

**AIR EMISSION PERMIT NO. 01700011- 005**  
**Total Facility Operating Permit - Reissuance**

**IS ISSUED TO**

Northern Natural Gas Company

**NORTHERN NATURAL GAS COMPANY - WRENSHALL LNG**  
2301 County Road 1  
Wrenshall, Carlton County, MN 55797

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

This permit reissuance supersedes Air Emission Permit No. 01700011-004, and authorizes the Permittee to operate the stationary source at the address listed above unless otherwise noted in Table A. The Permittee must comply with all the conditions of the permit. Any changes or modifications to the stationary source must be performed in compliance with Minn. R. 7007.1150 to 7007.1500. Terms used in the permit are as defined in the state air pollution control rules unless the term is explicitly defined in the permit.

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

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

**Operating Permit Issue Date:** **October 26, 2011**

**Expiration Date:** **October 26, 2016**

\* – All Title I Conditions do not expire.

\* The Permittee may continue to operate this facility after the expiration date of the permit, per the provision under Minn. R. 7007.0450, subp. 3.

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

for Paul Aasen  
Commissioner  
Minnesota Pollution Control Agency

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Total Facility Operating Permit -Reissuance	April 5, 2010 June 27, 2011	005

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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 facility is a liquid natural gas plant on County Road 1 near Wrenshall, Minnesota. The Wrenshall LNG station is used to liquefy and store natural gas for later vaporization and distribution into the underground natural gas pipelines as needed. The facility consists of a compressor/turbine building which houses two natural gas-fired turbines (both are Allison 501-KB turbines rated at 4,475 horsepower), three natural gas-fired vaporizers (Ryan 75-100 vaporizer units rated at 72.7 MMBtu/hr each), a 26,460,000 gallon LNG storage tank, a 11,700 gallon Ethylene storage tank, a 5,900 gallon Pentane storage tank, a 2,000 gallon Butane storage tank, a 4,050 gallon Propane storage tank, a small natural gas flare which is used to combust excess gasses from the tank, and a diesel-fired fire pump (a Cummins N-855-5 engine rated at 192 horsepower). The primary emissions are nitrogen oxides (NO<sub>x</sub>), carbon monoxide (CO), and greenhouse gasses (CO<sub>2</sub>e) from the turbines, vaporizers, and reciprocating engine. Emissions are not controlled. The facility also has equipment that qualifies as insignificant activities under Minn. R. 7007.1300, subparagraphs 3 and 4.

This is a reissuance of the Title V operating permit. In this permit action, EU 005 has been replaced with the same model gas generator and power turbine built in August 1966, and EU 006 has been replaced with the same model gas generator and power turbine built in November 1973. Federal NESHAP requirements for the emergency fire pump engine have been added. In addition, a limit on greenhouse gas emissions (as carbon equivalent CO<sub>2</sub>e) was added to the permit.

**TABLE A: LIMITS AND OTHER REQUIREMENTS**

A-1

10/26/11

Facility Name: Northern Natural Gas Co - Wrenshall LNG

Permit Number: 01700011 - 005

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

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

<b>What to do</b>	<b>Why to do it</b>
OPERATIONAL REQUIREMENTS	hdr
Permit Appendices: This permit contains appendices as listed in the permit Table of Contents. The Permittee shall comply with all requirements contained in Appendix B, Insignificant Activities, and Applicable Requirements. Modeling parameters in Appendix C, Turbine Stack Parameters Relied Upon to Demonstrate Compliance with National Ambient Air Quality Standards (NAAQS) are included for reference only and compliance with these parameters is achieved through the requirements located in Permit No. 01700011-005.	Minn. R. 7007.0800, subp. 2
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 control practices and shall include a preventative maintenance program for the equipment and practices, a description of (the minimum but not necessarily the only) corrective actions to be taken to restore the equipment and practices to proper operation to meet applicable permit conditions, a description of the employee training program for proper operation and maintenance of the control equipment and practices, and the records kept to demonstrate plan implementation.	Minn. R. 7007.0800, subp. 14 and Minn. R. 7007.0800, subp. 16(J)
Operation Changes: In any shutdown, breakdown, or deviation the Permittee shall immediately take all practical steps to modify operations to reduce the emission of any regulated air pollutant. The Commissioner may require feasible and practical modifications in the operation to reduce emissions of air pollutants. No emissions units that have an unreasonable shutdown or breakdown frequency of process or control equipment shall be permitted to operate.	Minn. R. 7019.1000, subp. 4
Ambient Air Quality Standards: The Permittee shall comply, and upon written request demonstrate compliance, with National Primary and Secondary Ambient Air Quality Standards, 40 CFR pt. 50, and the Minnesota Ambient Air Quality Standards, Minn. R. 7009.0010 to 7009.0080.	40 CFR pt. 50; Minn. Stat. Sec. 116.07, subds. 4a and 9; Minn. R. 7007.0100, subps. 7A, 7L, and 7M; Minn. R. 7007.0800, subps. 1, 2, and 4; Minn. R. 7009.0010-7009.0080
The parameters used in NOx modeling for permit number 01700011-005 are listed in Appendix C of this permit.	Minn. Stat. Sec. 116.07, subds. 4a and 9; Minn. R. 7007.0100, subps. 7A, 7L, and 7M; Minn. R. 7007.0800, subps. 1, 2, and 4; Minn. R. 7009.0010-7009.0080
Modeling Triggers: For changes that do not require a permit amendment and affect any modeled parameter documented in Appendix C, or are an addition to the information documented in Appendix C, a Remodeling Submittal requirement is not triggered at the time of the change. The Permittee shall keep updated records on site of all parameters and emission rates. The Permittee shall submit any changes to parameters and emission rates with the next required Remodeling Submittal.	Minn. Stat. Sec. 116.07, subds. 4a and 9; Minn. R. 7007.0100, subps. 7A, 7L, and 7M; Minn. R. 7007.0800, subps. 1, 2, and 4; Minn. R. 7009.0010-7009.0080
For changes that require a minor, moderate, or major permit amendment and affect any modeled parameter documented in Appendix C, or are an addition to the information documented in Appendix C, a Remodeling Submittal requirement is triggered. The Permittee shall include previously made changes to parameters and emission rates that did not trigger a Remodeling Submittal.	
Remodeling Submittal: The Permittee must submit to the Commissioner for approval changes meeting the above criteria and must wait for a written approval before making such changes. For minor amendments, written approval of the modeling may be given before permit issuance; however, this approval applies only to the modeling and not to any other changes. The information submitted must include, for stack and vent sources, source emission rate, location, height, diameters, exit velocity, exit temperature, discharge direction, use of rain caps or rain hats, and, if applicable, locations and dimensions of nearby buildings. For non-stack/vent sources, this includes the source emission rate, location, size and shape, release height, and, if applicable, any emission rate scalars, and the initial lateral dimensions and initial vertical dimensions and adjacent building heights.	Minn. Stat. Sec. 116.07, subds. 4a and 9; Minn. R. 7007.0100, subps. 7A, 7L, and 7M; Minn. R. 7007.0800, subps. 1, 2, and 4; Minn. R. 7009.0010-7009.0080

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

10/26/11

Facility Name: Northern Natural Gas Co - Wrenshall LNG

Permit Number: 01700011 - 005

Remodeling Submittal, continued: The plume dispersion characteristics due to the revisions of the information must be equivalent to or better than the dispersion characteristics modeled dated 3/14/2003. The Permittee shall demonstrate this equivalency in the proposal. If the information does not demonstrate equivalent or better dispersion characteristics, or if a conclusion cannot readily be made about the dispersion, the Permittee must submit full remodeling.	Minn. Stat. Sec. 116.07, subds. 4a and 9; Minn. R. 7007.0100, subps. 7A, 7L, and 7M; Minn. R. 7007.0800, subps. 1, 2, and 4; Minn. R. 7009.0010-7009.0080
Modeling at Reissuance: The Permittee shall submit an assessment with the reissuance application (due as stated elsewhere in this permit) that addresses any changes made during the permit term that did not require a permit amendment but that affected any modeled parameter or emission rate (including adding sources beyond those documented in Appendix C) and were not assessed in a later modeling submittal. The information in this submittal shall be the same as listed in the requirement entitled "Remodeling Submittal".	Minn. Stat. Sec. 116.07, subds. 4a and 9; Minn. R. 7007.0100, subps. 7A, 7L, and 7M; Minn. R. 7007.0800, subps. 1, 2, and 4; Minn. R. 7009.0010-7009.0080
Fugitive Emissions: Do not cause or permit the handling, use, transporting, or storage of any material in a manner which may allow avoidable amounts of particulate matter to become airborne. Comply with all other requirements listed in Minn. R. 7011.0150.	Minn. R. 7011.0150
Noise: The Permittee shall comply with the noise standards set forth in Minn. R. 7030.0010 to 7030.0080 at all times during the operation of any emission units. This is a state only requirement and is not enforceable by the EPA Administrator or citizens under the Clean Air Act.	Minn. R. 7030.0010 - 7030.0080
Inspections: The Permittee shall comply with the inspection procedures and requirements as found in Minn. R. 7007.0800, subp. 9(A).	Minn. R. 7007.0800, subp. 9(A)
The Permittee shall comply with the General Conditions listed in Minn. R. 7007.0800, subp. 16.	Minn. R. 7007.0800, subp. 16
Performance Testing: Conduct all performance tests in accordance with Minn. R. ch. 7017 unless otherwise noted in Tables A, and B.	Minn. R. ch. 7017
Performance Test Notifications and Submittals:  Performance Tests are due as outlined in Table A 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. R. 7017.2018; Minn. R. 7017.2030, subps. 1-4, Minn. R. 7017.2035, subps. 1-2
Limits set as a result of a performance test (conducted before or after permit issuance) apply until superseded as stated in the MPCA's Notice of Compliance letter granting preliminary approval. Preliminary approval is based on formal review of a subsequent performance test on the same unit as specified by Minn. R. 7017.2025, subp. 3. The limit is final upon issuance of a permit amendment incorporating the change.	Minn. R. 7017.2025, subp. 3
<b>MONITORING REQUIREMENTS</b>	hdr
Monitoring Equipment Calibration: Annually calibrate all required monitoring equipment (any requirements applying to continuous emission monitors are listed separately in this permit).	Minn. R. 7007.0800, subp. 4(D)
Operation of Monitoring Equipment: Unless otherwise noted in Tables A, B, and/or C, monitoring a process or control equipment connected to that process is not necessary during periods when the process is shutdown, or during checks of the monitoring systems, such as calibration checks and zero and span adjustments. If monitoring records are required, they should reflect any such periods of process shutdown or checks of the monitoring system.	Minn. R. 7007.0800, subp. 4(D)
<b>RECORDKEEPING</b>	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)

