CTG fuel oil storage tank will be subject to subp. Kb. Generic requirements for performance testing and monitoring are included in GP 001 for the gas turbines and in GP 002 for the duct burners. Detailed requirements were not included because operators of combined cycle gas turbines commonly request U.S. Environmental Protection Agency approval for alternate monitoring and testing requirements based on the Acid Rain program and BACT permit requirements, and it is possible that the Permittee will do likewise.

National Emission Standards for Hazardous Air Pollutants (NESHAP)

The facility would qualify as an affected facility under the gas turbine NESHAP, 40 CFR part 63, subp. YYYY, if permitted emissions exceeded the major source thresholds in §63.2. However, the facility has accepted HAP limits to restrict total facility single and total HAP emissions to less than the major source levels. Therefore, subp. YYYY will not apply. In addition, because the entire facility is not a major HAP source, the industrial boiler and RICE MACT standards (subps. DDDDD and ZZZZ, respectively) do not apply either.

For reference, under subp. DDDDD, the boiler is classified as a new large gaseous fueled boiler and therefore the only applicable emission limit would be 400 ppm CO @ 3% O₂. No particulate matter, metal HAPs, HCl, or mercury limits would apply. Initial and annual CO stack testing would also be required. No CO CEMS is required because boiler heat input does not exceed 100 mmBtu/hr.

These CTGs are gas-fired lean pre-mix turbines, that are permitted to burn fuel oil for a total of 1750 hr/yr total for the two gas turbines. On April 7, 2004, (Volume 69, Number 67 Page 18327-18338), EPA proposed to de-list 4 turbine subcategories, including the gas-fired lean pre-mix subcategory where all turbines at a site combust fuel oil for no more than 1000 hours per year. Due to the permitted 1750 hours/year of fuel oil combustion for the two gas turbines, the Permittee's gas turbines are not included in the gas-fired lean pre-mix subcategory and will not be de-listed. However, as previously stated, the facility has accepted HAP limits for the gas turbines and will not be a major source under §63.2.

Acid Rain Program

Each combined cycle CTG and duct burner system is a new utility unit subject to the Acid Rain Program requirements. The units must hold SO₂ allowances, and monitor and report emissions of SO₂, NO_x, and CO₂. Both units qualify as gas-fired and diesel-fired utility units, and therefore opacity monitoring is not required as allowed by §§75.14(c) and (d).

Minnesota State Rules

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

- Minn. R. 7011.2300 Standards of Performance for Stationary Internal Combustion Engines
- Minn. R. 7011.1505 Standards of Performance for Storage Vessels
- Minn. R. ch. 4410 Environmental Review

Table 3. Regulatory Overview of Facility

EU, GP, or SV	Applicable Regulations	Comments:
GP 001 gas turbines	40 CFR part 60, subp. GG	Standards of Performance for Stationary Gas Turbines
GP 002 duct burners	40 CFR part 60, subp. Da	Standards of Performance for Electric Utility Steam Generating Units Construction After September 18, 1978
GP 003 gas turbine/duct burner stack	Title I Condition: 40 CFR § 52.21(j) and (x)	BACT and Clean Unit Requirements

GP 003 gas turbine/duct burner stack (cont.)	Title I Condition: 40 CFR § 63.2	HAP limits to avoid major source level and MACT standards
	Acid Rain Program	Continuous Emissions Monitoring System Requirements
	Minn. R. ch 7017	Performance Testing Requirements
EU 005 auxiliary boiler	Title I Condition: 40 CFR § 52.21(j) 40 CFR part 60, subp. Dc	Prevention of Significant Deterioration. BACT limits. Subpart Dc -- Standards of Performance for Small Industrial-Commercial-Institutional Steam Generating Units
EU 006 emergency generator	Title I Condition: 40 CFR § 52.21(j) Minn. R. 7011.2300	Prevention of Significant Deterioration. BACT limits. Fuel sulfur content monitoring. Standards of Performance for Stationary Internal Combustion Engines
EU 007 fire pump	Title I Condition: 40 CFR § 52.21(j) Minn. R. 7011.2300	Prevention of Significant Deterioration. BACT limits. Fuel sulfur content monitoring. Standards of Performance for Stationary Internal Combustion Engines

