

**MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY
AIR QUALITY DIVISION**

EFFECTIVE DATE: June 11, 2014

ISSUED TO

Wolverine Power - Vandyke Generating Plant

State Registration Number (SRN): B5421

LOCATED AT

3150 143rd Avenue, Dorr, Michigan 49323

SOURCE-WIDE PERMIT TO INSTALL

Permit Number: MI-PTI-B5421-2014

This Permit to Install (PTI) is issued in accordance with and subject to Section 5505(5) of Act 451. Pursuant to Michigan Air Pollution Control Rule 214a, the terms and conditions herein, identified by the underlying applicable requirement citation of Rule 201(1)(a), constitute a federally enforceable PTI. The PTI terms and conditions do not expire and remain in effect unless the criteria of Rule 201(6) are met. Operation of all emission units identified in the PTI is subject to all applicable future or amended rules and regulations pursuant to Act 451 and the federal Clean Air Act.

Michigan Department of Environmental Quality

Rex Lane, Kalamazoo District Supervisor

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A. GENERAL CONDITIONS

1. Any collected air contaminants shall be removed as necessary to maintain the equipment at the required operating efficiency. The collection and disposal of air contaminants shall be performed in a manner so as to minimize the introduction of contaminants to the outer air. Transport of collected air contaminants in Priority I and II areas requires the use of material handling methods specified in Rule 370(2). **(R 336.1370)**
2. The permittee shall comply with Rule 301, which states, in part, "Except as provided in subrules 2, 3, and 4 of this rule, a person shall not cause or permit to be discharged into the outer air from a process or process equipment a visible emission of a density greater than the most stringent of the following: **(R 336.1301(1))**
 - a. A 6-minute average of 20 percent opacity, except for one 6-minute average per hour of not more than 27 percent opacity.
 - b. A limit specified by an applicable federal new source performance standard.

The grading of visible emissions shall be determined in accordance with Rule 303.

3. The permittee shall not cause or permit the emission of an air contaminant or water vapor in quantities that cause, alone or in reaction with other air contaminants, either of the following:
 - a. Injurious effects to human health or safety, animal life, plant life of significant economic value, or property.¹ **(R 336.1901(a))**
 - b. Unreasonable interference with the comfortable enjoyment of life and property.¹ **(R 336.1901(b))**
4. The department may require the owner or operator of any source of an air contaminant to conduct acceptable performance tests, at the owner's or operator's expense, in accordance with Rule 1001 and Rule 1003, under any of the conditions listed in Rule 1001(1). **(R 336.2001)**
5. The permittee shall provide notice of an abnormal condition, start-up, shutdown, or malfunction that results in emissions of a hazardous or toxic air pollutant which continue for more than one hour in excess of any applicable standard or limitation, or emissions of any air contaminant continuing for more than two hours in excess of an applicable standard or limitation, as required in Rule 912, to the appropriate AQD District Office. The notice shall be provided not later than two business days after the start-up, shutdown, or discovery of the abnormal conditions or malfunction. Notice shall be by any reasonable means, including electronic, telephonic, or oral communication. Written reports, if required under Rule 912, must be submitted to the appropriate AQD District Supervisor within 10 days after the start-up or shutdown occurred, within 10 days after the abnormal conditions or malfunction has been corrected, or within 30 days of discovery of the abnormal conditions or malfunction, whichever is first. The written reports shall include all of the information required in Rule 912(5). **(R 336.1912)**
6. The process or process equipment included in this permit shall not be reconstructed, relocated, or modified unless a PTI authorizing such action is issued by the department, except to the extent such action is exempt from the PTI requirements by any applicable rule. ² **(R 336.1201(1))**
7. The department may, after notice and opportunity for a hearing, revoke PTI terms or conditions if evidence indicates the process or process equipment is not performing in accordance with the terms and conditions of the PTI or is violating the department's rules or the CAA. ² **(R 336.1201(8), Section 5510 of Act 451)**
8. The terms and conditions of a PTI shall apply to any person or legal entity that now or hereafter owns or operates the process or process equipment at the location authorized by the PTI. If a new owner or operator submits a written request to the department pursuant to Rule 219 and the department approves the request, this PTI will be amended to reflect the change of ownership or operational control. The request must include all of the information required by Subrules (1)(a), (b) and (c) of Rule 219. The written request shall be sent to the appropriate AQD District Supervisor, MDEQ. ² **(R 336.1219)**
9. If the installation, reconstruction, relocation, or modification of the equipment for which PTI terms and conditions have been approved has not commenced within 18 months of the original PTI issuance date, or has been interrupted for 18 months, the applicable terms and conditions from that PTI, as incorporated into the ROP, shall become void unless otherwise authorized by the department. Furthermore, the person to whom

that PTI was issued, or the designated authorized agent, shall notify the department via the Supervisor, Permit Section, MDEQ, AQD, P. O. Box 30260, Lansing, Michigan 48909, if it is decided not to pursue the installation, reconstruction, relocation, or modification of the equipment allowed by the terms and conditions from that PTI. ²
(R 336.1201(4))

Footnotes:

¹This condition is state-only enforceable and was established pursuant to Rule 201(1)(b).

