UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
Region 4
Atlanta, Georgia

Preliminary Determination & Statement of Basis

Shady Hills Generating Station Project
for

Shady Hills Power Company, LLC

September XX, 2013

PSD-EPA-R4013

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1.0 Introduction

Shady Hills Power Company, LLC (the Applicant or Shady Hills) has applied for a Prevention of Significant Deterioration (PSD) air permit for the emission of Greenhouse Gases (GHGs) pursuant to the Clean Air Act (CAA) from the U.S. Environmental Protection Agency Region 4 for the proposed Shady Hills Generating Station Project (SHGS or Project). Shady Hills is proposing to build two additional, simple cycle combustion turbines (Model: GE 7FA.05). The GE7FA.05 output is 218 megawatts (MW) (gross) when firing natural gas and 223 MW (gross) when firing ultra-low sulfur diesel (ULSD) fuel oil. SHGS will result in an increase of 69 tons per year (TPY) of total suspended particles (TSP)/particulate matter with an aerodynamic diameter equal to or less than ten microns (PM_{10})/particulate matter with an aerodynamic diameter equal to or less than 2.5 microns ($PM_{2.5}$), 397 TPY of nitrogen oxides (NO_x), and 923,502 TPY of GHG emissions. The existing facility and proposed SHGS is located within the City of Spring Hill, in Pasco County, Florida. The Standard Industrial Classification No. for this facility is 4911 *Electric Services*.

The EPA Region 4 is the agency responsible for implementing and enforcing PSD requirements for GHG sources in Florida. The State of Florida, through the Florida Department of Environmental Protection (FDEP), implements and enforces PSD requirements for regulated pollutants other than GHGs. The EPA has completed review of the application and supplemental materials and is proposing to issue Permit No. PSD-EPA-R4013 to Shady Hills for the Project subject to the terms and conditions described in the permit. The draft permit incorporates the applicable requirements for GHGs from the federal PSD program.

This document serves as a fact sheet, preliminary determination, and statement of basis for the draft permit. It provides an overview of the project, a summary of the applicable requirements, the legal and factual basis for the draft permit conditions, and the EPA's analysis of key aspects of the application and permit such as the best available control technology (BACT) analysis for GHG emissions. Additional information can be found in the draft permit accompanying this document as well as in the application materials and administrative record for this project, as discussed in Section 8.0.[1]

Section 2.0 provides applicant and facility information followed by a description of the proposed project in Section 3.0. Section 4.0 lists the legal authority and regulatory applicability. Pollutants emitted and emissions units are discussed in Section 5.0. The BACT for all applicable units is listed in Section 6.0. Section 7.0 includes a description of additional requirements and how this project complied with them. Finally, Section 8.0 gives information about public participation.

[1] The procedures governing the issuance of PSD permits are set forth at 40 CFR part 124, subparts A and C. *See* 40 CFR §§ 52.21(q) and 124.1. Accordingly, EPA has followed the procedures of 40 CFR part 124 in issuing this draft permit. This Preliminary Determination describes the derivation of the permit conditions and the reasons for them as provided in 40 CFR § 124.7, and also serves as a Fact Sheet as provided in 40 CFR § 124.8.

2.0 Applicant Information

2.1 Applicant Name and Mailing Address

Shady Hills Power Company, LLC
800 Long Ridge Road
Stamford, Connecticut 06927

2.2 Facility Location

Shady Hills is proposing to modify the existing Shady Hills Generating Station located on 14240 Merchant Energy Way within the City of Spring Hill, in Pasco County, Florida. The site location is illustrated in Figures 2-1 and 2-2 below.

Figure 2-1 Pasco County, FL

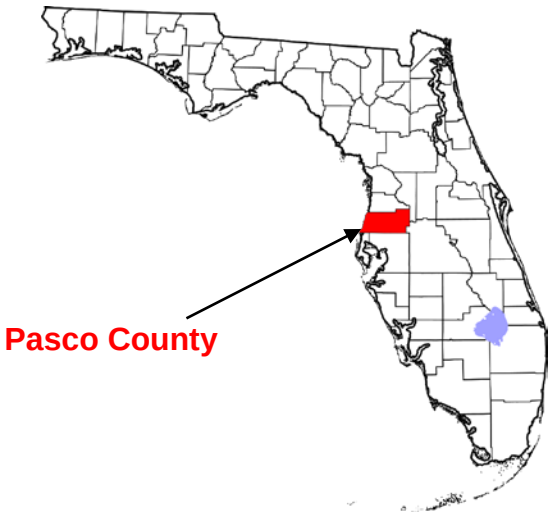
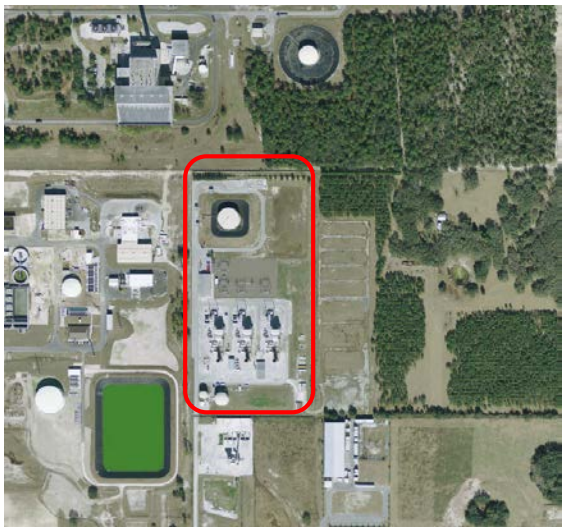


