

Fact Sheet
Clean Air Act
Prevention of Significant Deterioration of Air Quality (PSD)
Draft Permit

CAITHNESS LONG ISLAND ENERGY CENTER BROOKHAVEN, NEW YORK

This fact sheet was developed under provisions of the Clean Air Act (CAA) for the draft PSD permit which the EPA Region 2 is proposing to issue to Caithness Long Island Energy Center (CLIEC) for the construction and operation of a new 346 MW combined cycle electric generating facility in Brookhaven, Suffolk County, New York.

Background

On January 26, 2005, CLIEC submitted a PSD application for a new combined cycle electric generating facility.

CLIEC submitted other documents on various dates to support its application. This application was determined to be complete as of October 5, 2005, which corresponds to the date on which CLIEC's final submittal was received.

The proposed project is subject to PSD for the following pollutants: nitrogen oxides (NO_x), carbon monoxide (CO), particulate matter/particulate matter of less than 10 microns (PM/PM-10), sulfur dioxide (SO₂) and sulfuric acid (H₂SO₄).

Description of Facility

CLIEC proposes to construct a new electric generating facility in Brookhaven, New York. The proposed facility will operate in combined cycle mode and produce up to 346 MW of electricity. The project will consist of one Siemens Westinghouse Frame 501F combustion turbine generator (CTG), a heat recovery steam generator (HRSG) equipped with natural gas fired duct burners for supplementary firing, and a single steam turbine generator with an air-cooled condenser. CTG/HRSG exhaust gases will be directed into a single stack. Supporting auxiliary equipment will include a dual fuel fired auxiliary boiler, a dew point fuel gas heater and an emergency diesel fire pump.

The proposed CTG will be fueled primarily by natural gas with low-sulfur light distillate oil proposed as a backup fuel. The distillate oil will be used for up to 30 days per year. The duct burner will fire natural gas exclusively. The CTG will control NO_x emissions by utilizing a dry low-NO_x (DLN) combustor during gas firing and water injection during distillate oil firing. A selective catalytic reduction (SCR) system, located in the HRSG, will be used to further reduce NO_x emissions. An oxidation catalyst will be located in the HRSG upstream of the SCR to control emissions of both CO and VOC. Upon leaving the SCR, turbine exhaust gases will be directed to

a single 170-foot stack. In addition, CTG inlet air will be cooled using an evaporative cooler when ambient temperatures are high to improve CTG efficiency and increase generation output. The auxiliary boiler will employ low-NO_x burners (LNB) and flue gas recirculation (FGR) to control emissions of NO_x. The fuel gas heater will use a forced draft burner to minimize NO_x emissions.

The facility will be designed to operate on a continuous basis but may operate at partial loads when it is dispatched. Partial load turbine operation will be limited to between 75 and 100% of turbine load for both natural gas and distillate oil firing.

The proposed facility is considered a new major stationary source. Maximum projected emissions are: 90.8 tons per year of nitrogen oxides (NO_x), 62.9 tons/year of volatile organic compounds (VOC), 271.5 tons/year of carbon monoxide (CO), 42.1 tons/year of sulfur dioxide (SO₂), 90.7 tons/year of particulate matter emissions (PM/PM₁₀), 15.1 tons/year of sulfuric acid mist (H₂SO₄) and 64.1 tons/year of ammonia.

PSD-Affected Pollutants

The CLIEC project is PSD-affected for emissions of the following pollutants: nitrogen oxides (NO_x), carbon monoxide (CO), particulate matter/particulate matter of less than 10 microns (PM/PM-10), sulfur dioxide (SO₂) and sulfuric acid (H₂SO₄). These pollutants are formed in the following ways:

Nitrogen Oxides - NO_x emissions are generated in the Project's combustion turbine, duct burner, auxiliary boiler, fuel gas heater and fire pump. There are two principal forms of NO_x; thermal NO_x and fuel NO_x. During the combustion of fuel, NO_x is formed from the high-temperature oxidation of nitrogen contained in the combustion air (thermal NO_x) and from the oxidation of nitrogen that is bound in the fuel (fuel NO_x).