²This condition is federally enforceable and was established pursuant to Rule 201(1)(a).

B. SOURCE-WIDE CONDITIONS

Part B outlines the Source-Wide Terms and Conditions that apply to this stationary source. The permittee is subject to these special conditions for the stationary source in addition to the general conditions in Part A.

The permittee shall comply with all specific details in the special conditions and the underlying applicable requirements cited. If a specific condition type does not apply to this source, NA (not applicable) has been used in the table. If there are no Source-Wide Conditions, this section will be left blank.

C. EMISSION UNIT CONDITIONS

Part C outlines terms and conditions that are specific to individual emission units listed in the Emission Unit Summary Table. The permittee is subject to the special conditions for each emission unit in addition to the General Conditions in Part A.

The permittee shall comply with all specific details in the special conditions and the underlying applicable requirements cited. If a specific condition type does not apply, NA (not applicable) has been used in the table. If there are no conditions specific to individual emission units, this section will be left blank.

EMISSION UNIT SUMMARY TABLE

The descriptions provided below are for informational purposes and do not constitute enforceable conditions.

Emission Unit ID	Emission Unit Description (Including Process Equipment & Control Device(s))	Installation Date/ Modification Date	Flexible Group ID
EUTURBINE02	Simple-cycle combustion turbine that fires natural gas and is used to generate electrical energy. The unit is rated at 24.8 MW and 316 MM Btu/hr. It was installed in 2001 and operates as a peaking unit.	06-15-01/NA	NA
EUSTARTER_ENGINE	A 386 HP diesel-fired engine generator that assists in the startup of EUTURBINE02.	06-15-01/NA	NA

EUTURBINE02 EMISSION UNIT CONDITIONS

DESCRIPTION

A simple-cycle combustion turbine that fires natural gas, and is used to generate electrical energy. The unit is rated at 24.8 MW and 316 MM Btu/hr. It was installed in 2001 and operates as a peaking unit.

Flexible Group ID: NA

POLLUTION CONTROL EQUIPMENT

NA

I. EMISSION LIMIT(S)

Pollutant	Limit	Time Period/ Operating Scenario	Equipment	Monitoring/ Testing Method	Underlying Applicable Requirements
1. Nitrogen oxides	132 ppmv at 15% O ₂ and on a dry gas basis ²	Test Protocol	EUTURBINE02	SC V.1.	40 CFR 60 Subpart GG
2. Nitrogen oxides	0.55 pound per million BTU's heat input based on the natural gas higher heating value ²	Test Protocol	EUTURBINE02	SC V.1.	R 336.1205(3)
3. Nitrogen oxides	193.1 pounds per hour ²	24-hour average	EUTURBINE02	SC V.1.	R 336.1205(3)
4. Nitrogen oxides	35 tons/year ²	Based on a 12-month rolling time period as determined at the end of each calendar month	EUTURBINE02	SC VI.1.	R 336.1205(3)

II. MATERIAL LIMIT(S)

NA

III. PROCESS/OPERATIONAL RESTRICTION(S)

1. EUTURBINE02 shall be fired exclusively with natural gas.² (R 336.205(1)(a), R 336.1401)

IV. DESIGN/EQUIPMENT PARAMETER(S)

NA

V. TESTING/SAMPLING

1. Within 60 days after achieving the maximum production rate, but not later than 180 days after the commencement of trial operation, federal Standards of Performance for New Stationary Sources require verification of the NO_x emission rate from EUTURBINE02 by testing, at owner's expense, in accordance with 40 CFR, Part 60 Subpart A and GG. Verification of emission rates includes the submittal of a complete report of the test results. The permittee shall notify the District Supervisor in writing within 15 days of the date of commencement of trial operation of each turbine in accordance with 40 CFR, Part 60.7(a)(3). Stack testing

procedures and the location of stack testing ports shall be in accordance with the applicable federal Reference Methods, 40 CFR 60, Appendix A. Not less than 60 days prior to testing, a complete stack-testing plan must be submitted to the AQD. The final plan must be approved by the AQD prior to testing. **(R 336.2001, R 336.2003, R 336.2004, 40 CFR 60, Subparts A and GG)**

VI. MONITORING/RECORDKEEPING

Records shall be maintained on file for a period of five years.² **(R 336.1201(3))**

1. The permittee shall monitor and record the amount of natural gas combusted in EUTURBINE02 during each calendar month. Based on the higher heating value of the natural gas, the permittee shall determine actual monthly heat input to the turbine.