Figure 2-2 Shady Hills Project Boundary



3.0 Proposed Project

Shady Hills has applied for a GHGs PSD air permit pursuant to the CAA from the EPA Region 4 for the proposed Project. Shady Hills is proposing to build two additional, simple cycle combustion turbines (Model: General Electric 7FA.05) [Emissions unit (EU) 005 and 006]. The GE 7FA.05 output is 218 MW (gross) when firing natural gas and 223 MW (gross) when firing ULSD fuel oil. The simple cycle combustion turbine (SCCT) will have low-nitrogen oxide combustion technology when firing natural gas and water injection for NO_x control when firing ULSD fuel oil. The primary fuel will be natural gas with ULSD fuel oil with sulfur content is 0.015 percent as backup fuel. The heat input per turbine would be 2,135 million British thermal units per hour (MMBtu/hr), higher heating value (HHV). Ancillary equipment consists of a 2.5 MW emergency generator (EU 007), a natural gas fuel heater (EU 008), a 2.8 million gallon (Mgal) ULSD fuel oil storage tank (EU 009), an SF_6 circuit breaker (EU 010), and new on-site natural gas pipeline.

The project will result in a net emission increase greater than PSD threshold limits for TSP, PM_{10}, $PM_{2.5}$, NO_x, and GHGs. On April 6, 2012, the FDEP issued their portion of the construction permit to the applicant (PSD-FL-402A/1010373-012-AC), which addressed all pollutants mentioned except for GHGs. The expiration date of the revised construction permit is July 31, 2015. The EPA is responsible for issuing the GHG portion of the PSD permit. The Project cannot be constructed until both the FDEP and the EPA PSD permits are issued and effective.

SHGS will result in a net increase of 69 TPY of TSP/PM_{10}/$PM_{2.5}$, 397 TPY of NO_x, and 923,502 TPY of GHG emissions on the basis of carbon dioxide equivalent (CO_2e). Based on emissions estimates and the applicable permitting thresholds, SHGS will have significant emissions of GHGs on a mass and CO_2e basis and is subject to the PSD program for GHGs as the measured pollutant. Based on Shady Hills's permit application, GHG emissions will experience a net increase of 923,502 TPY of CO_2e.

Shady Hills's existing facility consists of three, dual-fuel, 170 MW (nominal) GE PG7241FA simple cycle combustion turbine (SCCT)-electrical generators, three 75 feet high exhaust stacks, and one 2.8 million gallon ULSD fuel oil storage tank. The combustion turbine units can operate in simple-cycle mode and intermittent duty mode. The units are equipped with dry low-NO_x combustors and water injection capability. The three units are regulated under Phase II of the Federal Acid Rain Program. The existing facility and the Project are located at 14240 Merchant Energy Way within the City of Spring Hill, in Pasco County, Florida. The Project will be located within the existing Shady Hills boundaries. The facility has been in operation since 2002 and operates during peak hours of electrical use.

EUs 001 through 004 were constructed under PSD-FL-280/1010373-001-AC and authorized to operate pursuant to FDEP final title V permit no. 1010373-003-AV. The three 170 MW SCCTs (EUs 001-003) are allowed to fire natural gas and No. 2 fuel oil or higher grade. EU 004 is the existing 2.8 Mgal ULSD fuel oil storage tank.

The applicant proposed two different operating scenarios. The first (base) scenario is the installation and operation of two SCCTs for an average of 3,390 hours per year at full load per CT (but not more than 5,000 hours/year for a single unit). The CTs will use natural gas as the primary fuel with ULSD fuel oil used as a backup fuel for up to the equivalent of 1,000 combined hours per year (hr/yr) at base load conditions.

The second (alternate) scenario consists of the installation and operation of only one SCCT for a maximum of 3,390 hours per year of which up to 750 hr/yr would using ULSD fuel oil as backup. After reaching the first 500 hours of firing ULSD fuel oil, the remaining 250 hr/year will be under an operating hour trade-off mechanism consisting of 390 hour of natural gas only, or 78 hours of ULSD fuel oil only, or a combination following a 5:1 trade-off ratio. In this situation, the worst-case emissions scenario is where the CT operates using ULSD fuel oil for the maximum amount of 750 hours per year and the CT would be able to run with natural gas for a maximum 1,640 hrs/yr.

Natural gas for SHGS will be transported to the facility via pipeline. No onsite storage will be provided for natural gas. New onsite pipeline and natural gas supply will be installed. ULSD oil will be delivered to the facility by truck and stored in a new ULSD fuel oil storage tank with a 2.8 Mgal capacity.

