

State Registration Number
B6145

**RENEWABLE OPERATING PERMIT
STAFF REPORT**

ROP Number
MI-ROP-B6145-20XX

DTE Electric Company - Greenwood Energy Center

State Registration Number (SRN): B6145

Located at

7000 Kilgore Road, Avoca, St. Clair County, Michigan 48006-2525

Permit Number: MI-ROP-B6145-20XX

Staff Report Date: March 25, 2024

This Staff Report is published in accordance with Sections 5506 and 5511 of Part 55, Air Pollution Control, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended (Act 451). Specifically, Rule 214(1) of the administrative rules promulgated under Act 451, requires that the Michigan Department of Environment, Great Lakes, and Energy (EGLE), Air Quality Division (AQD), prepare a report that sets forth the factual basis for the terms and conditions of the Renewable Operating Permit (ROP).

TABLE OF CONTENTS

MARCH 25, 2024 - STAFF REPORT

3

State Registration Number

B6145

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Purpose

Major stationary sources of air pollutants, and some non-major sources, are required to obtain and operate in compliance with an ROP pursuant to Title V of the federal Clean Air Act; and Michigan’s Administrative Rules for Air Pollution Control promulgated under Section 5506(1) of Act 451. Sources subject to the ROP program are defined by criteria in Rule 211(1). The ROP is intended to simplify and clarify a stationary source’s applicable requirements and compliance with them by consolidating all state and federal air quality requirements into one document.

This Staff Report, as required by Rule 214(1), sets forth the applicable requirements and factual basis for the draft ROP terms and conditions including citations of the underlying applicable requirements, an explanation of any equivalent requirements included in the draft ROP pursuant to Rule 212(5), and any determination made pursuant to Rule 213(6)(a)(ii) regarding requirements that are not applicable to the stationary source.

General Information

Stationary Source Mailing Address:	DTE Electric Company – Greenwood Energy Center 7000 Kilgore Road Avoca, Michigan 48006-2525
Source Registration Number (SRN):	B6145
North American Industry Classification System (NAICS) Code:	221112
Number of Stationary Source Sections:	2
Is Application for a Renewal or Initial Issuance?	Renewal
Application Number:	202200160
Responsible Official – Section 1:	Nicholas Kammer, Plant Manager - Energy Supply 810-324-3228
Responsible Official - Section 2:	Biljana Pecov, Plant Manager - Energy Supply - Peakers 313-235-8929
AQD Contact – District Inspector:	Owen Pierce, Environmental Engineer 586-854-3244
AQD Contact – ROP Writer:	Shamim Ahammod, Senior Environmental Engineer 586-212-0508
Date Application Received:	August 23, 2022
Date Application Was Administratively Complete:	August 23, 2022
Is Application Shield in Effect?	Yes
Date Public Comment Begins:	March 25, 2024
Deadline for Public Comment:	April 24, 2024

Source Description

DTE Electric Company – Greenwood Energy Center is an electric generating facility that is permitted to operate one main 785 megawatts (MW) boiler, two auxiliary boilers, three combustion turbine generator peaking units, a fire pump, and a gasoline dispensing tank. This facility is engaged in the generation of electricity for sale and operates in a cyclic mode to meet peak system load demands.

The source is a major source of emissions for nitrogen oxides (NO_x), sulfur dioxide (SO₂), volatile organic compounds (VOCs), and Hazardous Air Pollutants (HAPs). Section 1 of the facility's ROP includes the main boiler, the two auxiliary boilers, and a fire pump engine. Section 2 includes the three natural gas-fired combustion turbine generator peaking units.

DTE Electric Company Greenwood Energy Center, located at 7000 Kilgore Road, has the following emission units:

EUBOILER1: one 785-Megawatt gross output boiler-electric generator. The main boiler can be fired on any combination of natural gas, residual oil, distillate oil, and recycled used oil. During the high demand for electricity, the main boiler is used to produce electricity. The main boiler uses fuel oil to start up and then uses natural gas as fuel. The main boiler produces steam and then steam is sent to the steam turbine to produce electricity. Continuous emissions monitors (CEMS) are installed to measure emissions of NO_x, SO₂, and opacity from the main boiler.