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

10/26/11

Facility Name: Northern Natural Gas Co - Wrenshall LNG

Permit Number: 01700011 - 005

REPORTING/SUBMITTALS	hdr
<p>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.</p> <p>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.</p>	Minn. R. 7019.1000, subp. 3
<p>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.</p> <p>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.</p>	Minn. R. 7019.1000, subp. 2
Notification of Deviations Endangering Human Health or the Environment: As soon as possible after discovery, notify the Commissioner or the state duty officer, either orally or by facsimile, of any deviation from permit conditions which could endanger human health or the environment.	Minn. R. 7019.1000, subp. 1
<p>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:</p> <ol style="list-style-type: none"> <li>1. the cause of the deviation;</li> <li>2. the exact dates of the period of the deviation, if the deviation has been corrected;</li> <li>3. whether or not the deviation has been corrected;</li> <li>4. the anticipated time by which the deviation is expected to be corrected, if not yet corrected; and</li> <li>5. steps taken or planned to reduce, eliminate, and prevent reoccurrence of the deviation.</li> </ol>	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 on or before April 1 of each calendar year following permit issuance. To be submitted on a form approved by the Commissioner.	Minn. R. 7019.3000 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****A-4**

10/26/11

Facility Name: Northern Natural Gas Co - Wrenshall LNG

Permit Number: 01700011 - 005

**Subject Item: GP 001 Natural gas-fired Vaporizers****Associated Items:** EU 002 LNG Vaporizer

EU 003 LNG Vaporizer

EU 004 LNG Vaporizer

SV 002 LNG Vaporizer

SV 003 LNG Vaporizer

SV 004 LNG Vaporizer

What to do	Why to do it
Total Particulate Matter: less than or equal to 0.60 lbs/million Btu heat input . This limit applies separately to each unit in GP 001. The potential emissions for each unit is 0.0076 lb/MMBtu based on equipment design.	Minn. R. 7011.0510, subp. 1
Opacity: less than or equal to 20 percent opacity except for one six-minute period per hour of not more than 60 percent opacity. This limit applies separately to each unit in GP 001.	Minn. R. 7011.0510, subp. 2
Fuel Allowed: natural gas only	Minn. R. 7007.0800, subp. 2
Carbon Dioxide Equivalent: less than or equal to 55,000 tons/year using 12-month Rolling Sum for all Vaporizers (EU 002-EU004).	Title I Condition: To avoid classification as major source and modification under 40 CFR Section 52.21 & Minn. R. 7007.3000
Daily Recordkeeping: On each day of operation, the Permittee shall record the quantity of natural gas combusted from the GP001 units.	Title I Condition: To avoid classification as major source and modification under 40 CFR Section 52.21 & Minn. R. 7007.3000
Monthly Calculations: By the 15th day of each month, the Permittee shall calculate and record the carbon dioxide equivalent emissions for the previous calendar month, using the equation in Appendix D of this permit.	Title I Condition: To avoid classification as major source and modification under 40 CFR Section 52.21 & Minn. R. 7007.3000
Monthly Recordkeeping: By the 15th day of each month, calculate and record the 12-month rolling sum of carbon dioxide equivalent emissions calculated during each of the previous 12 months.	Title I Condition: To avoid classification as major source and modification under 40 CFR Section 52.21 & Minn. R. 7007.3000



**TABLE A: LIMITS AND OTHER REQUIREMENTS****A-5**

10/26/11

Facility Name: Northern Natural Gas Co - Wrenshall LNG

Permit Number: 01700011 - 005

**Subject Item:** EU 001 Flare**Associated Items:** CE 001 Flaring

SV 001 Flare

What to do	Why to do it
Total Particulate Matter: less than or equal to 0.30 grains/dry standard cubic foot of exhaust gas unless required to further reduce emissions to comply with the less stringent limit of either Minn. R. 7011.0730 or Minn. R. 7011. 0735.	Minn. R. 7011.0610, subp. 1(A)(1)
Opacity: less than or equal to 20 percent opacity except for one six-minute period per hour of not more than 60 percent opacity.	Minn. R. 7011.0610, subp. 1(A)(2)

**TABLE A: LIMITS AND OTHER REQUIREMENTS**

A-6

10/26/11

Facility Name: Northern Natural Gas Co - Wrenshall LNG

Permit Number: 01700011 - 005

**Subject Item:** EU 005 Natural Gas-Fired Turbine (ASP-021), 08/01/66**Associated Items:** SV 005 Natural Gas-Fired Turbine

What to do	Why to do it
Sulfur Dioxide: less than or equal to 0.50 lbs/million Btu heat input	Minn. R. 7011.2300, subp. 2
Opacity: less than or equal to 20 percent opacity once operating temperatures have been attained.	Minn. R. 7011.2300, subp. 1
Allowable Fuel: Fuel used is limited to natural gas meeting the definition in 40 CFR Section 60.331(u).	Minn. R. 7005.0100, subp. 35a
REQUIREMENTS FOR REPLACEMENTS MANUFACTURED AFTER OCTOBER 3, 1977	hdr
Sulfur Dioxide: less than or equal to 0.015 percent by volume at 15 percent oxygen and on a dry basis, or	40 CFR Section 60.333; Minn. R. 7011.2350
Sulfur Content of Fuel: less than or equal to 0.80 percent by weight.	
No owner or operator shall build, erect, install, or use any article, machine, equipment, or process, the use of which conceals an emission which would otherwise constitute a violation of an applicable standard.	40 CFR Section 60.12; Minn. R. 7011.0050
Recordkeeping: The Permittee shall maintain records of the occurrence and duration of any startup, shutdown, or malfunction in the operation of the facility including; any malfunction of the air pollution control equipment; or any periods during which a continuous monitoring system or monitoring device is inoperative.	40 CFR Section 60.7(b), Minn. R. 7019.0100, subp. 1
Excess Emissions Reporting: The Permittee shall submit reports of excess emissions and monitor downtime, in accordance with 40 CFR Section 60.7(c). Excess emissions shall be reported for all periods of unit operation, including startup, shutdown, and malfunction. For the purpose of reports under 60.7(c), periods of excess emissions and monitor downtime are as defined in 40 CFR Section 60.334(j)(1) through (5).	40 CFR Section 60.334(j); Minn. R. 7011.2350
Fuel Monitoring: The Permittee shall follow the applicable fuel sulfur and nitrogen content monitoring requirements in 40 CFR Section 60.334(h) and shall monitor at the frequency specified in 40 CFR Section 60.334(i).  40 CFR Section 60.334(h)(3) allows the owner or operator to not monitor total sulfur content of gaseous fuel if the fuel is shown to meet the definition of natural gas as defined in 40 CFR Section 60.331(u). 40 CFR Section 60.334(h)(2) allows the owner or operator to not monitor fuel nitrogen content if a NO <sub>x</sub> emission allowance (F') for fuel-bound nitrogen is claimed in the applicable equation in 40 CFR Section 60.332.	40 CFR Sections 60.334(h) and (i); Minn. R. 7011.2350
Replacement Combustion Turbine Compressor Engine (RCT): The Permittee may install and operate a pipeline natural gas-fired RCT at the facility as a permanent replacement for EU 005 (the RCT becomes EU 005 upon replacement). The RCT shall:  1. only be a similar unit not exceeding a rated heat input of 40.7 MMBtu/hr and a rated horse power of 4475 hp (at 60 degree F, sea level); 2. meet applicable emission limits and fuel requirements in this subject item; 3. meet the NO <sub>x</sub> limit in 40 CFR Section 60.332(a)(2) if initial construction or reconstruction (as defined in 40 CFR Section 60.15) of the RCT commenced on or after October 3, 1982; 4. exhaust through a stack with dispersion characteristics equal to or better than SV 005. Stack parameters are listed in Appendix C; and 5. have potential emission rates (in lb/hr) for all pollutants equal to or less than permit limits and potential emission rates of EU 005.	Title I Condition: to avoid classification as major source and modification under 40 CFR Section 52.21; Minn. R. 7007.3000
For each RCT, the Permittee shall:  1. conduct NO <sub>x</sub> testing as required by 40 CFR Sections 60.335 and 60.8, if initial construction or reconstruction of the RCT commenced on or after October 3, 1982, and NO <sub>x</sub> testing has not been conducted after the construction or reconstruction; and 2. notify the MPCA and the U.S. EPA Chicago office prior to making the replacement. The Permittee shall record the date of commencement of initial construction (the date the manufacturer first constructed the turbine; this is not the date of the last refurbishment/overhaul of the turbine) or reconstruction of the RCT.	Title I Condition: to avoid classification as major source and modification under 40 CFR Section 52.21; Minn. R. 7007.3000
PERFORMANCE TESTING REQUIREMENT	hdr

TABLE A: LIMITS AND OTHER REQUIREMENTS

Facility Name: Northern Natural Gas Co - Wrenshall LNG  
Permit Number: 01700011 - 005