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4.0 Legal Authority and Regulatory Applicability

4.1 EPA Jurisdiction

In 2010, the EPA established a federal implementation plan (FIP) to apply in each state that had not submitted by their established deadline a corrective state implementation plan (SIP) revision to apply their CAA PSD program to sources of GHGs. *See* 75 FR 82246 (Dec. 30, 2010). The State of Florida is subject to the FIP; therefore, the EPA is issuing this GHG PSD permit. FDEP is responsible for issuing a separate construction and title V operating permit for the Project for regulated pollutants other than GHGs.

4.2 Prevention of Significant Deterioration (PSD)

The PSD program, as set forth at 40 CFR § 52.21, is applicable to major sources such as this proposed project. The objective of the PSD program is to prevent significant adverse environmental impact from air emissions by a proposed new or modified source. The PSD program limits degradation of air quality to that which is not considered "significant." The PSD program requires an assessment of air quality impacts of the proposed project, and also requires the utilization of BACT as determined on a case-by-case basis taking into account energy, environmental and economic impacts, and other costs.

Under the PSD regulations, a stationary source is "major" if, among other things, it emits or has the potential to emit (PTE) 100 TPY or more of a "regulated New Source Review (NSR) pollutant" as defined in 40 CFR § 52.21(b)(50) and is "subject to regulation" as defined in 40 CFR § 52.21(b)(49) and the stationary source is one of a named list of source categories. In addition to the preceding criteria, any stationary source is also considered a major stationary source if it emits or has the potential to emit 250 TPY or more of a regulated NSR pollutant. *See* 40 CFR § 52.21(b)(l). "Potential to emit" is defined as the maximum capacity of a source to emit a pollutant under its physical and operational design. "Any physical or operational limitation on the capacity of the source to emit a pollutant, including air pollution control equipment and restrictions on hours of operation or on the type or amount of material combusted, stored or processed, shall be treated as part of its design if the limitation or the effect it would have on emissions is enforceable." *See* 40 CFR § 52.21(b)(4).

Beginning on January 2, 2011, GHGs became subject to regulation under the PSD major source permitting program as a regulated NSR pollutant when emitted in amounts greater than certain applicable thresholds. GHGs are a single air pollutant defined in 40 CFR 52.21(b)(49)(i) as the aggregate group of the following six gases:

- Carbon dioxide (CO_2);
- Nitrous oxide (N_2O);
- Methane (CH_4);
- Hydrofluorocarbons (HFCs);
- Perfluorocarbons (PFCs); and
- Sulfur hexafluoride (SF_6).

Due to the nature of GHGs and their incorporation into the definition of "subject to regulation", the determination of whether a source is emitting GHGs in an amount that triggers PSD applicability involves a calculation of the source's CO_2e emissions as well as its GHG mass emissions. Consequently,

when determining the applicability of PSD to GHGs, there is a two-part applicability process that evaluates both:

- The sum of the CO_2e emissions in TPY of the six GHGs, in order to determine whether the source's emissions are a regulated NSR pollutant; and, if so;
- The sum of the mass emissions in TPY of the six GHGs, in order to determine if there is a major source or major modification of such emissions.

For PSD permits issued on or after July 1, 2011, PSD applies to new sources as well as existing sources not already subject to title V that emit, or have the potential to emit, at least 100,000 TPY CO_2e and greater than zero TPY on a mass basis. In addition, sources that emit or have the potential to emit at least 100,000 TPY CO_2e and that undertake a modification that increases net emissions of GHGs by at least 75,000 TPY CO_2e and equal to or greater than 100/250 TPY on a mass basis will also be subject to PSD requirements.[2]

Table 5-2 lists the PTE for each regulated NSR pollutant from the Project, as well as the significant emission rate for each regulated NSR pollutant. The permit application and Section 5.0 of this document contain information on the emissions factors used to determine the PTE for the Project.

SHGS is an existing PSD source and the net increase in GHG emissions associated with the modification exceeds the threshold of 75,000 TPY. Section 6.0 of this document contains a discussion of the BACT analysis.

4.3 Title V

Upon issuance of this PSD permit, the State of Florida will incorporate these permit conditions into the existing title V permit for the facility.

4.4 New Source Performance Standards (NSPS)

On September 20, 2013, EPA signed a proposed NSPS that could influence the ultimate emission requirements for this source. The definition of BACT in PSD rules at 40 CFR 52.21(b)(12) states that "in no event shall application of best available control technology result in emissions of any pollutant which would exceed the emissions allowed by any applicable standard under 40 CFR parts 60 and 61." Although this facility may be within the source category covered by the proposed NSPS, the proposed NSPS emission limits are not a controlling floor for BACT purposes since the proposed NSPS is not a final action and the proposed standard may change. However, the NSPS is an independent requirement that will apply to any source subject to the NSPS that commences construction after the date the NSPS is proposed (unless that source is covered by a transitional source exemption adopted in the NSPS). Thus, this facility may ultimately be subject to, and need to comply with, the NSPS after it is finalized, even if the emissions limits in the final permit are higher than the NSPS. *See* EPA, "PSD and Title V Permitting Guidance for Greenhouse Gases" (March 2011) at page 25.

