

**HOLLAND ENERGY FACILITY  
HOLLAND ENERGY, LLC  
BEECHER CITY, ILLINOIS**

**PROJECT SUMMARY**

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**I. INTRODUCTION**

Holland Energy, LLC (Holland) has requested a permit for the construction of a natural gas fired power plant capable of generating approximately 680 MW of electricity.

The project site location is located on the north side of the county line road between Shelby County and Effingham County in Holland Township, Shelby County. The project site is currently undeveloped.

**II. PROJECT DESCRIPTION**

The proposed facility will include two combined cycle units. Each combined-cycle unit will include one combustion turbine generator (CTG), one heat recovery steam generator (HRSG) equipped with supplemental firing capability, and one steam turbine generator (STG). The facility would be fired on natural gas as its primary fuel with capability to fire low-sulfur distillate oil as a backup fuel. Duct burners (supplemental firing) firing natural gas will be used to generate additional heat in the HRSG's.

The units are intended for year-round operation (*i.e.*, up to 8,760 hours per year). The units are limited to 1000 hours per year of operation on backup fuel.

The emissions from each unit are controlled through the use of add-on Selective Catalytic Reduction (SCR) in the HRSG. SCR uses a catalyst operated in an appropriate temperature range that normally is present in one section of the HRSG to control NO<sub>x</sub>, by reaction with ammonia, urea or other similar chemicals. The NO<sub>x</sub> is converted back into nitrogen and oxygen, as originally present in the atmosphere, and water is formed as a byproduct.

In addition to the combustion turbines and HRSG duct burners, the project also includes a single cooling tower to dissipate waste heat from the steam cycle. Hot water from the steam turbine condensers and other heat exchangers at the facility is routed to the cooling towers for cooling. In turn, cooled water from the cooling tower basin is returned to this process equipment. The single cooling tower is common for each of the steam turbines.

Natural gas-fired auxiliary boiler will be used to maintain steam flow and operating temperature within the HRSG's and steam turbine while the combustion turbines are off line. The boiler will also be used to pre-heat natural gas until the HRSG's are at normal operation.

The facility will also be equipped with a single (up to 175) diesel fired emergency fire water pump. Backup fuel will be stored in a 1.8 million gallon storage tank.

### III. PROJECT EMISSIONS

Emissions of combustion products (carbon monoxide (CO), nitrogen oxide (NO<sub>x</sub>), particulate matter/particulate matter <10 microns (PM/PM<sub>10</sub>), sulfur dioxide (SO<sub>2</sub>), volatile organic material (VOM), and hazardous air pollutants (HAPs)) result from the combustion of fuel in the turbines, HRSG duct burners and auxiliary boiler. The cooling towers utilized in conjunction with combined cycle operation are sources of PM emissions. A small amount of VOM emissions will result from the storage and handling of backup fuel.

The potential emissions from the proposed facility are noted below. The emissions are based on operation at maximum load for 8,760 hours per year.

#### Potential Project Emissions (ton/yr)

<u>Pollutant</u>	<u>Project Potential</u>
CO	418
NO <sub>x</sub>	269
PM/PM <sub>10</sub>	261
VOM	41
SO <sub>2</sub>	118

### IV. APPLICABLE REGULATIONS

#### A. GENERAL

The proposed project will comply with applicable state and federal air pollution control laws and rules, including the Illinois Environmental Protection Act, the federal Clean Air Act, the Illinois Air Pollution Control Board emission standards and regulations (35 Ill. Adm. Code: Subtitle B) and applicable federal emission standards.

#### B. ADDITIONAL REQUIREMENTS FOR MAJOR NEW SOURCES

The project is in an area classified as attainment for all pollutants. The new source will be a major stationary source under PSD regulations because, emissions of NO<sub>x</sub>, CO, PM/PM<sub>10</sub>, VOM and SO<sub>2</sub> emissions trigger the applicability of the Prevention of Significant Deterioration Air Quality regulations (PSD), 40 CFR 52.21. Therefore, the proposed project at the Holland Energy Facility constitutes a major new source subject to the additional requirements imposed by the federal rules for PSD.

### V. PREVENTION OF SIGNIFICANT DETERIORATION (PSD)

A project that constitutes a major new source in an attainment area is subject to the federal PSD rules. The PSD rules were established to ensure that new sources will not adversely impact “clean air” areas and will comply with applicable standards.

A PSD review requires: 1) a case-by-case Best Available Control Technology (BACT) determination, taking into account energy, environmental and economic impacts, as well as technical feasibility; 2) an ambient air quality impact analysis, including a baseline determination and dispersion modeling, to determine whether the allowable emissions from the source would cause or contribute to a violation of the applicable PSD increment or National Ambient Air Quality Standard (NAAQS); 3) an assessment of the impact on soils, vegetation and visibility; and, 4) public notice and comment, including an opportunity for public hearing. The Illinois EPA has been delegated authority by the USEPA to administer the federal PSD program.