3. Technical Information

BACT Analysis: The Permittee submitted a top-down BACT analysis. The Permittee proposed to use the top technically feasible add-on control equipment. This is selective catalytic reduction (SCR) with ammonia injection for NO_x control, and catalytic oxidation for CO and VOC control. In addition, both combustion turbines will be equipped with dry low-NO_x (DLN) combustors for natural gas firing, and will use water/steam injection when combusting fuel oil, for additional NO_x control. DLN combustors can be fired in lean pre-mix mode when combusting natural gas, however, the lean pre-mix mode is not attained until the minimum optimal operating load of 60% is reached.

Due to the selection of the top control option, cost analyses were not submitted for NO_x, CO, and VOC control equipment (as allowed by the draft Oct. 1990 EPA New Source Review Manual, page B.8). BACT for PM/PM₁₀, SO₂, and H₂SO₄ is in the form of fuel type restrictions (natural gas and distillate fuel oil), and fuel sulfur content restrictions.

EU 005 (auxiliary boiler) will employ flue gas recirculation and dry low NO_x burners for NO_x control along with good combustion practices and low ash/low sulfur fuel for control of PM/PM₁₀, SO₂, CO, VOC, and H₂SO₄. EU 006 (emergency generator) and EU 007 (fire pump) BACT requirements are good

combustion, and low sulfur/low ash fuels. FS 001 (cooling tower) PM and PM₁₀ emissions will be controlled by a mist eliminator and proper maintenance according to manufacturer's recommendations.

PSD Air Modeling: PSD modeling was conducted for the proposed facility. See results in the table 4 below. Preliminary modeled impacts from the facility exceeded the PSD increments for PM₁₀, SO₂, and NO_x. As a result, additional modeling for these pollutants was performed that demonstrated compliance for the NAAQS, MAAQS, and PSD increments for these pollutants.

Table 4. PSD Modeling Results

Concentrations in $\mu\text{g}/\text{m}^3$									
Description	SO ₂				NO _x	PM ₁₀		CO ¹	
	1-Hour	3-Hour	24-Hour	Annual	Annual	24-Hour	Annual	1-Hour	8-Hour
MEC, Other Increment Consuming Sources	--	75.9	33.5	4.8	3.8	22.2	1.8	--	--
PSD Increment	None	512	91	20	25	30	17	None	None
MEC, Nearby Sources; Normal Operation	1056.3	482.0	107.6	9.4	19.3	86.1	21.1	149.5	80.7
Background Concentration	144.8	102.4	48.0	4.0	13.6	29.6	18.4	--	--
Combined Impact, Normal Operation	1201.1	584.4	155.6	13.4	32.9	115.7	39.5	149.5	80.7
MEC, Start-Up / Shut-Down Operation	--	--	--	--	7.4	--	--	8,500	1,990
Background Concentration	--	--	--	--	13.6	--	--	1,183	935
Combined Impact, SUSD Operation	--	--	--	--	21	--	--	9,683	2,925
NAAQS	None	1300	365	80	100	150	50	40,000	10,000
MAAQS	1300	1300	365	60	100	150	50	35,000	10,000

¹Predicted CO impacts during normal operation were less than PSD significant impact levels. Impacts for MEC only.

The NO_x emission rates based on 300 hr/yr operation were used for the emergency generator (EU 006) and the fire pump (EU 007) PSD air analysis modeling. As a result, the operating hours limit and recordkeeping requirement are title I Conditions based on the PSD air analysis.

PSD Additional Impacts Analysis: The growth analysis, soils and vegetation analysis, and visibility impairment analysis are attached. Significant impacts due to the construction and operation of the plant are not expected.