Carbon Monoxide - The formation of CO in the exhaust of combustion units is the result of incomplete combustion of the fuel. Sources of CO emissions at the facility include the combustion turbine and duct burner, the auxiliary boiler, the fuel gas heater and the fire pump.

Particulate Matter/Particulate Matter of Less than 10 Microns - PM/PM-10 emissions are generated in the combustion turbine, duct burner, auxiliary boiler, gas heater and fire pump. PM/PM-10 emissions from the combustion turbine may be formed from non-combustible constituents in the fuel or combustion air, from products of incomplete combustion or from the formation of ammonium sulfates due to the conversion of SO₂ to SO₃, which is then available to react with ammonia and form ammonium sulfate or ammonium bisulfate post combustion. PM/PM-10 emissions from the boiler occur from incomplete combustion as well as non-combustible constituents in the flue gas stream. PM/PM-10 emissions from the gas fired heater may also be due to products of incomplete combustion. Particulates from oil fired internal combustion engines, such as the diesel fire pump, may result from trace metals present in the fuel, unburned carbon-containing materials and sulfate formation.

Sulfur Dioxide - The project's combustion turbine and duct burner, auxiliary boiler, fuel gas heater and diesel fire pump are all sources of SO₂ emissions. SO₂ emissions from these sources are formed as a result of oxidation of sulfur in the fuel.

Sulfuric Acid Mist - Like SO₂, sulfuric acid formation from the combustion sources is directly related to the sulfur content of the fuel being burned. Sulfuric acid is produced when SO₂ is converted to SO₃ in the presence of a catalyst and is then further combined with water to form H₂SO₄.

Project Control Equipment:

The Project will employ Best Available Control Technology (BACT) to minimize the PSD-affected pollutants described above. The corresponding emission rates are listed in Enclosure I. VOC, a non-attainment pollutant, and ammonia emissions are not subject to PSD and will be addressed in the state permit issued by NYSDEC. The controls identified below for each pollutant satisfy the BACT requirement under PSD.

Nitrogen Oxides - NO_x emissions from the combined cycle unit are controlled through the use of SCR in combination with DLN during natural gas firing and water injection during oil firing. The auxiliary boiler will use FGR and LNB to control emissions of NO_x. NO_x emissions from the fuel gas heater will be reduced by use of forced draft LNB. Limited hours of operation along with good combustion practices will be employed to reduce NO_x emissions from the emergency diesel fire pump.

Carbon Monoxide - CLIEC will install an oxidation catalyst to control CO emissions from the combustion turbine and duct burner. The auxiliary boiler, fuel gas heater and diesel fire pump will all employ good combustion practices to control CO. Limited hours of operation on the auxiliary boiler and fire pump will also help to reduce annual CO emissions.

Particulate Matter/Particulate Matter of Less than 10 Microns - The combustion of clean burning fuels is the most effective means for controlling PM/PM-10 emissions from the combustion units at the proposed facility. PM/PM-10 combustion source emissions will comply with BACT by utilizing proper burner design, good combustion practices and primarily combusting natural gas with low sulfur oil used only as a backup fuel.

Sulfur Dioxide - CLIEC will comply with SO₂ BACT by combusting primarily natural gas in its combustion units. Low sulfur fuel oil (0.04% sulfur by weight) will be used as a backup fuel with restricted hours of operation on an annual basis.

Sulfuric Acid Mist - Like SO₂, sulfuric acid mist will be minimized from the facility's combustion sources through the use of low sulfur fuels.

Basis for Permit Conditions

The permit conditions are based on the requirements of 40 C.F.R. 52.21. These include requirements that owners or operators of a new major stationary source or major modification: meet applicable State Implementation Plan (SIP) emission limitations and emission standards under 40 C.F.R. Part 60 and Part 61; apply best available control technology (BACT) for each pollutant subject to regulation under 40 C.F.R. 52.21(j); and conduct air quality analyses under 40 C.F.R. 52.21 (k)-(p) to demonstrate that emissions would not exceed any NAAQS or PSD increment.