Performance Test: due 180 days after Permit Issuance to determine emission factor for nitrogen oxides.  For additional applicable performance test requirements see "General Performance Test Requirements," in Table A, subject Item "Total Facility"	Minn. R. 7017.2020, subp. 1
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**TABLE A: LIMITS AND OTHER REQUIREMENTS****A-8**

10/26/11

Facility Name: Northern Natural Gas Co - Wrenshall LNG

Permit Number: 01700011 - 005

**Subject Item:** EU 006 Natural Gas-Fired Turbine (ASP-339), 11/01/73**Associated Items:** SV 006 Natural Gas-Fired Turbine

What to do	Why to do it
Sulfur Dioxide: less than or equal to 0.50 lbs/million Btu heat input	Minn. R. 7011.2300, subp. 2
Opacity: less than or equal to 20 percent opacity once operating temperatures have been attained.	Minn. R. 7011.2300, subp. 1
Allowable Fuel: Fuel use is limited to natural gas only, by design.	Minn. R. 7005.0100, subp. 35a
REQUIREMENTS FOR REPLACEMENTS MANUFACTURED AFTER OCTOBER 3, 1977	hdr
Sulfur Dioxide: less than or equal to 0.015 percent by volume at 15 percent oxygen and on a dry basis, or	40 CFR Section 60.333; Minn. R. 7011.2350
Sulfur Content of Fuel: less than or equal to 0.8 percent by weight.	
No owner or operator shall build, erect, install, or use any article, machine, equipment, or process, the use of which conceals an emission which would otherwise constitute a violation of an applicable standard.	40 CFR Section 60.12; Minn. R. 7011.0050
Recordkeeping: The Permittee shall maintain records of the occurrence and duration of any startup, shutdown, or malfunction in the operation of the facility including; any malfunction of the air pollution control equipment; or any periods during which a continuous monitoring system or monitoring device is inoperative.	40 CFR Section 60.7(b), Minn. R. 7019.0100, subp. 1
Excess Emissions Reporting: The Permittee shall submit reports of excess emissions and monitor downtime, in accordance with 40 CFR Section 60.7(c). Excess emissions shall be reported for all periods of unit operation, including startup, shutdown, and malfunction. For the purpose of reports under 60.7(c), periods of excess emissions and monitor downtime are as defined in 40 CFR Section 60.334(j)(1) through (5).	40 CFR Section 60.334(j); Minn. R. 7011.2350
Fuel Monitoring: The Permittee shall follow the applicable fuel sulfur and nitrogen content monitoring requirements in 40 CFR Section 60.334(h) and shall monitor at the frequency specified in 40 CFR Section 60.334(i).  40 CFR Section 60.334(h)(3) allows the owner or operator to not monitor total sulfur content of gaseous fuel if the fuel is shown to meet the definition of natural gas as defined in 40 CFR Section 60.331(u). 40 CFR Section 60.334(h)(2) allows the owner or operator to not monitor fuel nitrogen content if a NOx emission allowance (F) for fuel-bound nitrogen is claimed in the applicable equation in 40 CFR Section 60.332.	40 CFR Sections 60.334(h) and (i); Minn. R. 7011.2350
Replacement Combustion Turbine Compressor Engine (RCT): The Permittee may install and operate a pipeline natural gas-fired RCT at the facility as a permanent replacement for EU 006 (the RCT becomes EU 006 upon replacement). The RCT shall:  1. only be a similar unit not exceeding a rated heat input of 40.7 MMBtu/hr and a rated horse power of 4475 hp (at 60 degree F, sea level); 2. meet applicable emission limits and fuel requirements in this subject item; 3. meet the NOx limit in 40 CFR Section 60.332(a)(2) if initial construction or reconstruction (as defined in 40 CFR Section 60.15) of the RCT commenced on or after October 3, 1982; 4. exhaust through a stack with dispersion characteristics equal to or better than SV 006. Stack parameters are listed in Appendix C; and 5. have potential emission rates (in lb/hr) for all pollutants equal to or less than permit limits and potential emission rates of EU 006.	Title I Condition: to avoid classification as major source and modification under 40 CFR Section 52.21; Minn. R. 7007.3000
For each RCT, the Permittee shall:  1. conduct NOx testing as required by 40 CFR Sections 60.335 and 60.8, if initial construction or reconstruction of the RCT commenced on or after October 3, 1982, and NOx testing has not been conducted after the construction or reconstruction; and 2. notify the MPCA and the U.S. EPA Chicago office prior to making the replacement. The Permittee shall record the date of commencement of initial construction (the date the manufacturer first constructed the turbine; this is not the date of the last refurbishment/overhaul of the turbine) or reconstruction of the RCT.	Title I Condition: to avoid classification as major source and modification under 40 CFR Section 52.21; Minn. R. 7007.3000
PERFORMANCE TESTING REQUIREMENT	hdr

TABLE A: LIMITS AND OTHER REQUIREMENTS

Facility Name: Northern Natural Gas Co - Wrenshall LNG  
Permit Number: 01700011 - 005

Performance Test: due 180 days after Permit Issuance to determine emission factor for nitrogen oxides.  For additional applicable performance test requirements see "General Performance Test Requirements," in Table A, subject Item "Total Facility"	Minn. R. 7017.2020, subp. 1
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**TABLE A: LIMITS AND OTHER REQUIREMENTS****A-10**

10/26/11

Facility Name: Northern Natural Gas Co - Wrenshall LNG

Permit Number: 01700011 - 005

**Subject Item:** EU 007 Diesel-fired Fire Pump**Associated Items:** SV 007 Emergency Fire Pump

What to do	Why to do it
Opacity: less than or equal to 20 percent opacity once operating temperatures have been obtained. The averaging time for this limit is any ten consecutive seconds.	Minn. R. 7011.2300, subp. 1
Sulfur Dioxide: less than or equal to 0.5 lbs/million Btu heat input (met by equipment design - engine PTE based on AP-42 published emission factors is 0.29 lb/MMBtu).	Minn. R. 7011.2300, subp. 2
Fuel types allowed: Diesel fuel, by equipment design.	Minn. R. 7005.0100, subp. 35a
Hours of Operation: The Permittee shall maintain documentation on site that the unit is an emergency diesel generator by design that qualifies under the U.S. EPA memorandum entitled "Calculating Potential to Emit (PTE) for Emergency Generators" dated September 6, 1996, limiting operation to 500 hour per year.	Minn. R. 7007.0800, subp. 4 & 5
Recordkeeping: The Permittee shall record by the 15th day of each month, the type of fuel used in the engine.	Minn. R. 7007.0800, subp. 5
National Emission Standards for Hazardous Air Pollutants for Reciprocating Internal Combustion Engines (RICE) Requirements, 40 CFR pt. 63, subp. ZZZZ.	hdr
The Permittee must comply with the applicable operating limitations no later than October 19, 2013.	40 CFR Section 63.6595(a)(1); Minn. R. 7011.8150
EU007 must meet the following requirements, except during periods of startup:  1. change oil and filter every 500 hours of operation or annually, whichever comes first; 2. inspect spark plugs every 1,000 hours of operation or annually, whichever comes first; and 3. inspect all hoses and belts every 500 hours of operation or annually, whichever comes first, and replace as necessary.  Sources have the option to utilize an oil analysis program as described in 40 CFR Section 63.6625(i) in order to extend the specified oil change requirement. Sources can petition the Administrator pursuant to the requirements of 40 CFR Section 63.6(g) for alternative work practices.	40 CFR Section 63.6603(a); Minn. R. 7011.8150
The Permittee must at all times:  (a) Be in compliance with the operating requirements that apply to you. (b) Operate and maintain any affected source, including associated air pollution control equipment and monitoring equipment, in a manner consistent with safety and good air pollution control practices for minimizing emissions. The general duty to minimize emissions does not require you to make any further efforts to reduce emissions if levels required by this standard have been achieved. Determination of whether such operation and maintenance procedures are being used will be based on information available to the Administrator which may include, but is not limited to, monitoring results, review of operation and maintenance procedures, review of operation and maintenance records, and inspection of the source.	40 CFR Section 63.6605; Minn. R. 7011.8150
The Permittee must operate and maintain the stationary RICE and after-treatment control device (if any) according to the manufacturer's emission-related written instructions or develop your own maintenance plan which must provide to the extent practicable for the maintenance and operation of the engine in a manner consistent with good air pollution control practice for minimizing emissions.	40 CFR Section 63.6625(e); Minn. R. 7011.8150
The Permittee must minimize the engine's time spent at idle during startup and minimize the engine's startup time to a period needed for appropriate and safe loading of the engine, not to exceed 30 minutes, after which time the emission standards applicable to all times other than startup in 40 CFR Section 63.6602.	40 CFR Section 63.6625(h); Minn. R. 7011.8150
The Permittee must operate the emergency stationary RICE according to the requirements in (1)(i) through (iii) of 40 CFR Section 63.6640(f). Any operation other than emergency operation, maintenance and testing, and operation in non-emergency situations for 50 hours per year, as described in paragraphs (f)(1)(i) through (iii) of 40 CFR Section 63.6640(f), is prohibited. If you do not operate the engine according to the requirements in (1)(i) through (iii) of 40 CFR Section 63.6640(f), the engine will not be considered an emergency engine under this subpart and will need to meet all requirements for non-emergency engines. The requirements in (f)(1)(i) through (iii) are as follows:  (i) There is no time limit on the use of emergency stationary RICE in emergency situations.	40 CFR Section 63.6640(f)(1); Minn. R. 7011.8150

(continued below)