EUEASTAUXBOILER: one auxiliary boiler rated at 181.4 MMBTU per hour heat input, which is fired with pipeline natural gas. This unit is used for process heat.

EUGDF: a gasoline underground storage tank of 2,500-gallon capacity (9.46 cubic meters) for gasoline dispensing at the facility.

EUCTG11-1, EUCTG11-2, and EUCTG12-1: three combustion turbine generator peaking units. Each unit is rated at 82.4 megawatts (MW). These units are natural gas-fired, simple-cycle turbines each with a dry low-NO_x combustor. During the high demand for electricity, these three-combustion turbine generator peaking units are used to produce electricity. Predictive emissions monitoring systems (PEMS) are installed to measure NO_x emissions from combustion turbines.

EUEMGFIREPUMP: Emergency fire pump powered by a diesel fuel-fired internal combustion engine with a maximum heat input of 1.98 MMBTU/hr.

Changes made with this renewal include the removal of EUWESTAUXBOILER. This was an auxiliary boiler rated at 173 MMBTU per hour heat input fired with No. 2 fuel oil, No. 6 fuel oil or blends thereof. The removal of this boiler results in a reduction of air pollutants and hazardous air pollutant (HAP) emissions.

The following table lists stationary source emission information as reported to the Michigan Air Emissions Reporting System (MAERS) for the year **2022**.

TOTAL STATIONARY SOURCE EMISSIONS

Pollutant	Tons per Year
Carbon Monoxide (CO)	175.076
Lead (Pb)	0.000875
Nitrogen Oxides (NO _x)	255.858
PM10*	15.977
Sulfur Dioxide (SO ₂)	2.215
Volatile Organic Compounds (VOCs)	11.620

* Particulate matter (PM) that has an aerodynamic diameter less than or equal to a nominal 10 micrometers.

The following table lists potential Hazardous Air Pollutant emissions as calculated by the source:

Individual Hazardous Air Pollutants (HAPs) **	Tons per Year
Individual HAPs from Boilers	
Arsenic	0.41
Benzene	0.08
Beryllium	0.10
Cadmium	0.13
Chromium	0.27
Cobalt	1.88
Ethyl Benzene	0.02
Formaldehyde	10.34
Hexane	57.08
lead	0.47
manganese	0.94
Mercury	0.10
Napthalene	0.35
Nickel	26.39
Selenium	0.53
Toluene	1.94
Xylene	0.03
Total HAPs from Boilers	101
Individual HAPs from Combustion Turbines	
Acetaldehyde	0.557
Acrolein	0.089
Benzene	0.167
1,3-Butadiene	0.006
Ethyl benzene	0.446
Formaldehyde	9.885
Naphthalene	0.018
PAH	0.031
Propylene oxide	0.404
Toluene	1.810
Xylenes	0.891
Total HAPS from Combustion Turbines	13.41
Total Hazardous Air Pollutants (HAPs)	114.47

**As listed pursuant to Section 112(b) of the federal Clean Air Act.

See Parts C and D in the ROP for summary tables of all processes at the stationary source that are subject to process-specific emission limits or standards.

Regulatory Analysis

The following is a general description and history of the source. Any determinations of regulatory non-applicability for this source are explained below in the Non-Applicable Requirement part of the Staff Report and identified in Part E of the ROP.

The stationary source is in the northern part of St. Clair County, which is currently designated by the United States Environmental Protection Agency (USEPA) as attainment/unclassified for all criteria pollutants.

A portion of St. Clair County is currently designated by the United States Environmental Protection Agency (USEPA) as a non-attainment area with respect to the SO₂ standard. The stationary source is located outside the portion of St. Clair County that is designated as non-attainment with respect to the SO₂ standard.

The stationary source is subject to Title 40 of the Code of Federal Regulations (CFR) Part 70 because the potential to emit of nitrogen oxides, carbon monoxide and PM10 exceeds 100 tons per year.