Based on the information submitted by CLIEC, EPA determined that the project is approvable subject to public review. The proposed emission rates are considered BACT and the projected emissions will not cause or contribute to an exceedance of any air quality standards. Also, under Region 2's Environmental Justice policy, CLIEC evaluated the impacts this project would have on surrounding communities. EPA concluded that there would be no adverse or disproportionately high impacts on any communities of concern. The following table shows the results of the modeling analyses.

Table 1. Caithness Bellport Energy Center Air Quality Analysis (ug/m3)

Pollutant	Caithness Maximum Modeled Concentration	EPA Sign. Impact Level	EPA Monitoring de minimis Level	Existing Monitored Concentration (background)	Maximum Modeled + background	NAAQS
SO2						
3 hour	14	25	na	115	129	1300
24 hour	2.2	5	13	79	81.2	365
Annual	2.62x10 ⁻²	1	na	16	16	80
PM-10						
24 hour	2.9	5	10	47	49.9	150
Annual	0.2	1	na	18	18.2	50
NO2						
Annual	0.8	1	14	32	32.8	100
CO						
1 hour	48.7	2000	na	4,255	4,303.7	40,000
8 hour	19.8	500	575	2,530	2,549.8	10,000

Notes:

1. National Ambient Air Quality Standard is the EPA air quality standard for public health.
2. The Significant Impact Level is a fraction of the NAAQS and is used by EPA to determine whether a cumulative modeling analysis is required.
3. The Monitoring de minimis Level is used by EPA to determine whether preconstruction ambient air quality monitoring is required. In this case, it was not required for the purpose of preconstruction concentrations. However, existing monitored background data measured at NYSDEC sites was obtained. This background concentration was added to Caithness= modeled impact in order to determine a total concentration for comparison to the NAAQS.
4. na = There is no applicable monitoring de minimis level for this averaging time.

Compliance Monitoring

To assure compliance, CLIEC is required to perform the following monitoring and testing:

1. operate continuous emissions monitoring systems (CEM) for NO_x, and CO.

2. perform initial stack tests for all pollutants.
3. perform stack tests every five years on the combustion turbine and duct burner and the auxiliary boiler for those pollutants not measured by a CEM.
4. perform visible emissions tests (Method 9 or COM).
5. verify the sulfur content of the fuels fired in the combustion units.
6. monitor and record fuel usage and startup and shutdown events.
7. operate a continuous monitoring system to determine oxygen and stack gas volumetric flow rates.

Administrative Procedures

A 30-day public comment period will commence upon publication of the public notice in the local newspaper(s). If significant interest is expressed for a public hearing and one were held, interested individuals, groups and agencies would be welcome to attend this meeting. At PSD public hearings, any person may appear on his own behalf, or may be represented by counsel or by other representatives. However, EPA has not scheduled a public hearing at this time. Public comments and requests for a public hearing may be submitted during the 30-day period to:

U.S. Environmental Protection Agency
Region II
Air Programs Branch
290 Broadway
New York, New York 10007
Attention: Mr. Steven Riva

The PSD regulations specify procedural requirements (40 CFR '52.21(q)) which include administrative review of the final permit decision. Procedural requirements for administrative review are defined in the Consolidated Permit Regulations codified at 40 CFR Part 124. Only those persons who file comments or participate in the public hearing on the preliminary determination may petition for administrative review except to the extent that changes are made from the draft to final permit decision. For those who do not provide comments, administrative appeal is available only to the extent of changes from today=s draft permit to the final permit decision. In the event of an administrative appeal, upon completion of the appeal process, the final permit decision will be published in the Federal Register as a final agency action. Only those persons who appealed for administrative review may petition for judicial review in the U.S. Court of Appeals and must do so within 60 days of the date of the Federal Register notice.