[2] Prevention of Significant Deterioration and Title V Greenhouse Gas Tailoring Rule, 75 FR 31514 (3 June 2010).

5.0 Project Emissions

The maximum annual potential emissions for the Project include GHG emissions from the SCCT, natural gas heater, emergency generator, and ULSD fuel oil storage tank. For the potential to emit (PTE) calculations, two scenarios were proposed. The worst-case emissions scenario was used in the annual potential emissions. Table 5-1 presents the maximum annual potential SHGS emissions from the operation of two SCCTs, Model GE7FA.05. This table addresses the relevant regulated NSR pollutants, as required under PSD. Table 5-2 summarizes the maximum annual emissions changes.

Table 5-1SHGS Potential to Emit Estimates, using GE 7FA.05[3]

EU ID No.	Emission Unit Description	Potential to Emit Estimates (TPY)									
		SO_2	TSP	PM_{10}	$PM_{2.5}$	NO_x	CO	VOC	Sulfuric Acid Mist	Lead	GHGs (CO_2e)
005 & 006	Two (2) SCCTs GE7FA.05[4]	29.6	69.0	69.0	69.0	386.3	88.4	13.6	4.5	0.015	918,618
007	2.5 MW Emergency Generator	0.01	0.35	0.35	0.35	8.91	6.17	2.38	NA	NA	859
008	10 MMBtu/hr Natural Gas Heater	0.07	0.12	0.12	0.12	1.61	1.35	0.09	NA	NA	3,965
009	2.8 Mgal ULSD Fuel Oil Storage Tank	NA	NA	NA	NA	NA	NA	2.02	NA	NA	NA
010	Three SF_6 Circuit Breakers	NA	NA	NA	NA	NA	NA	NA	NA	NA	12
Fugitives	On-site Pipeline and Natural Gas Supply	NA	NA	NA	NA	NA	NA	NA	NA	NA	47
	Total Project	**29.7**	**69.5**	**69.5**	**69.5**	**396.8**	**95.9**	**18.1**	**4.5**	**0.015**	**923,502**

[3] Information from Table 2-7 Summary of Maximum Potential Annual Emissions for the Shady Hills Generating Station Project as submitted in the application to FDEP dated July 9, 2010.
[4] Represents the worst-case (baseload) scenario. The alternate scenario is the construction of one SCCT.

Table 5-2 Summary of Maximum Annual Emissions Changes

Pollutant	PTE (TPY)	Significant Emission Rate (TPY)	PSD Review Required
SO_2	29.71	40	No
TSP	69	25	**Yes**
PM_{10}	69	15	**Yes**
$PM_{2.5}$	69	10	**Yes**
NO_x	386.3	40	**Yes**
CO	96	100	No
VOC (as methane)	18	40	No
Sulfuric Acid Mist	5	7	No
Lead	0.015	0.6	No
GHGs (CO_2e)	**923,502**	75,000 (subject to regulation threshold)	**Yes**

As seen in the emissions summary tables, the emissions limits are based upon net changes to emissions associated with future equipment.

5.1 Emission Unit Analysis

Emissions calculations for equipment used during operation of SHGS were made based on the assumptions described below.

EU 005 and 006 – Two 223 MW GE7FA.05 SCCTs

Performance, estimated maximum hourly emissions, and exhaust information representative of each SCCT operating at base load conditions (100% load) in simple cycle mode are presented in Table 5-1 when firing natural gas and ULSD oil firing. The data are presented for a maximum heat input rate of 2,265 MMBtu/hr when firing ULSD fuel oil. Maximum potential annual emissions for the SCCTs for regulated air pollutants are based on an ambient temperature of 59°F, 60% relative humidity, and 14.7 pounds per square inch (psi). The turbine inlet temperature (59°F) is conservative, since the annual average temperature is slightly higher than 59°F. The volumetric flow rate is 2,780,256 actual cubic feet per minute (acfm).

The applicant proposed two potential scenarios, the base scenario and the alternate scenario. In the base scenario two CTs are built. To produce the maximum annual emissions, it is assumed that each CT would operate for 3,390 hours per year. Of the 3,390 operating hours, an average of 2,890 hr/CT/yr are assumed to be natural gas firing only. One single turbine can operate for not more than 5,000 hours per year. For the remaining operating hours, the CTs are assumed to run on ULSD fuel oil for a maximum of 1,000 hr/CT/yr combined. The alternate scenario proposes the construction of only one CT. It is assumed that it will operate for a maximum 3,390 hours per year. Of the 3,390 operating hours, an average of 1,640 hr/CT/yr are assumed to be natural gas firing only. The other 750 operating hours, the applicant proposed to run a maximum of 500 hours on ULSD fuel oil and apply a trade-off mechanism for the rest of the 250 operating hours. The trade-off consists of natural gas versus ULSD fuel oil at 5:1 ratio.