The monthly NOx emission rate (tons/month) from the EUTURBINE02 shall be determined by multiplying the monthly actual heat input to the turbine with the applicable emission limit, in pound per million Btu heat input, or the emission rate in pound per million Btu heat input derived from the last compliance test. The resulting emission rate shall then be divided by 2,000 pounds per ton.

The monthly NOx emission rate from the turbine, as determined above, shall be added to the total EUTURBINE02 NOx emissions from the previous 11 months to determine the 12-month rolling time period emission rate, in tons per year.

These records shall be kept on file and made available to the Air Quality Division upon request.² **(R 336.1205(1)(a))**

VII. REPORTING

NA

VIII. STACK/VENT RESTRICTION(S)

The exhaust gases from the stacks listed in the table below shall be discharged unobstructed vertically upwards to the ambient air unless otherwise noted:

Stack & Vent ID	Maximum Exhaust Dimensions (inches)	Minimum Height Above Ground (feet)	Underlying Applicable Requirements
1. SVTURBINE02	154 ²	45 ²	40 CFR 52.21 (c) and (d)

IX. OTHER REQUIREMENT(S)

1. The permittee shall comply with all of the applicable requirements for monitoring, recording and reporting as contained in 40 CFR 60, Subparts A and GG, including the Fuel Monitoring Program contained in Appendix 2.² **(40 CFR 60, Subparts A and GG, R 336.1201(3))**

See Appendix 2

Footnotes:

¹ This condition is state only enforceable and was established pursuant to Rule 201(1)(b).

² This condition is federally enforceable and was established pursuant to Rule 201(1)(a).

EUSTARTER_ENGINE EMISSION UNIT CONDITIONS
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DESCRIPTION

A 386 HP diesel-fired engine generator that assists in the startup of EUTURBINE02.

Flexible Group ID: NA

POLLUTION CONTROL EQUIPMENT

NA

I. EMISSION LIMIT(S)

Pollutant	Limit	Time Period/ Operating Scenario	Equipment	Monitoring/ Testing Method	Underlying Applicable Requirements
NA	NA	NA	NA	NA	NA

II. MATERIAL LIMIT(S)

Material	Limit	Time Period/ Operating Scenario	Equipment	Monitoring/ Testing Method	Underlying Applicable Requirements
NA	NA	NA	NA	NA	NA

III. PROCESS/OPERATIONAL RESTRICTION(S)

1. EUSTARTER_ENGINE shall be fired with diesel fuel having a sulfur content less than or equal to 0.05% by weight.² (R 336.1401)

IV. DESIGN/EQUIPMENT PARAMETER(S)

NA

V. TESTING/SAMPLING

NA

VI. MONITORING/RECORDKEEPING

NA

VII. REPORTING

NA

VIII. STACK/VENT RESTRICTION(S)

The exhaust gases from the stacks listed in the table below shall be discharged unobstructed vertically upwards to the ambient air unless otherwise noted:

Stack & Vent ID	Maximum Exhaust Dimensions (inches)	Minimum Height Above Ground (feet)	Underlying Applicable Requirements
NA	NA	NA	NA

IX. OTHER REQUIREMENT(S)

NA

Footnotes:

¹ This condition is state only enforceable and was established pursuant to Rule 201(1)(b).
² This condition is federally enforceable and was established pursuant to Rule 201(1)(a).

D. FLEXIBLE GROUP CONDITIONS

Part D outlines the terms and conditions that apply to more than one emission unit. The permittee is subject to the special conditions for each flexible group in addition to the General Conditions in Part A.

The permittee shall comply with all specific details in the special conditions and the underlying applicable requirements cited. If a specific condition type does not apply, NA (not applicable) has been used in the table. If there are no special conditions that apply to more than one emission unit, this section will be left blank.

APPENDICES

Appendix 1. Abbreviations and Acronyms

The following is an alphabetical listing of abbreviations/acronyms that may be used in this permit.

