

STATEMENT OF BASIS for RED OAK POWER

TITLE V OPERATING PERMIT RENEWAL

Program Interest (PI): 18195 / Permit Activity Number: BOP190001

I. FACILITY INFORMATION

Red Oak Power is located at 832 Red Oak Lane, Sayreville Boro, Middlesex County, Sayreville, NJ 08872. The facility is an electricity generating station, owned and operated by Red Oak Power, LLC.

The facility is classified as a major facility based on its potential to emit 705 tons per year of Carbon Monoxide (CO), 292 tons per year of Nitrogen Oxides (NO_x), 103 tons per year of Volatile Organic Compounds (VOC), 104 tons per year of Sulfur Dioxide (SO₂), 345 tons per year of Total Suspended Particulates (TSP), 345 tons per year of Particulate Matter less than 10 microns (PM₁₀), 345 tons per year of Particulate Matter less than 2.5 microns (PM_{2.5}), 347 tons per year of Ammonia, and 3,861,124 tons per year of Greenhouse Gases as carbon dioxide equivalent (CO_{2e}) to the atmosphere.

This permit allows any individual HAP to be emitted at a rate to not exceed: 270 pounds per year of acetaldehyde; 44 pounds per year of acrolein; 0.028 pounds per year of arsenic; 81 pounds per year of benzene; 0.154 pounds per year of cadmium; 216 pounds per year of ethylbenzene; 4801 pounds per year of formaldehyde; 8.78 pounds per year of naphthalene; 14.9 pounds per year of polycyclic organic matter, and 196 pounds per year of propylene oxide.

II. AREA ATTAINMENT CLASSIFICATION

The Federal Clean Air Act (CAA) sets National Ambient Air Quality Standards (NAAQS) for six common air pollutants. These commonly found air pollutants (also known as "criteria pollutants") are particulate matter, ground-level ozone, carbon monoxide (CO), sulfur dioxide (SO₂), nitrogen dioxide (NO₂), and lead. The US Environmental Protection Agency (USEPA) also classifies areas as "attainment" or "nonattainment" for each criteria pollutant, based on the magnitude of an area's problem. Nonattainment classifications are used to specify what air pollution reduction measures an area must adopt, and when the area must reach attainment. Currently, the entire State of New Jersey is designated as nonattainment for the 8-hour ozone NAAQS. New Jersey is designated attainment for all other pollutants. For nonattainment classification refer to <https://www.epa.gov/green-book/green-book-national-area-and-county-level-multi-pollutant-information>.

III. BACKGROUND AND HISTORY

The equipment that emits air contaminants from this facility include: Three (3) Siemens Westinghouse Power Corporation 501F combined cycle combustion turbines each with a 183 Megawatt (MW) output and operating in conjunction with a heat recovery steam generator. Each turbine is equipped with Dry Low NO_x combustors and has Selective Catalytic Reduction System for NO_x control and Oxidation Catalyst for CO control. Other equipment at this facility includes a 16 (Million British Thermal Units per hour) MMBTU/hr non-utility boiler, a 20,000-gallon Ammonia storage tank and a ten cell cooling tower.

Table 1 - Operating Permit Revision History (located at the end of this document) provides a summary of all the changes that have been incorporated into the operating permit through seven-day notice changes, administrative amendments, minor modifications, or significant modifications since the approval of the initial operating permit or the most recent renewal thereof. Please refer to the attached explanation sheet for the structure and configuration of conditions of approval, included in the Facility Specific Requirements section of this permit.

A Facility-Wide Risk Assessment was conducted as part of the review of this permit application and health risk was determined to be negligible consistent with NJDEP Technical Manual 1003.

This is a Permit Renewal and includes the following changes:

1. Transfer of requirements for oxidation catalysts from OS Summary for U1 combustion turbines to their individual control devices, CD2, CD4, and CD6.
2. Transfer of requirements for Selective Catalytic Reduction Systems (SCRs) for U1 combustion turbines from U1 OS Summary to their individual control devices, CD1, CD3, and CD5.
3. Inclusion of HAPs at emission units U1 & U7 that are above the new lower revised reporting thresholds in N.J.A.C. 7:27-17. These HAPs are Acetaldehyde, Arsenic, Benzene, Cadmium, Ethylbenzene, Naphthalene and Propylene Oxide.