**TABLE A: LIMITS AND OTHER REQUIREMENTS****A-11**

10/26/11

Facility Name: Northern Natural Gas Co - Wrenshall LNG

Permit Number: 01700011 - 005

<p>(continued from above)</p> <p>(ii) You may operate your emergency stationary RICE for the purpose of maintenance checks and readiness testing, provided that the tests are recommended by Federal, State or local government, the manufacturer, the vendor, or the insurance company associated with the engine. Maintenance checks and readiness testing of such units is limited to 100 hours per year. The owner or operator may petition the Administrator for approval of additional hours to be used for maintenance checks and readiness testing, but a petition is not required if the owner or operator maintains records indicating that Federal, State, or local standards require maintenance and testing of emergency RICE beyond 100 hours per year.</p> <p>(iii) You may operate your emergency stationary RICE up to 50 hours per year in non-emergency situations, but those 50 hours are counted towards the 100 hours per year provided for maintenance and testing.</p> <p>(continued below)</p>	<p>40 CFR Section 63.6640(f)(1); Minn. R. 7011.8150</p>
<p>(continued from above)</p> <p>The 50 hours per year for non-emergency situations cannot be used for peak shaving or to generate income for a facility to supply power to an electric grid or otherwise supply power as part of a financial arrangement with another entity; except that owners and operators may operate the emergency engine for a maximum of 15 hours per year as part of a demand response program if the regional transmission organization or equivalent balancing authority and transmission operator has determined there are emergency conditions that could lead to a potential electrical blackout, such as unusually low frequency, equipment overload, capacity or energy deficiency, or unacceptable voltage level. The engine may not be operated for more than 30 minutes prior to the time when the emergency condition is expected to occur, and the engine operation must be terminated immediately after the facility is notified that the emergency condition is no longer imminent.</p> <p>(continued below)</p>	<p>40 CFR Section 63.6640(f)(1); Minn. R. 7011.8150</p>
<p>(continued from above)</p> <p>The 15 hours per year of demand response operation are counted as part of the 50 hours of operation per year provided for non-emergency situations. The supply of emergency power to another entity or entities pursuant to financial arrangement is not limited by 40 CFR Section 63.6640(f)(1)(iii), as long as the power provided by the financial arrangement is limited to emergency power.</p>	<p>40 CFR Section 63.6640(f)(1); Minn. R. 7011.8150</p>
<b>MONITORING AND COMPLIANCE REQUIREMENTS</b>	hdr
<p>The Permittee must install a non-resettable hour meter if one is not already installed.</p>	<p>40 CFR Section 63.6625(f); Minn. R. 7011.8150</p>
<p>The Permittee has the option of utilizing an oil analysis program in order to extend the specified oil change every 500 hours of operation or annually, whichever comes first. The oil analysis must be performed at the same frequency specified for changing the oil. The analysis program must at a minimum analyze the following three parameters: Total Base Number, viscosity, and percent water content. The condemning limits for these parameters are as follows: Total Base Number is less than 30 percent of the Total Base Number of the oil when new; viscosity of the oil has changed by more than 20 percent from the viscosity of the oil when new; or percent water content (by volume) is greater than 0.5. If all of these condemning limits are not exceeded, the engine owner or operator is not required to change the oil.</p> <p>(continued below)</p>	<p>40 CFR Section 63.6625(j); Minn. R. 7011.8150</p>
<p>(continued from above)</p> <p>If any of the limits are exceeded, the engine owner or operator must change the oil within 2 days of receiving the results of the analysis; if the engine is not in operation when the results of the analysis are received, the engine owner or operator must change the oil within 2 days or before commencing operation, whichever is later. The owner or operator must keep records of the parameters that are analyzed as part of the program, the results of the analysis, and the oil changes for the engine. The analysis program must be part of the maintenance plan for the engine.</p>	<p>40 CFR Section 63.6625(j); Minn. R. 7011.8150</p>

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

10/26/11

Facility Name: Northern Natural Gas Co - Wrenshall LNG

Permit Number: 01700011 - 005

<p>The Permittee must demonstrate continuous compliance with each emission limitation and operating limitation that apply to you according to methods specified below. The Permittee must demonstrate compliance with the Work or Management Practices as follows:</p> <p>(i) Operating and maintaining the stationary RICE according to the manufacturer's emission-related operation and maintenance instructions; or</p> <p>(ii) Develop and follow your own maintenance plan which must provide to the extent practicable for the maintenance and operation of the engine in a manner consistent with good air pollution control practice for minimizing emissions.</p>	40 CFR Section 63.6640(a); Minn. R. 7011.8150
RECORDKEEPING	hdr
<p>The Permittee shall keep records:</p> <p>(1) A copy of each notification and report that you submitted to comply with 40 CFR pt. 63, subp. ZZZZ, including all documentation supporting any Initial Notification or Notification of Compliance Status that you submitted, according to the requirement in 40 CFR Section 63.10(b)(2)(xiv).</p> <p>(2) Records of the occurrence and duration of each malfunction of operation (i.e., process equipment) or the air pollution control and monitoring equipment.</p> <p>(3) Records of all required maintenance performed on the air pollution control and monitoring equipment.</p> <p>(c) Records of actions taken during periods of malfunction to minimize emissions in accordance with 40 CFR Section 63.6605(b), including corrective actions to restore malfunctioning process and air pollution control and monitoring equipment to its normal or usual manner of operation.</p>	40 CFR Section 63.6655(a);40 CFR Section 63.6605(b) Minn. R. 7011.8150
The Permittee shall keep records of the Work or Management Practices required in Table 6 of 40 CFR pt. 63, subp. ZZZZ to show continuous compliance with each operating requirement that applies to you.	40 CFR Section 63.6655(d); Minn. R. 7011.8150
The Permittee shall keep records of the maintenance conducted on the stationary RICE in order to demonstrate that you operated and maintained the stationary RICE and after-treatment control device (if any) according to your own maintenance plan.	40 CFR Section 63.6655(e)(3); Minn. R. 7011.8150
The Permittee shall keep records of the hours of operation of the engine that is recorded through the non-resettable hour meter. The owner or operator must document how many hours are spent for emergency operation, including what classified the operation as emergency and how many hours are spent for non-emergency operation. If the engines are used for demand response operation, the owner or operator must keep records of the notification of the emergency situation, and the time the engine was operated as part of demand response.	40 CFR Section 63.6655(f)(1); Minn. R. 7011.8510
<p>The Permittee shall keep records as follows:</p> <p>1. Your records must be in a form suitable and readily available for expeditious review according to 40 CFR Section 63.10(b)(1).</p> <p>2. As specified in 40 CFR Section 63.10(b)(1), you must keep each record for 5 years following the date of each occurrence, measurement, maintenance, corrective action, report, or record.</p> <p>3. You must keep each record readily accessible in hard copy or electronic form for at least 5 years after the date of each occurrence, measurement, maintenance, corrective action, report, or record, according to 40 CFR Section 63.10(b)(1).</p>	40 CFR Section 63.6660;40 CFR Section 63.10(b)(1) Minn. R. 7011.8150
REPORTING REQUIREMENTS	hdr
The Permittee must report each instance in which you did not meet each operating requirement that applies to you. These instances are deviations from the emission and operating limitations in this subpart. These deviations must be reported according to the requirements in 40 CFR Section 63.6650.	40 CFR Section 63.6640(b); Minn. R. 7011.8150
Each affected source that has obtained a Title V operating permit pursuant to 40 CFR part 70 or 71 must report all deviations as defined in this subpart in the semiannual monitoring report required by 40 CFR Sections 70.6 (a)(3)(iii)(A) or 40 CFR 71.6(a)(3)(iii)(A).	40 CFR Section 63.6650(f); Minn. R. 7011.8150



TABLE A: LIMITS AND OTHER REQUIREMENTS

Facility Name: Northern Natural Gas Co - Wrenshall LNG  
Permit Number: 01700011 - 005

Subject Item: TK 001 LNG

Associated Items: CE 001 Flaring

What to do	Why to do it
The storage vessel shall be equipped with a vapor recovery system or its equivalent.	Minn. R. 7011.1505, subp. 3(C)(2)

**TABLE A: LIMITS AND OTHER REQUIREMENTS**

Facility Name: Northern Natural Gas Co - Wrenshall LNG  
Permit Number: 01700011 - 005

**Subject Item:** TK 002 Ethylene

**Associated Items:** CE 001 Flaring

What to do	Why to do it
The storage vessel shall be equipped with a permanent submerged fill pipe or shall comply with the requirements of Minn. R. 7011.1505, subp. 3(C).	Minn. R. 7011.1505, subp. 3(B)

TABLE A: LIMITS AND OTHER REQUIREMENTS

Facility Name: Northern Natural Gas Co - Wrenshall LNG  
Permit Number: 01700011 - 005

Subject Item: TK 003 Pentane

Associated Items: CE 001 Flaring

What to do	Why to do it
The storage vessel shall be equipped with a permanent submerged fill pipe or shall comply with the requirements of Minn. R. 7011.1505, subp. 3(C).	Minn. R. 7011.1505, subp. 3(B)

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

10/26/11

Facility Name: Northern Natural Gas Co - Wrenshall LNG

Permit Number: 01700011 - 005

**Subject Item:** TK 004 Butane**Associated Items:** CE 001 Flaring

What to do	Why to do it
Total Particulate Matter: less than or equal to 0.30 grains/dry standard cubic foot of exhaust gas unless required to further reduce emissions to comply with the less stringent limit of either Minn. R. 7011.0730 or Minn. R. 7011.0735.	Minn. R. 7011.0715, subp. 1(A)
Opacity: less than or equal to 20 percent	Minn. R. 7011.0715, subp. 1(B)

TABLE A: LIMITS AND OTHER REQUIREMENTS

Facility Name: Northern Natural Gas Co - Wrenshall LNG  
Permit Number: 01700011 - 005