Clean Unit Determination: Each CTG/duct burner system is a clean unit for NO_x as defined in 40 CFR § 52.21(x) due to the use of selective catalytic reduction (SCR) and dry low-NO_x combustion (DLN) when combusting natural gas and SCR and water injection when combusting distillate fuel oil. Each CTG/duct burner system is a clean unit for CO and VOC as defined in 40 CFR § 52.21(x) due to the use of an

oxidation catalyst. Each CTG/duct burner system is not a clean unit for PM/PM₁₀ or SO₂ because no investment/capital expense was necessary to meet the applicable BACT limits for these pollutants. (See page 80225 Federal Register vol. 67 No. 251, December 31, 2002. preamble section V.C.4.).

Startup and Shutdown: This permit does not contain limits on startup and shutdown operating hours because the permittee modeled emissions in a continuous startup/shutdown operating mode and the results did not exceed AAQS. However, a BACT requirement to limit startup and shutdown to the shortest time period possible is included in the permit. A definition for the boundary between SUSD and normal operation (60% load is the cutoff for SUSD and normal operation) is contained in this permit to delineate when certain BACT emission limits do not apply. The CEMS data acquisition and handling system (DAHS) monitors percent operating load using a signal from the combustion turbine control system. The DAHS automatically categorizes emissions data as SUSD emissions, or normal emissions, based on the operating load signal from the combustion turbine control system.

AERA: The MPCA Risk Managers met on July 12, 2004, to discuss the AERA. After consideration of all of this information, the Risk Managers conclude that the facility air risk analysis is complete and that the impacts associated with air emissions that are reasonably expected to occur from this project do not have the potential for significant environmental or health impacts.

In reaching this conclusion the Risk Managers note the following: 1) land-use in the vicinity of the plant suggest that the farmer exposure pathway is unlikely to occur; and 2) emission factors for dioxin and mercury are deemed to be very uncertain and likely over estimate the potential emissions for those substances.

Performance Testing: Testing is required for each CTG/DB for each fuel type and certain operating conditions, for PM/PM₁₀, SO₂, NO_x, and VOC. CO testing is not required because CO is measured by a CEMS (although NO_x is measured by a CEMS too, NO_x performance testing is required by part 60 subp GG).

SO₂ and NO_x testing while combusting natural gas is required only when using power augmentation, because this is worst case for these pollutants due to maximum fuel consumption rate by the CTG during power augmentation. Testing to determine compliance with the NO_x BACT limit while combusting natural gas without power augmentation is not required because NO_x is measured by a CEMS. Testing is also required while combusting distillate fuel oil for these pollutants (power augmentation can not be used with fuel oil combustion because during fuel oil combustion water injection is used for NO_x control).

VOC testing is required while combusting natural gas with and without power augmentation because BACT limits are dependent on fuel type and operation of power augmentation when combusting natural gas. Testing is also required while combusting distillate fuel oil.

PM and PM₁₀ testing while combusting natural gas with or without power augmentation is required because the BACT limits for these pollutants are independent of power augmentation operation. Testing is also required while combusting distillate fuel oil.

H₂SO₄ testing is not required. This is because both permitted fuels are very low in sulfur content, and no applicable requirement requires H₂SO₄ testing. The Permittee provided calculations that H₂SO₄ emissions are 15.2% of SO₂ emissions, in part due to oxidation of some of the SO₂ back to SO₃ by the

SCR and oxidation catalyst. However, testing is not warranted to verify this, because the H₂SO₄ BACT limit is a limit on the fuel sulfur content.

Testing to develop load-dependent emissions factors for formaldehyde is required. Testing is also required for n-hexane but only at base load because n-hexane is emitted only by the duct burners and these operate only at base load (90% to 100% load).

Formaldehyde and n-hexane are the majority of total HAP emissions. According to emissions data from the manufacturer, CO emissions at 90-100% load when the CTG combusts natural gas with duct burners and power augmentation are worst case compared to CTG operation at 90-100% load without duct burners or power augmentation. Also according to emissions data from the manufacturer, CO emissions at 90-100% load when the CTG combusts distillate fuel oil with duct burners are worst case compared to CTG operation at 90-100% load without duct burners. Assuming that CO is a surrogate for organic HAPs such as formaldehyde and n-hexane, the required testing should be worst case these HAPs for the 90-100% operating load. This testing is necessary to provide accurate formaldehyde and n-hexane emissions data to demonstrate that the turbines are not major HAP sources.