The potential to emit of any single HAP regulated by Section 112 of the federal Clean Air Act is equal to or more than 10 tons per year and/or the potential to emit of all HAPs combined is equal to or more than 25 tons per year.

EUBOILER1 and EUEASTAUXBOILER at the stationary source were not subject to the Prevention of Significant Deterioration (PSD) regulations of the Michigan Air Pollution Control Rules Part 18, Prevention of Significant Deterioration of Air Quality and 40 CFR 52.21 because the process equipment was constructed/installed prior to June 19, 1978, the promulgation date of the PSD regulations.

The three (3) natural gas-fired combustion turbine generators, EUCTG11-1, EUCTG11-2 and EUCTG12-1 at the stationary source were subject to review under the Prevention of Significant Deterioration (PSD) regulations of 40 CFR 52.21 because at the time of New Source Review permitting, the potential to emit of nitrogen oxides, carbon monoxide and PM10 were each greater than 250 tons per year and the installation of EUCTG11-1, EUCTG11-2 and EUCTG12-1 resulted in a significant increase in nitrogen oxides, carbon monoxide and PM10.

The gasoline storage tank, EUGDF is subject to R 336.1703 for dispensing facilities since the gasoline storage tank is new (placed into operation on or after July 1, 1979) and is a stationary vessel of more than 2,000-gallon capacity (one tank with a 2,500-gallon capacity).

The main boiler, EUBOILER1 at the stationary source is subject to the Standards of Performance for Fossil-Fuel-Fired Steam Generators promulgated in 40 CFR Part 60, Subparts A and D.

The three (3) natural gas-fired combustion turbine generators, EUCTG11-1, EUCTG11-2 and EUCTG12-1 are subject to the New Source Performance Standards for Stationary Gas Turbines specified in 40 CFR 60, Subparts A and GG.

The fire pump engine, EUEMGFIREPUMP at the stationary source is subject to 40 CFR Part 60, Subpart IIII, Standards of Performance for Stationary Compression Ignition Internal Combustion Engines. EUEMGFIREPUMP is a non-road diesel fueled compression ignition, 4-cycle, and in-line 6-cylinder engine with 8.9 liter total cylinder displacement with a rated operating speed less than or equal to 2300 RPM. This engine was manufactured on April 14, 2016 and in accordance with 40 CFR 60.4200, construction commenced on April 18, 2016.

The three (3) natural gas-fired combustion turbine generators, EUCTG11-1, EUCTG11-2 and EUCTG12-1 at the stationary source are subject to the National Emission Standard for Hazardous Air Pollutants for Stationary Combustion Turbines promulgated in 40 CFR Part 63, Subparts A and YYYY. These are existing turbines as defined in 40 CFR 63.6090(a)(1) and there are no requirements under this subpart for existing turbines.

The auxiliary boiler, EUEASTAUXBOILER at the stationary source is subject to the National Emission Standard for Hazardous Air Pollutants for Major Sources: Industrial, Commercial, and Institutional Boilers and Process Heaters promulgated in 40 CFR Part 63, Subparts A and DDDDD. This is an existing boiler as defined in 40 CFR 63.7575 of Subpart DDDDD that is equipped with a continuous oxygen trim system.

The fire pump engine, EUEMGFIREPUMP at the stationary source is subject to the National Emission Standard for Hazardous Air Pollutants for Stationary Reciprocating Internal Combustion Engines promulgated in 40 CFR Part 63, Subparts A and ZZZZ. Compliance with 40 CFR Part 63, Subpart ZZZZ is demonstrated through compliance with 40 CFR Part 60, Subpart IIII.

The main boiler, EUBOILER1, at the stationary source is not subject to the National Emission Standard for Hazardous Air Pollutants for Major Sources: Industrial, Commercial, and Institutional Boilers and Process Heaters and the National Emission Standard for Hazardous Air Pollutants: Coal- and Oil-Fired Electric Utility Steam Generating Units promulgated in 40 CFR Part 63, Subparts A, DDDDD, and UUUUU. It has been demonstrated that EUBOILER1 meets the definition of a natural gas-fired electric generating unit (EGU) as defined under 40 CFR 63.10042 of Subpart UUUUU and the exemption listed under 40 CFR 63.7491(a) of Subpart DDDDD.