Subject Item: TK 005 Propane

Associated Items: CE 001 Flaring

What to do	Why to do it
The storage vessel shall be equipped with a permanent submerged fill pipe or shall comply with the requirements of Minn. R. 7011.1505, subp. 3(C).	Minn. R. 7011.1505, subp. 3(B)

**TABLE B: SUBMITTALS****B-1** 10/26/11

Facility Name: Northern Natural Gas Co - Wrenshall LNG

Permit Number: 01700011 - 005

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

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

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 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 any application for a permit or permit amendment to:

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

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

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

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

TABLE B: ONE TIME SUBMITTALS OR NOTIFICATIONS

Facility Name: Northern Natural Gas Co - Wrenshall LNG  
Permit Number: 01700011 - 005

What to send	When to send	Portion of Facility Affected
Application for Permit Reissuance	due 180 days before expiration of Existing Permit	Total Facility

**TABLE B: RECURRENT SUBMITTALS****B-3** 10/26/11

Facility Name: Northern Natural Gas Co - Wrenshall LNG

Permit Number: 01700011 - 005

What to send	When to send	Portion of Facility Affected
Semiannual Deviations Report	due 30 days after end of each calendar half-year starting 10/11/2005. The first semiannual report submitted by the Permittee shall cover the calendar half-year in which the permit is issued. The first report of each calendar year covers January 1 - June 30. The second report of each calendar year covers July 1 - December 31. If no deviations have occurred, the Permittee shall submit the report stating no deviations.	Total Facility
Compliance Certification	due 31 days after end of each calendar year starting 10/11/2005 (for the previous calendar year). To be submitted on a form approved by the Commissioner, both to the Commissioner and to the US EPA regional office in Chicago. This report covers all deviations experienced during the calendar year.	Total Facility



## APPENDIX B: Insignificant Activities and General Applicable Requirements

Facility Name: Northern Natural Gas Company - Wrenshall LNG

Permit Number: 01700011-005

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

Minn. R. 7007.1300, subp.	Rule Description of the Activity	General Applicable Requirement
3(A)	Fuel use: space heaters fueled by kerosene, natural gas, or propane, if the combined total capacity of all space heaters at the stationary source is less than or equal to 420,000 Btu per hour. <i>Natural gas-fired space heaters with a total rated heat input of 0.040 MMBtu/hour</i>	Minn. R. 7011.0510/0515
3(H)(2)	Equipment used for hydraulic or hydrostatic testing <i>Equipment for hydraulic and hydrostatic testing.</i>	Minn. R. 7011.0710/0715
3(H)(3)	Brazing, soldering, and welding <i>Welding equipment.</i>	Minn. R. 7011.0510/0515; Minn. R. 7011.0610 and Minn. R. 7011.0710/0715
3(J)	Fugitive emissions from unpaved roads and parking lots <i>Unpaved roads and a parking lot.</i>	Minn. R. 7011.0150
3(K)	Infrequent use of spray painting equipment for routine housekeeping or plant upkeep activities not associated with primary production processes <i>Equipment for maintenance painting of piping, emission stacks, and other equipment.</i>	Minn. R. 7011.0710/0715
4	Individual emissions units at a stationary source, each of which has:  A. Potential emissions of 5.7 pounds per hour or actual emissions of two tons per year of carbon monoxide;  B. Potential emissions of 2.28 pounds per hour or actual emissions of one ton per year for particulate matter, particulate matter less than ten microns, nitrogen oxide, sulfur dioxide, and VOCs; and  C. For hazardous air pollutants, emissions units with:  (1) potential emissions of 25 percent or less of the hazardous air pollutant thresholds listed in subp. 5; or	Minn. R. 7011.0710/0715

Minn. R. 7007.1300, subp.	Rule Description of the Activity	General Applicable Requirement
	<p>(2) combined HAP actual emissions of one ton per year unless the emissions unit emits one or more of the HAPs listed in this subpart.</p> <p>D. Potential emissions up to 10,000 tons per year or actual emissions up to 1,000 per year CO<sub>2</sub>e.</p> <p><i>A small portable generator. This engine emits less than the thresholds.</i></p>	

**Appendix C: Turbine Stack Parameters Relied Upon to Demonstrate Compliance with  
National Ambient Air Quality Standards (NAAQS)**

Facility Name: Northern Natural Gas Company - Wrenshall LNG

Permit Number: 01700011-005

Source ID	Stack/Vent ID	Stack Height (feet)	Stack Temp (°F)	Flow Rate (acfm)	Stack Diameter (feet)
EU 005	SV 005	55.00	750.0	81,500	3.3 x 4
EU 006	SV 006	55.00	750.0	81,500	3.3 x 4

## Appendix D: GP001 CO<sub>2</sub>e Calculation Equations

Facility Name: Northern Natural Gas Co – Wrenshall LNG Plant

Permit Number: 01700011-005

Use the following equations to calculate Carbon Dioxide Equivalent (CO<sub>2</sub>e) emissions for compliance with the GP001 CO<sub>2</sub>e limit.

$$\text{CO}_2\text{e} = [\text{CH}_{4(\text{NG})} \times \text{GWP}_{\text{CH}_4}] + [\text{N}_2\text{O}_{(\text{NG})} \times \text{GWP}_{\text{N}_2\text{O}}] + \text{CO}_{2(\text{NG})}$$

CO<sub>2</sub>e<sub>(12)</sub> = the sum of the values of CO<sub>2</sub>e calculated over the previous 12 calendar months (12- month rolling sum)

$$\text{CH}_{4(\text{NG})} = Q_{\text{NG}} \times \text{EF}_{\text{CH}_4\text{-NG}} \div 2000$$

$$\text{N}_2\text{O}_{(\text{NG})} = Q_{\text{NG}} \times \text{EF}_{\text{N}_2\text{O-NG}} \div 2000$$

$$\text{CO}_{2(\text{NG})} = Q_{\text{NG}} \times \text{EF}_{\text{CO}_2\text{-NG}} \div 2000$$

Where:

- CO<sub>2</sub>e = the quantity of CO<sub>2</sub>e emitted during the previous calendar month (tons)
- CH<sub>4(NG)</sub> = the quantity of methane generated by combustion of natural gas during the previous month (tons)
- N<sub>2</sub>O<sub>(NG)</sub> = the quantity of nitrous oxide generated by combustion of natural gas during the previous month (tons)
- Q<sub>NG</sub> = the quantity of natural gas combusted during the previous calendar month (mmcf)
- EF<sub>CH<sub>4</sub>-NG</sub> = the MPCA-approved emission factor for calculating methane emissions from combustion of natural gas. At the time of permit issuance, the MPCA-approved emission factor is 2.27 lb/mmcf.<sup>1</sup> If testing is done, and use of the tested values would result in a higher CH<sub>4</sub> emission factor, the higher emission factor should be used. If testing results in a lower CH<sub>4</sub> emission factor, the emission factor in the permit (the higher factor) should be used until a permit amendment is issued authorizing use of the lower emission factor. If Table C-2 to Subpart C of 40 CFR Part 98 is changed to reflect a different emission factor, the revised emission factor should be used in the derivation of the emission factor used herein.
- EF<sub>N<sub>2</sub>O-NG</sub> = The MPCA-approved emission factor for calculating nitrous oxide emissions from combustion of natural gas. At the time of permit issuance, the MPCA-approved emission factor is 0.227 lb/mmcf.<sup>2</sup> If testing is done, and use of the tested values would result in a higher N<sub>2</sub>O emission factor, the higher emission factor should be used. If testing results in a lower N<sub>2</sub>O emission factor, the emission factor in the permit (the higher factor) should be used until a permit amendment is issued authorizing use of the lower emission factor. If Table C-2 to Subpart C of 40 CFR Part 98 is changed to reflect a different emission factor, the revised emission factor should be used in the derivation of the emission factor used herein.
- EF<sub>CO<sub>2</sub>-NG</sub> = The MPCA-approved emission factor for calculating carbon dioxide emissions from combustion of natural gas. At the time of permit issuance, the MPCA-approved emission factor is 120161.8 lb/mmcf.<sup>2</sup> If testing is done, and use of the tested values would result in a higher CO<sub>2</sub> emission factor, the higher emission factor should be used. If testing results in a lower CO<sub>2</sub> emission factor, the emission factor in the permit (the higher factor) should be used until a permit amendment is issued authorizing use of the lower emission factor. If Table C-1 to Subpart C of 40 CFR Part 98 is changed to reflect a different emission factor, the revised emission factor should be used in the derivation of the emission factor used herein.

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<sup>1</sup> Converted from the value provided in Table C-2 to Subpart C of 40 CFR Part 98 (0.001 kg/MMBtu), using conversion factors of 0.001028 MMBtu/ft<sup>3</sup> and 2.20462 kg/lb

<sup>2</sup> Converted from the value provided in Table C-1 to Subpart C of 40 CFR Part 98 (0.001 kg/MMBtu), using conversion factors of 0.001028 MMBtu/ft<sup>3</sup> and 2.20462 kg/lb

- $GWP_{CH_4}$  = The global warming potential of methane (unitless). At the time of permit issuance, the GWP of methane is 21.<sup>3</sup> If Subpart A of 40 CFR Part 98 is changed to reflect a different GWP, the revised GWP should be used.
- $GWP_{N_2O}$  = The global warming potential of nitrous oxide (unitless). At the time of permit issuance, the GWP of nitrous oxide is 310.<sup>6</sup> If Subpart A of 40 CFR Part 98 is changed to reflect a different GWP, the revised GWP should be used.