#### **A. BEST AVAILABLE CONTROL TECHNOLOGY (BACT)**

BACT is defined as an emission limitation based on the maximum degree of pollution reduction determined on a case-by-case basis considering technical, economic, energy and environmental considerations.

A BACT analysis was conducted for NO<sub>x</sub>, CO, PM/PM<sub>10</sub>, VOM, and SO<sub>2</sub>, in order to determine the most appropriate level of control required at the facility for these pollutants. In considering the technical, economic, energy and environmental considerations, the Illinois EPA determined that the project will utilize BACT.

As determined by Illinois EPA, BACT will include use of dry low-NO<sub>x</sub> combustors and water injection on the CTGs and SCR in the HRSGs. The CTG/HRSGs will meet a maximum NO<sub>x</sub> emission rate of 4.5 ppmv at 15% oxygen on an hourly average while firing natural gas and 16 ppmv at 15% oxygen on an hourly average while firing backup fuel. BACT will also include utilization of low-NO<sub>x</sub> burners with the auxiliary boiler to minimize emissions of NO<sub>x</sub>. These practices represent the stringent level of control for NO<sub>x</sub> required on CTGs and combined cycle units in other similar projects across the country.

Good combustion practices will be used in the CTGs, HRSG duct burners and auxiliary boiler to minimize emissions of CO, VOM, and PM/PM<sub>10</sub>.

Low-sulfur distillate oil fuel will be utilized to minimize SO<sub>2</sub> emissions.

The cooling towers at the Holland Energy Facility will be equipped with highly efficient (0.0005%) drift eliminators to minimize loss of water droplets from the cooling towers and associated PM/PM<sub>10</sub> drift.

#### **B. AIR QUALITY ANALYSIS**

An ambient air quality analysis was conducted by the consulting firm, ENSR, on behalf of Holland Energy to assess the impacts of the increased emissions due to the proposed project.

Under the PSD rules, this analysis must determine whether the proposed project will cause or contribute to a violation of any applicable air quality standard.

Modeling was done for NO<sub>x</sub>, CO, PM/PM<sub>10</sub>, and SO<sub>2</sub> incorporating the proposed emissions increase at the Holland Energy Facility. The analysis performed conforms to the guidance and requirements of the USEPA and the Illinois EPA.

Holland Energy has provided adequate information to determine that proposed emission increases will not cause a violation of the National Ambient Air Quality Standards (NAAQS) or the allowable increment levels established under the PSD regulations. The significant impact level was exceeded for NO<sub>x</sub>, PM<sub>10</sub>, and SO<sub>2</sub>, which required additional modeling to be performed. The additional modeling includes existing emission sources in the area and background concentrations.

<u>Pollutant</u>	<u>Averaging Period</u>	<u>Maximum Predicted Impact (µg/m<sup>3</sup>)</u>	<u>Significant Impact Level (µg/m<sup>3</sup>)</u>	<u>NAAQS (µg/m<sup>3</sup>)</u>
NO <sub>x</sub>	Annual	2.17	1	100
PM <sub>10</sub>	24-hour	21.73	5	150
PM <sub>10</sub>	Annual	1.97	1	50
CO	1-hour	480.51	2,000	40,000
CO	8-hour	195.57	500	10,000
SO <sub>2</sub>	3-hour	56.05	25	1,300
SO <sub>2</sub>	24-hour	21.28	5	365
SO <sub>2</sub>	Annual	1.89	1	80

Maximum predicted impacts are worst case

An analysis was also conducted for the impact of the facility's VOM emissions on ozone air quality using a conservative screening technique developed by USEPA. The analysis showed that the project would not cause a violation of the ozone air quality standard as limited by the proposed permit.

### C. ASSESSMENT OF ENVIRONMENTAL IMPACTS

The ambient air quality assessment performed also assessed the potential impact of the Holland Energy Facility project on soils, vegetation and visibility. The Illinois EPA concluded that the project would not cause any adverse effect to these environmental media.

## VI. PROPOSED PERMIT

The conditions of the proposed permit contain limitations and requirements on the electric generation activities. The permit identifies the measures that must be used to control NO<sub>x</sub>, CO, PM/PM<sub>10</sub>, VOM, and SO<sub>2</sub> emissions from the proposed combustion turbines, HRSG's and auxiliary boiler. The

permit also establishes appropriate compliance procedures, including inspection practices, recordkeeping requirements and reporting requirements.

## **VII. REQUEST FOR COMMENTS**

It is the Illinois EPA's preliminary determination that the proposed permit meets all applicable state and federal air pollution control requirements. The Illinois EPA is therefore proposing to issue a permit for construction at the Holland Energy Facility.

Comments are requested on this proposed action by the Illinois EPA and the proposed conditions on the draft permit prior to [Date].