EUBOILER1, EUCTG11-1, EUCTG11-2, and EUCTG12-1 at the stationary source are subject to the federal Acid Rain program promulgated in 40 CFR Part 72.

EUBOILER1, EUCTG11-1, EUCTG11-2, and EUCTG12-1 at the stationary source are subject to the Cross-State Air Pollution Rule NOx Annual Trading Program pursuant to 40 CFR Part 97, Subpart AAAAA.

EUBOILER1, EUCTG11-1, EUCTG11-2, and EUCTG12-1 at the stationary source are subject to the Cross-State Air Pollution Rule NOx Ozone Season Group 3 Trading program, as specified in 40 CFR Part 97, Subpart GGGGG.

EUBOILER1, EUCTG11-1, EUCTG11-2 and EUCTG12-1 at the stationary source are subject to the Cross-State Air Pollution Rule SO₂ Group 1 Trading Program pursuant to 40 CFR Part 97, Subpart CCCCC.

The monitoring conditions contained in the ROP are necessary to demonstrate compliance with all applicable requirements and are consistent with the "Procedure for Evaluating Periodic Monitoring Submittals."

No emission units have emission limitations or standards that are subject to the federal Compliance Assurance Monitoring rule pursuant to 40 CFR Part 64, because the emission units at the stationary source either do not have a control device or those with a control device do not have potential pre-control emissions over the major source thresholds.

The NOx emissions from EUBOILER1 are controlled by flue gas injection. This pollutant specific emission unit is not subject to CAM per 40 CFR 64.2(b)(vi) because the permittee uses CEMS to monitor NOx emissions.

Please refer to Parts B, C, and D in the draft ROP for detailed regulatory citations for the stationary source. Part A contains regulatory citations for general conditions.

Source-Wide Permit to Install (PTI)

Rule 214a requires the issuance of a Source-Wide PTI within the ROP for conditions established pursuant to Rule 201. All terms and conditions that were initially established in a PTI are identified with a footnote designation in the integrated ROP/PTI document.

The following table lists all individual PTIs that were incorporated into previous ROPs. PTIs issued after the effective date of ROP No. MI-ROP-B6145-2018 are identified in Appendix 6 of the ROP.

PTI Number			
65-08	320-98A	180-72C	129-13

Streamlined/Subsumed Requirements

This ROP does not include any streamlined/subsumed requirements pursuant to Rules 213(2) and 213(6).

Non-applicable Requirements

Part E of the ROP lists requirements that are not applicable to this source as determined by the AQD, if any were proposed in the ROP Application. These determinations are incorporated into the permit shield provision set forth in Part A (General Conditions 26 through 29) of the ROP pursuant to Rule 213(6)(a)(ii).

Processes Not in the Draft ROP

There were no PTI exempt processes listed in the ROP Application pursuant to Rule 212(4) that were not included in the Draft ROP.

Draft ROP Terms/Conditions Not Agreed to by Applicant

This draft ROP does not contain any terms and/or conditions that the AQD and the applicant did not agree upon pursuant to Rule 214(2).

Compliance Status

The AQD finds that the stationary source is expected to be in compliance with all applicable requirements as of the effective date of this ROP.

Action taken by EGLE, AQD

The AQD proposes to approve this ROP. A final decision on the ROP will not be made until the public and affected states have had an opportunity to comment on the AQD's proposed action and draft permit. In addition, the USEPA is allowed up to 45 days to review the draft ROP and related material. The AQD is not required to accept recommendations that are not based on applicable requirements. The delegated decision maker for the AQD is Julie Brunner, ROP Central Unit Supervisor. The final determination for ROP approval/disapproval will be based on the contents of the ROP Application, a judgment that the stationary source will be able to comply with applicable emission limits and other terms and conditions, and resolution of any objections by the USEPA.