STATEMENT OF BASIS for RED OAK POWER

TITLE V OPERATING PERMIT RENEWAL

Program Interest (PI): 18195 / Permit Activity Number: BOP190001

4. Inclusion of methane and nitrous oxide emissions to U1 and U7 as they are above the 0.05 pound per hour N.J.A.C 7:27 – 8 reporting thresholds.
5. Clarification that Formaldehyde emissions are included in the VOC emission limits (U1 & U7).
6. Update of the FC section of the compliance plan.
7. Update of Section B, General Provisions and Authority of the Permit Text.
8. Addition of Federal Requirements Summary to U1.
9. Update of the CEMs Summary Requirements to add language which states that Emission Measurement Section (EMS) approval is required for a change in units being modified.
10. Update of N.J.A.C. 7:27-19 monitoring requirements to clarify that in addition to using CEMs, combustion adjustment can be performed by periodic emission monitoring OR if not using a certified CEMS, monitoring shall be performed in accordance with the specific procedures for combustion adjustment monitoring specified in NJDEP Technical Manual 1005.
11. Addition of the following sentence to the monitoring requirements of H₂SO₄ tons per year at U1, OS Summary
“In calculating the turbine emissions, the permittee may substitute the actual measured fuel heat content for the default value of 1020 Btu/scf”.
12. Revision of the following sentence for the monitoring requirements of SO₂, TSP, H₂SO₄, PM₁₀ tons per year at U1, OS summary from:
“In calculating the turbine emissions, the permittee may substitute the actual measured fuel heat content for the default value”
to:
“In calculating the turbine emissions, the permittee may substitute the actual measured fuel heat content for the default value of 1020 Btu/scf”.
13. The stack testing requirement for VOC emissions from the turbine was removed as per the Department’s “Testing and Monitoring Requirements for Existing Stationary Turbines” for natural gas. The facility has complied with this requirement.
14. Renewal of Acid Rain Permit.

There are no proposed increases to air contaminants from the facility. The HAPs (total) increases from 2.44 tons per year to 2.82 tons per year because of inclusion of the new HAPs that are above the new lower revised reporting thresholds in N.J.A.C. 7:27-17.

IV. BASIS FOR MONITORING AND RECORDKEEPING REQUIREMENTS

The facility’s operating permit includes monitoring, recordkeeping and reporting requirements that are sufficient to demonstrate the facility’s continued compliance with the applicable requirements consistent with the following:

1. Provisions to implement the testing and monitoring requirements of N.J.A.C. 7:27-22.18, the recordkeeping and reporting requirements of N.J.A.C. 7:27-22.19, and all emissions monitoring and analysis procedures or compliance assurance methods required under the applicable requirements, including any procedures and methods promulgated pursuant to 40 CFR 64; and
2. Where the applicable requirement does not require direct periodic monitoring of emissions, the Department requires periodic monitoring of surrogate parameters sufficient to yield reliable data from the relevant time period that are representative of the facility's compliance with the permit.
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Combustion Turbines:

For combustion turbines at U1 the facility monitors heat input and fuel use as surrogates for the short term and long-term (TPY) emission limits for HAPs.

The facility monitors heat input and fuel use as surrogate for short-term (lb/hr) emission limits for SO₂, TSP, PM₁₀, PM_{2.5} when combusting natural gas.

STATEMENT OF BASIS for RED OAK POWER

TITLE V OPERATING PERMIT RENEWAL

Program Interest (PI): 18195 / Permit Activity Number: BOP190001

The facility monitors fuel use and hours of operation, as surrogates for long-term (TPY) emission limits for VOC, NO_x, CO, SO₂, TSP, PM₁₀, PM_{2.5}, and Greenhouse gases as CO_{2e}.

Fuel Gas Heater

For fuel gas heaters (non-utility boiler) at U7 the facility monitors natural gas usage as the surrogate for the long term (TPY), and heat input as surrogate for short-term (lb/hr) emission limits for VOC, NO_x, CO, SO₂, TSP, PM₁₀, PM_{2.5} and HAPs.

Cooling Tower

For Cooling Tower the facility monitors the total solids concentration in the cooling tower circulating water as the surrogate for the long term (TPY) and short-term (lb/hr) emission limits for TSP, PM₁₀, and PM_{2.5}.

3. In some cases, direct periodic monitoring of emissions and/or surrogate parameters is not required due to one or more of the following:
- Equipment size and capacity limitations,
 - Subject equipment being permitted at the maximum rated capacity,
 - There is no specific state or Federal standard that applies to this piece of equipment,
 - Not a pollutant of concern for this piece of equipment,
 - Agreements with EPA on the frequency of testing and monitoring for combustion sources.

V. APPLICABLE STATE AND FEDERAL RULES

The facility is subject to New Jersey Air Pollution Control Regulations, codified in N.J.A.C. 7:27-1 through 34, as applicable. A complete text of these regulations is available at:

<http://www.nj.gov/dep/aqm/rules27.html>

The facility is also subject to Federal regulations listed below.