**TECHNICAL SUPPORT DOCUMENT**  
**For**  
**AIR EMISSION PERMIT NO. 01700011-005**

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

**1. General Information**

**1.1 Applicant and Stationary Source Location:**

**Table 1. Applicant and Source Address**

<b>Applicant/Address</b>	<b>Stationary Source/Address (SIC Code: 4922)</b>
Northern Natural Gas Company 1120 Centre Pointe Drive, Suite 400 Mendota Heights, MN 55120	Northern Natural Gas Company – Wrenshall LNG 2301 County Road 1 Wrenshall, MN 55797 Carlton County
Contact: Dave Nickel, Division Environmental Specialist Phone: (651) 456-1712	

**1.2 Facility Description**

The facility is a liquid natural gas plant on County Road 1 near Wrenshall, Minnesota. The Wrenshall LNG station is used to liquefy and store natural gas for later vaporization and distribution into the underground natural gas pipelines as needed. The facility consists of a compressor/turbine building which houses two natural gas-fired turbines (both are Allison 501-KB turbines rated at 4,475 horsepower), three natural gas-fired vaporizers (all three are Ryan 75-100 vaporizer units rated at 72.7 MMBtu/hr each), a 26,460,000 gallon LNG storage tank, a 11,700 gallon Ethylene storage tank, a 5,900 gallon Pentane storage tank, a 2,000 gallon Butane storage tank, a 4,050 gallon Propane storage tank, a small natural gas flare which is used to combust excess gasses from the tank, and a diesel-fired fire pump (a Cummins N-855-5 engine rated at 192 horsepower). The primary emissions are nitrogen oxides (NO<sub>x</sub>), carbon monoxide (CO), and greenhouse gases (CO<sub>2</sub>e) from the turbines, vaporizers, and reciprocating engine. Combustion emissions are not controlled. The facility also has equipment that qualifies as insignificant activities under Minn. R. 7007.1300, subparts 3 and 4.

### 1.3 Description of any Changes Allowed with this Permit Issuance

In this permit reissuance, EU 005 is replaced with a gas generator and power turbine of the same model as the existing generator/turbine. On 9/23/08, existing EU 005 (Serial Number ASP 339, built in November 1973) was replaced with the same model gas generator and power turbine (Serial Number ASP 021, built in August 1966). Also in this permit reissuance, EU 006 is replaced with a gas generator and power turbine of the same model as the existing generator/turbine. On 1/23/09, existing EU 006 (Serial Number ASP 798, built in March 1980) was replaced with the same model gas generator and power turbine (Serial Number ASP 339, built in November 1973). Federal NESHAP requirements for the emergency fire pump engine have been added. The permit was updated to reflect current MPCA templates and standard citation formatting.

In addition, a limit on greenhouse gas emissions (as carbon dioxide equivalent, CO<sub>2</sub>e) was added to the permit (GP001), because the Permittee wishes to remain a non-major source under New Source Review.

### 1.4 Description of All Amendments Issued Since the Issuance of the Last Total Facility Permit and to be included in the Part 70 Permit

No amendments have been issued since the reissuance of the Total Facility Operating Permit (permit number 01700011- 004) on October 11, 2005.

### 1.5 Facility Emissions:

Table 2. Total Facility Potential to Emit Summary

	PM tpy	PM <sub>10</sub> tpy	PM <sub>2.5</sub> tpy	SO <sub>2</sub> tpy	NO <sub>x</sub> tpy	CO tpy	CO <sub>2</sub> e tpy	VOC tpy	Single HAP tpy	All HAPs tpy
Total Facility Limited Potential Emissions	5.8	5.8	5.8	23	160	67	96,000	3.3	0.29	1.2
Total Facility Actual Emissions (2008)	1.7	1.7	*	0.78	75	20	*	0.58	*	

\*Not reported currently in the emission inventory



**Table 3. Facility Classification**

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

\*Existing equipment is true minor source for NO<sub>x</sub>; permit authorizes replacement and those provisions include limits on the replacement to keep the source minor for NO<sub>x</sub> emissions only.

## 2. Regulatory and/or Statutory Basis

### New Source Review

The Facility has taken limits to avoid major source classification for New Source Review (40 CFR § 52.21) due to federally enforceable conditions contained in the permit.

The requirements for NO<sub>x</sub> emissions apply to turbines EU 005 and EU 006 and are as follows:

Replacement Combustion Turbine Compressor Engine (RCT): The Permittee may install and operate a pipeline natural gas-fired RCT at the facility as a permanent replacement for EU 005 and EU 006: RCT shall meet the following below:

1. only be a similar unit not exceeding a rated heat input of 40.7 MMBtu/hr and a rated horse power of 4475 hp (at 60 degree F, sea level);
2. meet applicable emission limits and fuel requirements in this subject item;
3. meet the NO<sub>x</sub> limit in 40 CFR Section 60.332(a)(2) if initial construction or reconstruction (as defined in 40 CFR Section 60.15) of the RCT commenced on or after October 3, 1982;
4. exhaust through a stack with dispersion characteristics equal to or better than SV 005 or SV 006. Stack parameters are listed in Appendix C in the permit; and
5. have potential emission rates (in lb/hr) for all pollutants equal to or less than permit limits and potential emission rates of EU 005 or EU 006.

For each RCT, the Permittee shall:

- a. conduct NO<sub>x</sub> testing as required by 40 CFR Sections 60.335 and 60.8, if initial construction or reconstruction of the RCT commenced on or after October 3, 1982, and NO<sub>x</sub> testing has not been conducted after the construction or reconstruction; and
- b. notify the MPCA and the U.S. EPA Chicago office prior to making the replacement. The Permittee shall record the date of commencement of initial construction (the date the manufacturer first constructed the turbine; this is not the date of the last refurbishment/overhaul of the turbine) or reconstruction of the RCT.

## Part 70 Permit Program

The facility is a major source under the Part 70 permit program.

## New Source Performance Standards (NSPS)

There are no New Source Performance Standards applicable to the operations at this facility.

### 40 CFR Part 60, Subpart GG - Standards of Performance for Stationary Gas Turbines

The requirements of 40 CFR Part 60, Subpart GG - Standards of Performance for Stationary Gas Turbines, are not applicable to the natural gas-fired turbines (EU 005 and EU 006) at this source because these two turbines commenced construction prior to October 3, 1977 and have not been reconstructed or modified since that time.

Pursuant to an EPA Region 10 Applicability Determination entitled "40 CFR part 60, Subpart GG, Applicability Determination", authored by Jeff KenKnight and dated August 1, 2002, a turbine that is manufactured prior to October 3, 1977 and rotated into service after that date is not subject to Subpart GG, provided the turbines have not been "modified" or "reconstructed", as defined in NSPS Subpart A, on or after October 3, 1977. Attachment III to this TSD contains the August 1, 2002, Applicability Determination.

Turbine EU 005 (Serial Number ASP 339) was manufactured in November 1973 and is not subject to the requirements of Subpart GG. On September 23, 2008, the Permittee replaced this turbine with the same model gas generator and power turbine (Serial Number ASP 021) manufactured in August 1966. This replacement turbine will also be designated "EU 005" in the permit.

Turbine EU 006 (Serial Number ASP 798) was manufactured in 1980 and is subject to the requirements of Subpart GG. On January 23, 2009, the Permittee replaced this turbine with the same model gas generator and power turbine (Serial Number ASP 339) manufactured in November 1973. This replacement turbine will also be designated "EU 006" in the permit.

The requirements for NSPS Subpart GG currently in the permit will remain in the permit, as the Permittee may choose to replace one of the existing turbines with a similar make and model turbine manufactured after October 3, 1977. Doing so would not require a major permit amendment.

### 40 CFR Part 60, Subpart IIII - Standards of Performance for Stationary Compression Ignition Internal Combustion Engines

The requirements of 40 CFR Part 60, Subpart IIII - Standards of Performance for Stationary Compression Ignition Internal Combustion Engines, are not applicable to the diesel-fired emergency fire pump engine (EU 007) and the insignificant diesel-fired portable generator at this source because, pursuant to 40 CFR 60.4200(a)(2)(ii), this fire pump engine and this portable generator were both manufactured prior to July 1, 2006.

### 40 CFR Part 60, Subpart KKKK - Standards of Performance for Stationary Combustion Turbines

The requirements of 40 CFR Part 60, Subpart KKKK - Standards of Performance for Stationary Combustion Turbines, are not applicable to the two natural gas-fired turbines (EU 005 and EU 006) at this source because, pursuant to 40 CFR 60.4305(a), these turbines were constructed prior to February 18, 2005, and have not been modified or reconstructed since that time. Pursuant to an EPA Region 10 Applicability Determination entitled "Gas Turbine Definition and Modification Issues" authored by Jeff KenKnight and dated September 8, 2003, replacement of a turbine with a similar make and model turbine does not constitute "construction" as defined in the NSPS. Since the replacement of each of the turbines does not exceed 50% of the fixed capital costs of a new turbine, the replacement does not constitute a "reconstruction", as defined in the NSPS. Since the replacement of these turbines do not result in an increase in emissions of any pollutant to which a standard applies, the replacement does not constitute a "modification", as defined in the NSPS. Attachment IIII to this TSD contains the September 8, 2003, Applicability Determination.

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

The facility is not a major source under 40 CFR Part 63 because the potential to emit of any single HAP from this source is less than 10 tons per year and the potential to emit of a combination of HAPs is less than 25 tons per year.

This source is an area source under 40 CFR Part 63 because there are emissions of HAPs.

#### 40 CFR Part 63, Subpart HHH - National Emission Standards for Hazardous Air Pollutants From Natural Gas Transmission and Storage Facilities

Pursuant to 40 CFR 63.1270(a), the facility is not subject to the requirements of 40 CFR Part 63, Subpart HHH because it is not a major source of HAPs. The facility does not currently have any glycol dehydration units. Pursuant to 40 CFR 63.1270(c), since this facility does not contain an affected source [a glycol dehydration unit], it is not subject to the requirements of this subpart.

#### 40 CFR Part 63, Subpart YYYY - National Emission Standards for Hazardous Air Pollutants for Stationary Combustion Turbines

Pursuant to 40 CFR 63.6085, the two stationary combustion turbines at this source (EU 005 and EU 006) are not subject to the requirements of 40 CFR 63, Subpart YYYY because they are not located at a major source of HAP emissions.