EU 007- 2,500 kW Emergency Generator

SHGS will be equipped with one 2,500 kilowatt (kW) emergency generator firing ULSD fuel oil. This emergency generator will be used when electric power is not available in situations such as plant power outages and black start conditions. Normally, these emergency generators would be operated 1 to 2 hours per month for maintenance and reliability testing. PTE emissions were calculated based on a maximum of 500 hours of operation. The applicant will meet the requirements of 40 CFR 60.4211(f) limiting non-emergency use of the emergency generator to 100 hr/yr.

EU 008- 10 MMBtu/hr Natural Gas Heater

SHGS may include one natural gas-fired fuel heater. This heater will be indirectly-fired with natural gas only and utilize a heat transfer fluid for heating the natural gas. This heater will have a maximum heat input rate of 10 MMBtu/hr (HHV) or less and will be used as necessary to heat natural gas above the dew point.

EU 009- 2.8 Mgal ULSD Fuel Oil Storage Tank

ULSD fuel oil will be trucked to the facility and stored in a new aboveground storage tank at the facility. This tank has a rated storage capacity of approximately 2.8 million gallons (67,000 barrels). This is a source of negligible amounts of GHG emissions.

EU 010 – Circuit Breakers

Three new circuit breakers containing sulfur hexafluoride (SF_6) is proposed. The breaker provides for electrical insulation and interruption of electrical current. The proposed circuit breakers are designed as totally enclosed pressure system with minimal potential for SF_6 emissions.

Fugitives – On-Site Pipeline and Natural Gas Supply

New pipelines will be installed to supply natural gas to the new SCCTs and the natural gas heater.

5.2 Compliance Methodology (Monitoring, Recordkeeping, and Reporting)

The applicant proposed to monitor compliance with the CO_2e BACT limits for the SCCTs (EU 005 & 006) at all times through the installation of a continuous monitoring system. The monitored data (including gross energy output rate, CO_2 mass emission rate, heat input rate) will be used to determine CO_2e emissions based on 40 CFR Part 75 for CO_2 emissions. The applicant will calculate, record and maintain record files according to requirements in the permit.

The applicant will limit the hours of operation of the emergency generator (EU 007) to 100 hours per 12-month rolling total for maintenance and testing purposes (in accordance to 40 CFR 63 Subpart ZZZZ). The natural gas heater (EU 008) will be limited to a maximum of 3,965 TPY of CO_2e emissions. Work Practice Standards will be required to minimize GHGs from the circuit breakers (EU 010) and fugitive emissions from the natural gas pipeline.

6.0 Best Available Control Technology (BACT) and Recordkeeping Requirements

A major modification of a major stationary source subject to PSD requirements is required to apply BACT for each pollutant subject to regulation under the CAA that it would have the potential to emit in significant amounts. *See* 40 CFR § 52.21(j). Based on the emissions inventory for SHGS, summarized in Table 5-2, Shady Hills has the potential to emit NOx, TSP/PM_{10}/$PM_{2.5}$, and GHGs in quantities that equal or exceed the significant emission rate. Based on their authority, FDEP has permitted the NO_x, TSP, PM_{10}, and $PM_{2.5}$ emissions for the Project. However, the EPA is responsible for permitting the GHG emissions. Therefore, BACT must be determined for each emission unit which emits GHGs as part of the EPA-issued permit.

The two simple cycle combustion turbines are included in the source's potential to emit, as required by 40 CFR 52.21(b)(4), and are subject to operating limits as well as monitoring, recordkeeping and reporting requirements to ensure they will not exceed the potential emissions assumed in the application and impact review. In addition, the application includes an emergency generator, a natural gas heater, a ULSD fuel oil storage plant, an electric breaker and new on-site natural gas pipeline, which are necessary support equipment for the two SCCTs. These are also subject to operating limits, monitoring, recordkeeping and reporting requirements.

BACT is defined in the applicable permitting regulations at 40 CFR § 52.21(b)(12), in part, as:

> *an emissions limitation (including a visible emission standard) based on the maximum degree of reduction for each pollutant subject to regulation under the Act which would be emitted from any proposed major stationary source or major modification which the Administrator, on a case-by-case basis, taking into account energy, environmental, and economic impacts and other costs, determines is achievable for such source or modification through application of production processes or available methods, systems, and techniques, including fuel cleaning or treatment or innovative fuel combustion techniques for control of such pollutant. In no event, shall application of best available control technology result in emissions of any pollutant which would exceed the emissions allowed by any applicable standard under 40 CFR parts 60 and 61. If the Administrator determines that technological or economic limitations on the application of measurement technology to a particular emissions unit would make the imposition of an emissions standard infeasible, a design, equipment, work practice, operational standard, or combination thereof, may be prescribed instead to satisfy the requirement for the application of best available control technology.*

The CAA contains a similar BACT definition, although the 1990 CAA amendments added "clean fuels" after "fuel cleaning or treatment" in the above definition. *See* CAA § 169(3).