NSPS Subpart A:	New Source Performance Standards - General Provisions
NSPS Subpart GG:	Standards of Performance of Stationary Gas Turbines
40 CFR 72:	Acid Rain Program
40 CFR 97:	Cross State Air Pollution Rule
40CFR52.21:	Prevention of Significant Deterioration of Air Quality (PSD)

The Greenhouse Gas (GHG) emissions from this facility are 3,861,124 TPY CO_{2e} and there is no GHG emissions increase. This renewal is not subject to PSD rules at 40 CFR 52.21.

VI. FACILITY'S COMPLIANCE STATUS

The Responsible Official at the facility has certified that the facility currently meets all applicable requirements of the Federal Clean Air Act and the New Jersey Air Pollution Control Act. Based on this certification, the Department's evaluation of the information included in the facility's application, and a review of the facility's compliance status, the Department has concluded that this air pollution control operating permit should be approved.

The facility has submitted a timely and complete application to renew their operating permit and an application shield is in effect.

This operating permit also includes a permit shield, pursuant to the provisions of N.J.A.C. 7:27-22.17. A permit shield provides that compliance with the relevant conditions of the operating permit shall be deemed compliance with the specific applicable requirements that are in effect on the date of issuance of the draft operating permit, and which form the basis for the conditions in the operating permit.

STATEMENT OF BASIS for RED OAK POWER

TITLE V OPERATING PERMIT RENEWAL

Program Interest (PI): 18195 / Permit Activity Number: BOP190001

Also, prior to the expiration of the five-year period, the facility will be required to apply for a renewal of this operating permit, at which time the Department will evaluate the facility and issue a public notice with its findings.

VII. EXEMPT ACTIVITIES

The facility's operating permit does not include exempt activities such as office and interior maintenance activities, maintenance shop activities, food preparation facilities, cafeterias and dining rooms, etc. A complete list of exempt activities, as allowed by the Operating Permit rule, can be found at N.J.A.C. 7:27-22.1.

Table 1 - Operating Permit Revision History

RED OAK POWER LLC PI 18195			
Permit Activity Number	Type of Revision	Description of Revision	Final Action Date
BOP190002	Minor Modification	This application was to add Regional Greenhouse Gas Initiative requirements for their three combustion turbines to the permit pursuant to N.J.A.C. 7:27C.	12/17/19
BOP180001	Minor Modification	This modification was to remove the Sulfuric Acid Stack Testing Requirement from Ref#1 at emission unit U1 OS Summary and corresponding operating Scenarios listed below, as Sulfuric Acid test method is unreliable when Ammonia is present. Red Oak plant uses ammonia injection for NOx control. U1, OS Summary Ref # 1,14 U1, OS1, OS4, OS7 Ref# 22, 23 U1, OS2, OS5, OS8 Ref# 9 U1, OS3, OS6, OS9 Ref#8	8/28/18

FACILITY NAME (FACILITY ID NUMBER)
BOP050001

Activity Number assigned by the Department

**New Jersey Department of Environmental Protection
Facility Specific Requirements**

Emission Unit Number assigned by the Facility

Brief description of emission unit

Emission Unit: U40 Sewage Sludge Incinerators
Operating Scenario: OS Summary

OR OS2 Fluidized Bed Incinerator

OS Summary lists all rules and requirements that apply to an emission unit. An emission unit may contain one or more pieces of equipment and corresponding operating scenarios.

OSX denotes the operating scenario number and lists the rules and requirements that apply to a scenario. An operating scenario represents various ways (or scenarios) a piece of equipment is permitted to operate.

Item Number

Description of applicable requirement

Monitoring method to ensure compliance

Recordkeeping to show facility's compliance

Actions and submittals required for the facility

Ref.#	Applicable Requirement	Monitoring Requirement	Recordkeeping Requirement	Submittal/Action Requirement
3	The permittee shall conduct an annual performance test for each pollutant in Table 2 of 40CFR62 Subpart LLL between 11 and 13 calendar months after the previous performance test or within 60 days of a process change. [40 CFR 62.16000(a)]	Other: Conduct the performance test using the test methods, averaging methods and minimum sampling volumes or durations as specified in 40CFR62 Subpart LLL and according to the testing, monitoring and calibration requirements specified in 40 CFR 62.16015(a). [40 CFR 62.16000(a)].	Other: (1) Maintain records of the results of initial, annual and any subsequent performance tests conducted to determine compliance with the emission limits and standards and/or to establish operating limits, as applicable. [40 CFR 62.16025(e)].	Submit a report: Annually to the Administrator and to the Department. The permittee shall submit an annual compliance report as specified in 40 CFR 62. [40 CFR 62.16000(d)]

Rule citation for applicable requirement

Rule citation for monitoring requirement

Rule citation for recordkeeping requirement

Rule citation for submittal/ action requirement

Explanation Sheet for Facility Specific Requirements