#### 40 CFR Part 63, Subpart ZZZZ- National Emissions Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines:

The source is subject to the requirements of 40 CFR Part 63, Subpart ZZZZ- National Emissions Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines (RICE) because, pursuant to 40 CFR 63.6585, the Permittee owns or operates a stationary RICE at an area source of HAP emissions.

EU007 is a diesel-fired emergency fire pump engine with a rating of 192 brake horsepower. Pursuant to 40 CFR 63.6590(a)(1)(iii), this stationary RICE is an existing stationary RICE

subject to the requirements of 40 CFR Part 63, Subpart ZZZZ- National Emissions Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines (RICE) because it: is located at a area source of HAP emissions, commenced construction prior to June 12, 2006, and has not been reconstructed since that time.

The insignificant diesel-fired portable generator engine is not an affected source subject to the requirements of 40 CFR Part 63, Subpart ZZZZ- National Emissions Standards for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines (RICE) because, pursuant to 40 CFR 63.6585(a) and 40 CFR 63.6590(a), this engine is not a stationary engine.

40 CFR Part 63, Subpart DDDDD - National Emission Standards for Hazardous Air Pollutants for Industrial, Commercial, and Institutional Boilers and Process Heaters

This source is not a major source of HAP. Pursuant to 40 CFR 63.7485 and 40 CFR 63.7490(a)(1), the three LNG Vaporizers (EU002, EU003, and EU004) are not subject to the requirements of 40 CFR Part 63, Subpart DDDDD.

40 CFR Part 63, Subpart JJJJJ - National Emission Standards for Hazardous Air Pollutants for Industrial, Commercial, and Institutional Boilers Area Sources

This source is an area source of HAP. Pursuant to 40 CFR 63.11195, the three LNG Vaporizers (EU002, EU003, and EU004) are not subject to the requirements of 40 CFR Part 63, Subpart JJJJJ.

#### Compliance Assurance Monitoring (CAM)

Since no control equipment is utilized to meet applicable emission limits, CAM does not apply.

#### Environmental Review & AERA

No new significant emission units are being added in this permit action, and emissions of pollutants are not expected to increase. Therefore, this permit reissuance is not subject to environmental review and is not required to perform an Air Emissions Risk Analysis (AERA).

#### Minnesota State Rules

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

- Minn. R. 7011.0510 Standards of Performance for Existing Indirect Heating Equipment
- Minn. R. 7011.0610 Standards of Performance for Fossil-Fuel-Burning Direct Heating Equipment
- Minn. R. 7011.0715 Standards of Performance for Post-1969 Industrial Process Equipment
- Minn. R. 7011.1505 Standards of Performance for Storage Vessels, Post-June 11, 1973.
- Minn. R. 7011.2300 Standards of Performance for Stationary Internal Combustion Engines
- Minn. R. 7011.2350 Standards of Performance for Stationary Gas Turbines

**Table 4. Regulatory Overview of Facility**

<b>Level*</b>	<b>Applicable Regulations</b>	<b>Comments:</b>
Total Facility (TF)	Minn. R. chs. 7002, 7007, 7009, 7019, 7030	Table A of this permit contains some requirements that apply to some facilities in Minnesota. Reporting and monitoring requirements are contained in Table B of this permit.
TF	40 CFR pt. 50; Minn. R. Stat. Section 116.07; Minn. R. 7007.0100; Minn. R. 7009.0010-7009. 0080	Modeling requirements to ensure that emissions do not cause a violation of the national ambient air quality standards (NAAQS)
EU 001	Minn. R. 7011.0610	Natural Gas Flare Standards of Performance for Fossil Fuel-Burning Direct Heating Equipment. Because the facility is located outside of Minneapolis/St. Paul and combusts gaseous fuel, the SO <sub>2</sub> limit from the rule does not apply.
GP 001 (EU 002, EU 003, EU 004)	Title I limits to avoid 52.21 major source status	The facility has accepted a limit on greenhouse gas emissions, calculated as CO <sub>2</sub> e, to maintain emissions below major source thresholds for NSR
GP 001 (EU 002, EU 003, EU 004)	Minn. R. 7011.0510	LNG Vaporizers Standards of Performance for Existing Indirect Heating Equipment. Determination of applicable limit from rule: <ul style="list-style-type: none"> <li>the units were constructed in 1974 and 1975;</li> <li>the facility is located outside the cities in Table I;</li> <li>each unit capacity is less than 250 MMBtu/hr; and</li> <li>the facility has less than 250 MMBtu/hr of indirect heating equipment.</li> </ul>
EU 005	Minn. R. 7011.2300	Gas-Fired Turbine Minnesota Standard of Performance for Stationary Internal Combustion Engines. This rule applies in addition to the NSPS.
	40 CFR pt. 60, subp. GG; Minn. R.	New Source Performance Standard for Stationary Gas Turbines.

	7011.2350	The current turbine was constructed in 1966 and is not subject to this standard; however, the permit authorizes the replacement of this unit, so the replacement may be subject to it in the future. Therefore, the NSPS is included in the permit.
	Title I Condition, 40 CFR § 52.21	Prevention of Significant Deterioration (PSD). Limits taken to avoid major source and modification classification under PSD for the replacement turbine. Without these permit conditions, replacing the turbine would likely make the facility a major source under NSR. This authorization is carried forward from the previous permit.
EU 006	Minn. R. 7011.2300	Gas-Fired Turbine Minnesota Standard of Performance for Stationary Internal Combustion Engines. This rule applies in addition to the NSPS.
	40 CFR pt. 60, subp. GG; Minn. R. 7011.2350	New Source Performance Standard for Stationary Gas Turbines. The current turbine was constructed in 1973 and is not subject to this standard; however, the permit authorizes the replacement of this unit, so the replacement may be subject to it in the future. Therefore, the NSPS is included in the permit.
	Title I Condition, 40 CFR § 52.21	Prevention of Significant Deterioration (PSD). Limits taken to avoid major source and modification classification under PSD for the replacement turbine. Without these permit conditions, replacing the turbine would likely make the facility a major source under NSR. This authorization is carried forward from the previous permit.
EU007	Minn. R. 7011.2300	Fire Pump Engine Standards of Performance for Stationary Internal Combustion Engines – opacity and SO <sub>2</sub> Burning pipeline-quality diesel fuel; therefore no additional compliance demonstration required
TK 001	Minn. R. 7011.1505, subp. 3(C)(2)	Standards of Performance for Storage Vessels, Post-June 11, 1973. The tank has a capacity greater than 40,000 gallons and stores materials that meet the vapor pressure

		requirements of subp. 3(C)(2) of this standard.
TK 002	Minn. R. 7011.1505, subp. 3(B)	Standards of Performance for Storage Vessels, Post-June 11, 1973. The tank has a capacity greater than 2,000 gallons and stores materials that meet the vapor pressure requirements of subp. 3(C)(2) of this standard.
TK 003	Minn. R. 7011.1505, subp. 3(B)	Standards of Performance for Storage Vessels, Post-June 11, 1973. The tank has a capacity greater than 2,000 gallons and stores materials that meet the vapor pressure requirements of subp. 3(C)(2) of this standard.
TK 004	Minn. R. 7011.0715	Standards of Performance for Post 1969 Industrial Process Equipment (IPER). This tank has a capacity is less than or equal to 2,000 gallons, so it is not subject to the Minnesota Standard for Storage Vessels. Absent a separate standard, IPER applies.
TK 005	Minn. R. 7011.1505, subp. 3(B)	Standards of Performance for Storage Vessels, Post-June 11, 1973. The tank has a capacity greater than 2,000 gallons and stores materials that meet the vapor pressure requirements of subp. 3(C)(2) of this standard.

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

### 3. Technical Information

#### 3.1 Calculations of Potential to Emit

Attachment I to this TSD contains detailed spreadsheets and supporting information prepared by the MPCA based on information provided by the Permittee. All emissions calculations are based on EPA approved emissions factors from AP-42 or manufacturer's data, fuels burned, and equipment capacity.

The tank emissions are accounted for in the emissions factors for the flare (EU 001), so they are not calculated or listed separately.

#### 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 5 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**

Emission Unit or Group	Requirement (basis)	Additional Monitoring	Discussion
EU 001	PM: variable, depending on airflow Opacity: $\leq 20\%$ with exceptions (Minn. R. 7011.0610)	None	EU001 is a flare burning gaseous emissions from the tanks. Based on AP-42, the PTE of the flare is less than 6% of the allowable emissions rate. Therefore, it is highly unlikely that it could violate the applicable requirement.
GP 001 (EU 002, EU 003, EU 004)	CO <sub>2</sub> e: $\leq 55,000$ tpy on a 12-month rolling sum basis (Title I limit)	Daily recordkeeping of fuel usage  Monthly calculation of 12-month rolling sum	The only permitted fuel is natural gas. This limit will be adequate for the source to maintain minor status for greenhouse gases.
GP 001 (EU 002, EU 003, EU 004)	PM: $\leq 0.60$ lb/MMBtu Opacity $\leq 20\%$ with exceptions (Minn. R. 7011.0510)	None	EU002, EU003, and EU004 all burn pipeline natural gas. The AP-42 emission factor for PM is 0.0076 lb PM/MMBtu compared to the rule limit of 0.60 lb PM/MMBtu. Natural gas is a clean-burning fuel. Therefore, the likelihood of violating either of the emission limits is very small.
EU 005	SO <sub>2</sub> $\leq 0.50$ lb/MMBtu Opacity $\leq 20\%$ with	None	EU005 is a turbine burning pipeline natural gas. EPA defines "pipeline quality natural gas" as having a sulfur content of 0.5 grains