On December 1, 1987, the EPA issued a memorandum describing the top-down approach for determining BACT. *See, e.g., In re Prairie State Generating Co.*, 13 E.A.D. 1 (EAB 2006). In brief, the top-down approach provides that all available control technologies be ranked in descending order of control effectiveness. Each alternative is then evaluated, starting with the most stringent, until BACT is determined. The top-down approach consists of the following steps:

Step 1: Identify all available control technologies.

Step 2: Evaluate technical feasibility of options from Step 1 and eliminate options that are technically infeasible based on physical, chemical and engineering principles.

Step 3: Rank the remaining control technologies from Step 2 by control effectiveness, in terms of emission reduction potential.

Step 4: Evaluate the most effective controls from Step 3, considering economic, environmental and energy impacts of each control option. If the top option is not selected, evaluate the next most effective control option.

Step 5: Select BACT (the most effective option from Step 4 not rejected).

6.1 GHG BACT Analysis for two 223 MW GE7FA.05 SCCTs

Typically, a base load power generating unit consists of combined cycle combustion turbines (CCCTs) and other ancillary equipment. CCCTs operate at a higher efficiency. However, Shady Hills is a peaking plant. Electric utilities primarily use simple-cycle combustion turbines as peaking or backup units. Their relatively low capital costs and quick start-up capabilities make them ideal for partial operation to generate power at periods of high demand or to provide ancillary services.[5] Peaking power is needed during periods of high energy demands, for example in the afternoons. Therefore, since the CCCTs have a longer startup and shutdown period, Shady Hills requires a combustion turbine that is capable of a short startup period. Simple cycle CTs are suitable for this purpose.

The applicant discussed the challenges of installing CCCTs for this particular project. As described above, this Project has the objective of expanding the Shady Hills operations by increasing the amount of peaking power generated. Consistent with this objective, the applicant has agreed to limit its hours of operation to no more than 3,390 hours per CT annually. The EPA agrees with this assessment, consequently, the CCCTs were considered a redefinition of the source and were not considered in the BACT analysis.

Step 1: Identify all available control technologies

The applicant identified the following available control technologies in their permit application dated September 21, 2012, for the proposed two 223 MW GE7FA.05 simple cycle combustions turbines:

1. Clean Fuels
2. Energy Efficiency
3. Carbon Capture and Storage (CCS)

In addition, the EPA requested that Shady Hills submit justification for the use of ULSD fuel oil as a backup, along with the appropriate BACT analysis, since a complete BACT analysis should also include the evaluation of clean fuels and combustion of natural gas generally results in lower GHG emissions than does the combustion of ULSD fuel oil.

[5] EPA OAQPS Economic Impact Analysis of the Proposed Stationary Combustion Turbines NESHAP , Final Report, November 2002, http://www.epa.gov/ttnecas1/regdata/IPs/Stationary%20Combustion%20Turbines_IP.pdf

Clean Fuels: Clean fuels fall under the general category of lower polluting processes/practices. Natural gas is an inherently cleaner burning fuel that is ubiquitous in the US and can be produced domestically[6]. The combustion of natural gas emits about 30% less CO_2 than oil.

The applicant considered two scenarios for clean fuels. The first scenario is using 100% dedicated natural gas operation. The second scenario includes a range of 750 hr/yr to 1,000 hr/yr ULSD oil fuel burning along with natural gas as the primary fuel. ULSD with 0.015% sulfur is proposed as the backup fuel.

***Energy Efficiency*:** Energy efficiency falls under the general category of lower polluting processes/practices. Applying technologies, measures and options that are energy efficient translates not only in the reduction of emissions of the particular regulated NSR air pollutant undergoing BACT review for GHGs, but it also may achieve collateral reductions of emissions of other pollutants. There are different categories of energy efficient improvements:

- Technologies or processes that maximize the efficiency of the individual emissions unit, and
- Options that could reduce emissions by improving the utilization of thermal energy and electricity that is generated and used onsite.

When the efficiency of the power generation process is increased, less fuel is burned to produce the same amount of electricity. This provides the benefits of lower fuel costs and reduced air pollutant emissions (including GHGs).

***Carbon Capture and Storage (CCS)*:** Carbon capture and storage (CCS) falls under the category of add-on controls, which are air pollution control technologies that remove pollutants from a facility's emissions stream. CCS is an add-on pollution control technology that is available for large CO_2 emitting facilities including fossil fuel-fired power plants and industrial facilities with high purity CO_2 streams. As a result, CCS should be considered in Step 1 of the BACT analysis. CCS is composed of three main components: CO_2 capture and/or compression, transport, and storage.

Deep saline formations, which are layers of porous rock, saturated with brine present a potential for geologic storage of CO_2. However, there is not as much experience with saline formations as there is acquired through resource recovery from oil and gas reservoirs and coal seams. There is ongoing research focused on storage in organic rich shale, which is a thin horizontal layer of sedimentary rock with low vertical permeability and in basalt formations, which are geologic formations of solidified lava. Other possible options include liquid storage in deep ocean areas.