Auxiliary boiler testing is limited to NO_x and CO to verify emission data used to cost-out add-on control equipment for BACT. No emissions testing of EU 006 and EU 007 is warranted due to the small size and very limited monthly testing and emergency-only use of these emission units.

Part 64 Compliance Assurance Monitoring (CAM): 40 CFR §64.2(a) states that a pollutant-specific emissions unit (for this facility this would be the two CTG/duct burner systems EU 001/EU 003 and EU 002/EU 004) at a major part 70 source is subject to part 64 if the unit:

1. is subject to an emissions limitation or standard for the applicable regulated air pollutant (the CTG/duct burner systems are subject to NO_x, CO, and VOC BACT limits);
2. uses a control device (selective catalytic reduction, DLN, and/or water injection is used for NO_x control, and an oxidation catalyst is used for CO and VOC control) to achieve compliance, and;
3. has pre-control device emissions of the applicable regulated pollutant that are equal to or greater than 100% of the amount required for the source to be classified as major source (for each CTG/duct burner system, pre-control device NO_x is 1106 tpy, pre-control device CO is 1194 (excluding startup/shutdown), and pre-control VOC is 189 tpy (excluding startup and shutdown) which is greater than 100% of the 100 tpy major source level for part 70).

Therefore the CTG/duct burner NO_x, CO, and VOC emissions may be subject to CAM.

However, it appears each CTG/duct burner system is not subject to CAM for NO_x and CO as indicated by §64.2(b)(1)(vi) due to use of a NO_x and CO CEMS for continuous compliance determination. 40 CFR § 64.2(b)(1)(vi) says the requirements of part 64 do not apply to an emission limitation or standard if a part 70 permit requires a *continuous compliance determination method*, as defined in §64.1, for the limit or standard.

§64.1 *continuous compliance determination method*: a method, specified by the applicable standard or an applicable permit condition, which is used to determine compliance on a continuous basis consistent with the averaging period established for the emission limitation or standard, and, provides data either in units of the standard or correlated directly with the compliance limit.

There are three short-term NO_x BACT limits and four short-term CO BACT limits. All limits are in units of ppmvd @15% O₂ on a 3-hour average basis. The permit requires automatic calculation and recording of the 3-hour average NO_x and CO emission concentration in ppmvd @15% O₂.

Although it appears that CTG/duct burner system NO_x and CO emissions are not subject to CAM, §64.3(d) does state that there are special criteria for use of CEMS when CAM would apply. §64.3(d)(1) says that if a CEMS is required, the owner or operator shall use the CEMS to satisfy the requirements of part 64. §64.3(d)(2)(iv) further states that a CEMS used to meet the requirements of part 75 (which the CTG/duct burner NO_x CEMS do), is deemed to satisfy the general design criteria in §64.3(a) and (b). Finally, §64.3(d)(3) states that the CEMS shall be designed to allow for reporting of exceedances consistent with any period for reporting of exceedances in the underlying requirement. As previously indicated, the permit requires automatic calculation and recording of the 3-hour average NO_x and CO emission concentrations in ppmvd @15% O₂.

However, unlike the CTG/duct burner NO_x and CO emissions, it is clear that VOC emissions are subject to CAM. The Permittee has proposed to use the CO CEMS as a surrogate for monitoring VOC. The permit requires verification of the surrogate correlation by comparing measured VOC emission rates from VOC performance testing, with the CEMS-measured CO emissions rates during the corresponding times of VOC performance testing.

Part 60 Subpart Da Monitoring and Compliance Provisions: The duct burners (EU 002/EU 004) are subject to subpart Da. The requirements in subpart Da are somewhat confusing in their application to a duct burner, so they are discussed below:

The Permittee has elected to comply with the output-based NO_x standard in §60.44a(d)(1) of 1.6 lb NO_x/gross MWhr.