AQD	Air Quality Division	MM	Million
acfm	Actual cubic feet per minute	MSDS	Material Safety Data Sheet
BACT	Best Available Control Technology	MW	Megawatts
BTU	British Thermal Unit	NA	Not Applicable
°C	Degrees Celsius	NAAQS	National Ambient Air Quality Standards
CAA	Federal Clean Air Act	NESHAP	National Emission Standard for Hazardous Air Pollutants
CAM	Compliance Assurance Monitoring	NMOC	Non-methane Organic Compounds
CEM	Continuous Emission Monitoring	NOx	Oxides of Nitrogen
CFR	Code of Federal Regulations	NSPS	New Source Performance Standards
CO	Carbon Monoxide	NSR	New Source Review
COM	Continuous Opacity Monitoring	PM	Particulate Matter
department	Michigan Department of Environmental Quality	PM-10	Particulate Matter less than 10 microns in diameter
dscf	Dry standard cubic foot	pph	Pound per hour
dscm	Dry standard cubic meter	ppm	Parts per million
EPA	United States Environmental Protection Agency	ppmv	Parts per million by volume
EU	Emission Unit	ppmw	Parts per million by weight
°F	Degrees Fahrenheit	PS	Performance Specification
FG	Flexible Group	PSD	Prevention of Significant Deterioration
GACS	Gallon of Applied Coating Solids	psia	Pounds per square inch absolute
GC	General Condition	psig	Pounds per square inch gauge
gr	Grains	PeTE	Permanent Total Enclosure
HAP	Hazardous Air Pollutant	PTI	Permit to Install
Hg	Mercury	RACT	Reasonable Available Control Technology
hr	Hour	ROP	Renewable Operating Permit
HP	Horsepower	SC	Special Condition
H ₂ S	Hydrogen Sulfide	scf	Standard cubic feet
HVLP	High Volume Low Pressure *	sec	Seconds
ID	Identification (Number)	SCR	Selective Catalytic Reduction
IRSL	Initial Risk Screening Level	SO ₂	Sulfur Dioxide
ITSL	Initial Threshold Screening Level	SRN	State Registration Number
LAER	Lowest Achievable Emission Rate	TAC	Toxic Air Contaminant
lb	Pound	Temp	Temperature
m	Meter	THC	Total Hydrocarbons
MACT	Maximum Achievable Control Technology	tpy	Tons per year
MAERS	Michigan Air Emissions Reporting System	µg	Microgram
MAP	Malfuction Abatement Plan	VE	Visible Emissions
MDEQ	Michigan Department of Environmental Quality	VOC	Volatile Organic Compounds
mg	Milligram	yr	Year
mm	Millimeter		

*For HVLP applicators, the pressure measured at the gun air cap shall not exceed 10 pounds per square inch gauge (psig).

Appendix 2. Monitoring Requirements

The following monitoring procedures, methods, or specifications are the details to the monitoring requirements identified and referenced in EUTURBINE02.

Fuel Monitoring Program for Sources Subject to 40 CFR Part 60 Subpart GG

1. Nitrogen
 - a. Monitoring of fuel nitrogen content shall not be required while pipeline quality natural gas, as defined in 40 CFR 72.2, is the only fuel fired in the gas turbine.
2. Sulfur
 - a. Analysis for fuel sulfur content of the natural gas shall be conducted using one of approved ASTM reference methods for the measurement of sulfur in gaseous fuels, or approved alternate method. Reference methods are (as referenced in 40 CFR 60.334(b)(2)):
 - i. ASTM D1072-80: Total Sulfur in Natural Gas by Hydrogenation
 - ii. ASTM D3031-81: Sulfur in Petroleum Gas by Oxidative Microcoulometry
 - iii. ASTM D4084-82: Analysis of Hydrogen Sulfide in Gaseous Fuels (Lead Acetate Reaction Rate Method)
 - iv. Testing for Hydrogen Sulfide in Natural Gas Using Length of Stain Tubes
 - b. Effective the date this schedule is approved, sulfur monitoring shall be conducted as follows:
 - i. Twice monthly for six months
 - A. if this monitoring shows little variability and represents compliance with the sulfur dioxide emission limits, then:
 - ii. Once per calendar quarter for six calendar quarters
 - B. if this monitoring show little variability and represents compliance with the sulfur dioxide emission limits, then:
 - iii. Semiannually, during the first and third calendar quarters of the calendar year.
 - iv. Should any sulfur analysis indicate non-compliance with 40 CFR 60.333, sulfur monitoring shall be conducted weekly during the interim period when this custom monitoring schedule is being re-examined.
 - c. If there is a change in the fuel supply, the owner/operator must notify the Administrator of such changes for re-examination of this custom schedule. A substantial change in fuel quality shall be considered as a change in fuel supply. Sulfur monitoring shall be conducted weekly during the interim period when this custom monitoring schedule is being re-examined.
3. Fuel analysis can be conducted at a single separate site for multiple plants (engines) provided there are no additional entry points for natural gas or other sulfur containing streams between the proposed sampling site and the plants (engines) in question.
4. Records of sample analysis and fuel supply pertinent to this custom schedule shall be retained for a period of five years and be available for inspection.