Step 2: Eliminate technically infeasible control options

To establish that an option is technically feasible, the permitting record should show either that an available control option has been demonstrated in practice or is available and applicable, with the term "applicable" generally meaning a technology can reasonably be installed and operated on the source type under consideration.

***Clean Fuels*:** The use of natural gas as the primary fuel to run the SCCTs is technically feasible and is being proposed for the SHGS simple cycle CTs. Two scenarios were considered: exclusively using

[6] http://www.epa.gov/cleandiesel/technologies/fuels.htm

natural gas to run the CTs and using natural gas as the primary gas along with ULSD oil as the backup fuel.

***Energy Efficiency*:** Efficient power generation is technically feasible and is being proposed for the SHGS simple cycle CTs. As a reference, Shady Hills considered the GHG BACT analysis for Puget Sound Energy Fredonia Generating Station Expansion Project located in Mount Vernon, Washington, dated October 2011. On this BACT analysis, Puget Sound analyzed six different turbines, similar in capacity and from different manufacturers (*i.e.*, General Electric (GE) LMS100, GE LM6000, GE 7FA.05, Siemens, 5000F4, and P&W FT8-3). Shady Hills decided to focus their BACT analysis on those SCCTs that were the equal or higher in efficiency than the GE 7FA.05 model.(*i.e.*, GE 7FA.05, LMS 100, LM 6000). The GE 7FA.05 is the latest version of the GE 7FA CTs. It is more efficient than previous models, 7FA.04 and 7FA.03.

Additionally, on the response to the EPA's request for additional information dated November 30, 2012, the applicant confirmed that at the moment no new more efficient turbine models of similar size to the GE 7FA.05 has become available since October 2011.

***Carbon Capture and Storage (CCS)*:** The EPA recognizes the logistical hurdles that the installation and operation of a CCS system presents which set this pollution technology apart from other add on controls that are typically used to reduce emissions of other regulated pollutants. It should also be noted that, while CCS may be available, all current CCS projects for power plants are either in the demonstration stage or newly permitted and there have been no CCS demonstrations on simple cycle combustion turbines. Logistical hurdles identified by the applicant for CCS include obtaining contracts for offsite land acquisition (including the availability of land), the need for funding (including, for example, government subsidies), timing of available transportation infrastructure, developing a site for secure long term storage and environmental permitting for underground GHG sequestration. Each of the three aspects of CCS is discussed below:

> *Carbon Capture:* The EPA Region 4 considered the EPA Region 9's Pio Pico Energy Center (PSD Permit Number SD 11-01) Fact Sheet and Ambient Air Quality Impact Report for the main approaches to carbon capture.[7] As with the Pio Pico project, post-combustion capture using an amine solvent would be the CO_2 capture approach that is most applicable to the simple cycle gas turbines in the Shady Hills project. Furthermore, as determined in the Pio Pico BACT analysis, the EPA believes that post-combustion capture is technically infeasible due to the variable operation of simple cycle combustion turbines and the flue gas cooling and heat integration issues. Please refer to the cited document for additional information on the feasibility of post-combustion capture approach for simple cycle gas turbines.
>
> *Carbon Transport:* The Sunniland Trend's most northern tip is in Lee County; however, the Project is located in Pasco County. The distance between the Project's site and Lee County is approximately 160 miles by road. Florida's lack of infrastructure to transport CO_2 via pipeline adds to the hurdle of transporting the captured CO_2. The closest CO_2 enhanced oil recovery site with a connection via pipeline is located in Mississippi[8].

[7] Pio Pico Energy Center (PSD Permit Number SD 11-01) Fact Sheet and Ambient Air Quality Support Report, June 2011, pp 15-22.
[8] Carbon Dioxide Enhanced Oil Recovery: Untapped Domestic Energy Supply and Long Term Carbon Storage Solution, United States Department of Energy, March 2010.

Carbon Storage: The Sunniland Trend in South Florida is an arcuate trend about 235 kilometers long by 30 kilometers wide that has supported oil production from the Sunniland Formation for over 60 years. The individual oil fields within the Trend have an average porosities range of 15-18%, and the potential to serve as CO_2 sequestration reservoirs due to their high porosity and proven ability to trap hydrocarbon for millennia. The non-oil-bearing porous intervals of the Sunniland Formation along the Trend have relatively high porosities as well, with an average porosity range of 10-20%. All porous intervals in the Sunniland Formation within the extent of the Trend, including the oil-bearing intervals, have the potential to store approximately 1.2 billion tons of CO_2, which could potentially support CO_2 sequestration for multiple large-scale power plants in the southeastern United States for their entire 40 year lifespan.

The Sunniland Formation is an example of the large CO_2 storage capacities that are potentially available in depleted oil and gas basins if all porous units, including those which are non-oil bearing, are considered for storage.[9] As part of the conclusion for this study, the researchers recommended further geophysical evaluation to have a better determination of the suitability of the upper seal prior to the implementation of any CO_2 injections into the Sunniland Formation.