§60.46a(k) provides two compliance provisions for determining NO_x emissions. §60.46a(k)(1) specifies performance testing of the HRSG stack (SV 001/SV 002) and the CTG (EU 001/EU 002) to determine the DB (EU 003/EU 004) NO_x emissions. §60.46a(k)(2) specifies the use of a NO_x CEMS and either an exhaust gas flowmeter or fuel flow meter, along with a wattmeter to determine the NO_x emissions for the combined CTG/DB emissions on a 30-day rolling average basis. Finally, §60.46a(k)(3) applies to facilities where more than one DB HRSG supplies steam to a common steam turbine generator.

§60.47a(o) states that the Permittee is not required to install and operate a NO_x CEMS, exhaust gas flowmeter, and wattmeter, for measuring NO_x emissions from just the duct burner. However, if the 60.46a(k)(2) option for NO_x compliance is selected, certain NO_x CEMS and flowmeter requirements in §60.47a are applicable.

§60.48(d) states that DB compliance with the NO_x limit is determined using appendix A method 19 and the NO_x concentration measured by the NO_x CEMS. However, if a NO_x CEMS is not installed for (just the) the duct burner, and no NO_x CEMS is installed on the HRSG stack (which can occur though unlikely if the combined cycle turbine is a peaking unit and uses part 75 appendix E for NO_x determination in place of a CEMS), then it is assumed that the performance testing under §60.46a(k)(1) is the required method for compliance demonstration with the NO_x limit.

§60.49a reporting requirements apply to initial performance test results, CEMS performance evaluations, and CEMS emission data. For this facility, if NO_x is determined with a CEMS according to

§60.46a(k)(2), NO_x CEMS data would be reported. Reporting is done on a 30 boiler operating day rolling average basis. A boiler operating day is defined as a 24-hour period when fuel is combusted for the entire 24 hours. The intended operation of the facility is as an intermediate load plant, and intermediate load plants typically operate for only 16 hours per day. So it is unlikely that the reporting requirement would be triggered because it is unlikely that fuel would be fired for 24 consecutive hours.

3.1 Calculations of Potential to Emit

See attached spreadsheet.

Emission factors for PM/PM₁₀, NO_x, VOC, and CO are based on manufacturer's emissions guarantees. SO₂ emissions are based on the natural gas fuel sulfur BACT limit of 0.8 gr/100 scf NG limit and the distillate fuel oil sulfur limit of 0.05% by weight, and do not account for conversion of some of the fuel sulfur to H₂SO₄.

The NG SO₂ emission limit of 0.8 gr total sulfur/100 scf is equivalent to an SO₂ emission rate of 0.0022409 lb/mmBtu at 1020 Btu/scf.

$$0.8 \text{ gr/100 scf} * 100 \text{ scf/102,000 Btu} * 10^6 \text{ Btu/mmBtu} * 2 \text{ lb SO}_2/\text{lb S} * \text{lb/7000 gr} = 0.0022409 \text{ lb SO}_2/\text{mmBtu}$$

Note that the Permittee reported a manufacturer's SO₂ emission rate of 0.0012 lb/mmBtu for NG but this doesn't coincide with the 0.8 gr S/100 scf, so the 0.0022409 lb/mmBtu value was used in place of 0.0012 lb/mmBtu. No credit towards SO₂ emissions is given for fuel sulfur emitted as H₂SO₄.

Startup and shutdown emissions: NO_x, CO, and VOC emissions are highest during startup and shutdown, according to the gas turbine manufacturer. Annual potential emissions were calculated assuming 260 startup/shutdown events, of which 10% (26) are on fuel oil (because fuel oil is limited to an annual capacity factor of 10%) with the remainder on natural gas.

The CTG/DB worst case lb/hr emissions (excluding startup and shutdown) are from maximum heat input which occurs at or near 0°F except for pollutants that are worst case when firing NG with power augmentation. Worst case annual emissions are based on maximum lb/hr emission rate at the average ambient temp at or near 44F.

The Permittee provided calculations showing that H₂SO₄ emissions are 15.2% of SO₂ emissions, due to fuel sulfur conversion to SO₃, and then to H₂SO₄, and SCR and oxidation catalyst conversion of SO₂ to SO₃ which converts to H₂SO₄. However, as previously indicated, no credit towards SO₂ emissions is given for fuel sulfur emitted as H₂SO₄.