Emission Unit or Group	Requirement (basis)	Additional Monitoring	Discussion
	exceptions (Minn. R. 7011.2300)		per 100 standard cubic feet. Based on AP-42 and natural gas sulfur content, the PTE of the unit is significantly less than the rule limit. Natural gas is a clean-burning fuel. Therefore, it is highly unlikely that it could violate the applicable requirements.
EU 005	$\text{SO}_2 \leq 0.015\%$ by vol or $\text{Sulfur} \leq 0.80\%$ by wt  Fuel monitoring requirements for sulfur and nitrogen content  Various restrictions on replacement turbine (limits to avoid triggering NSR major source)	NSPS sulfur emission standards  NSPS fuel monitoring requirements  Testing and notification	<p>The turbine is not subject to the NSPS (40 CFR 60, Subpart GG) (see Table 4). However, the permit authorizes the replacement of this turbine, so the replacement may be subject to the NSPS in the future. Therefore, the NSPS is included in the permit.</p> <p>The turbine uses pipeline-quality natural gas as fuel. PTE calculations indicate it is unlikely the turbine could violate the applicable requirement.</p> <p>At this time, the Permittee does not have an EPA-approved custom fuel monitoring schedule and intends to follow the requirements in 40 CFR § 60.334(h), when applicable.</p> <p>If the replacement is subject to the NSPS requirements, those provisions of the permit would apply. The permit requires a notification of the replacement be sent to the MPCA as well as EPA.</p> <p>Performance testing was added to determine the emission factor for NO<sub>x</sub>.</p>
EU 006	$\text{SO}_2 \leq 0.50$ lb/MMBtu $\text{Opacity} \leq 20\%$ with exceptions (Minn. R. 7011.2300)	None	EU006 is a turbine burning pipeline natural gas. EPA defines “pipeline quality natural gas” as having a sulfur content of 0.5 grains per 100 standard cubic feet. Based on AP-42 and natural gas sulfur content, the PTE of the unit is significantly less than the rule limit. Natural gas is a clean-burning fuel. Therefore, it is highly unlikely that it could violate the applicable requirements.
EU 006	$\text{SO}_2 \leq 0.015\%$ by vol or	NSPS sulfur emission	The turbine is not subject to the NSPS (40 CFR 60, Subpart GG) (see Table 4).

Emission Unit or Group	Requirement (basis)	Additional Monitoring	Discussion
	<p>Sulfur <math>\leq</math> 0.80% by wt</p> <p>Fuel monitoring requirements for sulfur and nitrogen content</p> <p>Various restrictions on replacement turbine (limits to avoid triggering NSR major source)</p>	<p>standards</p> <p>NSPS fuel monitoring requirements</p> <p>Testing and notification</p>	<p>However, the permit authorizes the replacement of this turbine, so the replacement may be subject to the NSPS in the future. Therefore, the NSPS is included in the permit.</p> <p>The turbine uses pipeline-quality natural gas as fuel. PTE calculations indicate it is unlikely the turbine could violate the applicable requirement.</p> <p>At this time, the Permittee does not have an EPA-approved custom fuel monitoring schedule and intends to follow the requirements in 40 CFR § 60.334(h), when applicable.</p> <p>If the replacement is subject to the NSPS requirements, those provisions of the permit would apply. The permit requires a notification of the replacement be sent to the MPCA as well as EPA.</p> <p>Performance testing was added to determine the emission factor for NOx.</p>
EU007	<p>SO<sub>2</sub> <math>\leq</math> 0.50 lb/MMBtu</p> <p>Opacity <math>\leq</math> 20 % with exceptions (Minn. R. 7011.2300)</p>	None	<p>This engine burns diesel fuel. The AP-42 emission factor for EU007 is 0.29 lb SO<sub>2</sub>/MMBtu fuel input. The PTE of this emission unit is less than the rule limit; therefore, it is unlikely that this engine could violate the applicable requirement.</p>
TK 001-003, 005	Requirement to have vapor recovery system, or other option as allowed by rule	None	<p>All tanks are controlled by the flare and meet the requirements for having a vapor recovery system.</p>
TK 004	<p>PM: variable, depending on airflow</p> <p>Opacity: <math>\leq</math> 20% (Minn. R. 7011.0715)</p>	None	<p>This rule applies as a default since no other standard applies. The tank is not reasonably expected to generate particulate matter or opacity.</p>

### 3.3 Permit Organization

The permit meets the MPCA Delta Guidance for ordering and grouping of requirements.

### 3.4 Insignificant Activities

Northern Natural Gas Company – Wrenshall LNG has several operations which are classified as insignificant activities. These are listed in Appendix B to the permit.

The permit is required to include periodic monitoring for all emissions units, including insignificant activities, per EPA guidance. The insignificant activities at this Facility are only subject to general applicable requirements. Using the criteria outlined earlier in this TSD, the following table documents the justification why no additional periodic monitoring is necessary for the current insignificant activities. See Attachment I to this TSD for PTE information for the insignificant activities.

**Table 6. Insignificant Activities**

Insignificant Activity	General Applicable Emission limit	Discussion
Fuel use: space heaters fueled by, kerosene, natural gas, or propane, but only if the combined total capacity of all space heaters at the stationary source is less than or equal to 420,000 Btu per hour. [insignificant natural gas-fired space heaters]	$PM \leq 0.60$ or $0.40$ MMBtu/hr, depending on year constructed $Opacity \leq 20\%$ with exceptions (Minn. R. 7011.0510/0515)	For the insignificant space heaters: based on the fuels used and EPA published emissions factors, it is highly unlikely that the insignificant space heaters could violate the applicable requirements.
Fugitive emissions from unpaved roads and parking lots [unpaved roads and parking lots]	All persons shall take reasonable precautions to prevent the discharge of visible fugitive dust emissions beyond the lot line of the property on which the emissions originate. (Minn. R. 7011.0150)	For the unpaved roadways: based on short length of the roadway, it is highly unlikely that fugitive dust from the roadway would violate the applicable requirements.
Equipment used for hydraulic or hydrostatic testing [hydraulic and	PM, variable depending on airflow $Opacity \leq 20\%$ with exceptions	While no known emissions estimation method exists for this equipment, based on general knowledge of how they operate, it is highly unlikely that this equipment could generate particulate

Insignificant Activity	General Applicable Emission limit	Discussion
hydrostatic testing equipment]	(Minn. R. 7011.0710/0715)	matter. In addition, this equipment would be operated and vented directly into a building, so testing is not feasible.
Brazing, soldering or welding equipment [welding equipment]	PM, variable depending on airflow Opacity $\leq$ 20% with exceptions (Minn. R. 7011.0710/0715)	For welding equipment, based on EPA published emissions factors, it is highly unlikely that the welding equipment could violate the applicable requirement. In addition, this unit is typically operated and vented inside a building, so testing for PM or opacity is not feasible.
Infrequent use of spray painting equipment for routine housekeeping or plant upkeep activities not associated with primary production processes [painting of piping, emission stacks, and other equipment]	PM, variable depending on airflow Opacity $\leq$ 20% with exceptions (Minn. R. 7011.0710/0715)	For spray painting equipment: it is highly unlikely that the spray painting equipment could violate the applicable requirement.
Individual emission units, each of which have potential emissions less than 5.7 lb/hr of CO, 2.28 lbs/hr other criteria pollutants; 10,000 tpy CO <sub>2</sub> e; or actual less than 2 tpy CO, 1tpy other criteria pollutants; 1000 tpy CO <sub>2</sub> e [insignificant portable generator]	SO <sub>2</sub> < 0.50 lb/MMBtu Opacity $\leq$ 20% (Minn. R. 7011.2300)	For the insignificant portable generator: based on the fuels used, the horsepower rating of the equipment, and EPA published emissions factors, it is unlikely that the insignificant portable generator could violate the applicable requirements.

### 3.5 Comments Received

Public Notice Period: September 2, 2011 – October 3, 2011

EPA 45-day Review Period: September 2, 2011-October 18, 2011

Comments were not received from the public during the public notice period or during EPA's 45-day review.

#### **4. Permit Fee Assessment**

*This permit action is the reissuance of an individual Part 70; therefore, no application fees apply under Minn. R. 7002.0016, subp. 1 to the changes that are covered by the reissuance application. However, the permit action rolled in additional points used to determine the permit fee for limits to remain below threshold as required by Minn. R. 7002.0019, so only the additional fees apply.*

#### **5. Conclusion**

Based on the information provided by Northern Natural Gas Company – Wrenshall LNG, the MPCA has reasonable assurance that the proposed operation of the emission facility, as described in the Air Emission Permit No. 01700011-005 and this TSD, will not cause or contribute to a violation of applicable federal regulations and Minnesota Rules.

Staff Members on Permit Team: Amrill Okonkwo (project manager/engineer)  
Amanda Baynham, Eastern Research Group (contractor)  
Stephen Treimel, Eastern Research Group (contractor)  
Robert Beresford (enforcement)  
Toni Volkmeier (peer reviewer)

AQ File No. 624F; DQ 3064

Attachments: 1. PTE Summary and Emissions Calculation Spreadsheets  
2. Facility Description and CD-01 Forms  
3. Points Calculator Spreadsheet  
4. Attachment III and Attachment IIII, EPA's Applicability Determinations



Attachment 1. PTE Summary and Emission Calculations  
(Xcel Spreadsheet, paper copy only)





Attachment 2. Facility Description and CD-01 Forms  
(Delta Printouts, paper copy only)



Attachment 3. Points Calculator Spreadsheet  
(Delta Printouts, paper copy only)



Attachment 4. Attachment III and Attachment IIII, EPA's Applicability Determinations  
(paper copy only)



NNG\_Wrenshall LNG  
005\_TSD Attachment



NNG\_Wrenshall LNG  
005\_TSD Attachment