3.2 Periodic Monitoring

In accordance with the Clean Air Act, it is the responsibility of the owner or operator of a facility to have sufficient knowledge of the facility to certify that the facility is in compliance with all applicable requirements.

In evaluating the monitoring included in the permit, the MPCA considers the following:

- The likelihood of violating the applicable requirements;
- Whether add-on controls are necessary to meet the emission limits;
- The variability of emissions over time;

- The type of monitoring, process, maintenance, or control equipment data already available for the emission unit;
- The technical and economic feasibility of possible periodic monitoring methods; and
- The kind of monitoring found on similar units elsewhere:

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

Table 5. Periodic Monitoring

[illegible]

EU 005	40 CFR §52.21(j)	CO and NOx stack testing	NOx and CO limits are emission rates used in BACT analysis which showed add-on control was cost prohibitive; testing for NOx and CO is warranted to verify these BACT emission rates.
		Fuel type restriction	Fuel restricted to natural gas therefore no additional periodic monitoring is warranted.
EU 006	40 CFR §52.21(j)	fuel sulfur content monitoring	No additional monitoring or testing warranted due to small size and emergency nature of operation
EU 007	40 CFR §52.21(j)	fuel sulfur content monitoring	No additional monitoring or testing warranted due to small size and emergency nature of operation.

3.3 Insignificant Activities

There are two fuel oil storage tanks that are insignificant activities (900,000 gallon and a 1,000 gallon). The large tank is mostly exempt from part 60 subp. Kb, except for the permanent recordkeeping of the tank dimensions and volume analysis. Minn. R. 7011.1505, subp. 3 does not apply due to low vapor pressure of distillate fuel oil, however, recordkeeping requirements in Minn. R. 7011.1510, subp. 1 do apply.

3.4 Permit Organization

Three groups were created for pairs of identical equipment (CTG and duct burners) to reduce the length and repetitiveness of the permit.

The CTG requirements (primarily from 40 CFR Part 60, subp. GG) are in GP 001, and apply individually to each CTG. The duct burner requirements (primarily from part 60 subp. Da) are in GP 002, and also apply individually to each duct burner. The requirements for the common stack for each CTG/duct burner system are in GP 003, and apply individually to each stack. GP 003 contains requirements primarily based on New Source Review permitting and the acid rain program.

3.5 30-day Public Notice and 45-day EPA Review

Public comment period started August 11, 2004, and ended September 9, 2004.
EPA review started August 11, 2004, and ended September 24, 2004.

A voice mail message from Bill Wagner (507) 625-4562 dated Aug 16, 2004 inquiring about type of fuel to be burned in MEC was received. On August 23, 2004, Marshall Cole returned the call by leaving a message on Mr. Wagner's answering machine at this number, stating natural gas is primary fuel and light

fuel oil up to 10% of the year is also permitted. For additional information, call Marshall Cole back, and/or look at draft permit and TSD on MPCA website. Mr. Wagner did not call back.

Near the end of the public notice, the permit was revised by adding a requirement to GP 003 from the acid rain permit program for monitoring or calculating emissions of SO₂, NO_x, and CO₂ in accordance with 40 CFR Section 75.

EPA did not comment. After the end of the public comment, the permit was revised by adding the two-part requirement in the total facility section of the permit regarding prohibition of operation pending issuance of NPDES/SDS Permit MN0030171.

4. Conclusion

Based on the information provided by Mankato Energy Center, LLC/Calpine Corporation, the MPCA has reasonable assurance that the proposed operation of the emission facility, as described in the Air Emission Permit No. 01300098-001 and this technical support document, will not cause or contribute to a violation of applicable federal regulations and Minnesota Rules.

Staff Members on Permit Team: Marshall Cole (permit writer/engineer)
 Scott Parr (enforcement)
 Dan Brady (stack testing)
 Jenny Reinertsen (peer reviewer)

Attachments: 1. PTE Summary and Calculation Spreadsheets
 2. BACT Analysis
 3. Ambient Air Quality Analysis
 4. Additional Impacts Analysis