The applicant believes that CCS is technically infeasible for the Shady Hills project; however, the applicant included a CCS economic analysis for consideration in Step 4 of the BACT analysis. Based on the technical barriers to capture CO_2, as identified and discussed in the Pio Pico permit documents, as well as the potential concerns raised by the applicant regarding CO_2 transportation in Florida and the capabilities of the nearest geologic storage (Sunniland Trend), the EPA has determined that CCS is technically infeasible as a control technology for this simple cycle project. Consequently, the EPA did not consider the economic analysis provided by the applicant in our BACT determination.

Step 3: Rank remaining control technologies

Based on the discussion in Steps 1 and 2, clean fuels and energy efficiency were considered technically feasible as control options. Further analysis of each of them is included in Step 4.

***Clean Fuels*:** The combustion of natural gas emits about 30% less CO_2 than oil.

***Energy Efficiency*:** The GE 7FA.05, LM6000, and LMS100 CTs were compared to each other. The applicant only considered those turbines that were at the same level of efficiency or higher than their proposed model GE 7FA.05. The top control is a combination of the cleanest fuel and the most energy efficient combustion turbine. In Step 4 the economic, energy, and environmental impacts of these technologies are analyzed.

Step 4: Economic, Energy, and Environmental Impacts

***Clean Fuels*:** The applicant considered two scenarios: (1) exclusively using 100% non-interruptible natural gas to run the CTs and (2) using natural gas as the primary gas along with ULSD fuel oil as the backup fuel. Per the EPA's request, the applicant submitted in the Response to the Notice of Incompleteness letter dated November 30, 2012, a BACT analysis including the consideration of 100% non-interruptible natural gas.

[9] Roberts-Ashby, T.; Stewart, M.; *Potential for carbon sequestration in the Lower Creataceous Sunniland Formation within the Sunniland Trend of the Sour Florida Basin, U.S.*, International Journal of Greenhouse Gas Control, 2012, pp 113-225.

100% Non-interruptible Natural Gas
The procurement of firm natural gas transportation for a peaking plant adds to the fixed operating costs. The nature of the SHGS project, where it is limited to operate no more than 3,390 hours per CT annually, makes the procurement of 100% non-interruptible natural gas for 8,760 hours per year incompatible with the Project. It increases the economic impacts of the Project. Current tariff rates for firm transportation are more than 2.5 times higher than interruptible transportation. The updated cost analysis including the 100% non-interruptible natural gas option shows this is not a feasible option due to the high cost when applied to the base scenario (construction of two SCCTs). The calculations show that the non-interruptible natural gas option is more expensive ($286.2 per ton of CO_2e removed) than the option with interruptible transportation of natural gas with ULSD fuel oil as backup fuel.

Since the EPA has determined that the use of 100% non-interruptible natural gas is not economically feasible, the use of natural gas as the primary fuel with ULSD fuel oil as back up is determined feasible for this project.

***Energy Efficiency*:** The applicant considered three different turbines (*i.e.*, LMS100, LM6000, and 7FA.05) before choosing the 7FA.05 as their final choice. As described in Table 6-1 below, LMS 100 and LM 6000 are more efficient than the GE 7FA.05. Based on the projected generation of 425 MW or more, the applicant would need a total of four LMS100 CTs, ten LM6000 CTs, or two 7FA.05 to produce the equivalent energy output.

When compared among each other, for the same output (425 MW), the LMS100 would emit about 108,130 TPY of CO_2e emissions less than the 7FA.05 and the LM6000, 72,576 TPY less than 7FA.05. Although LMS100 and LM6000 remain the top CTs when considering the CO_2e emissions, the environmental, energy, and economic impacts still need to be assessed.

Based on Attachment H of the application, consisting of the GHG BACT analysis for Puget Sound Energy Fredonia Generating Station Expansion Project, the heat rate at full load for each of the turbines are listed in the following table. The heat rate indicates the amount of energy required to produce a kilowatt-hour of electricity. Therefore, a lower heat rate number translates to a higher thermal efficiency of the turbine.

Table 6-1 Efficiency from Available Turbine Options[10]

	7FA.05	LM6000	LMS100
Manufacturer	GE	GE	GE
Technology	Aero	Aero	Frame
Heat rate @ Full Load (Btu/kWh, HHV) Natural Gas	8,848	9,226	9,910
Heat rate @ Full Load (Btu/kWh, HHV) ULSD oil	8,625	9,083	10,388
CO_2e emissions (TPY)	904,094	831,519	795,965
Rank (1=lowest emitting)	1	2	3

[10] Refer to Table 2 and 2a of the PSD GHG application dated September 2012 for additional details.

The LMS100 is a small aeroderivative simple cycle CT with the capability to produce 100 MW within 10 minutes.[11] The applicant would need to install a total of four LMS100s to produce around 400MW, which is close to the 425 MW they are proposing to produce. The LMS100 CT is suitable for use in a peaking power generation plant. It has a high base load (thermal) efficiency of 44%.

The LM6000 is a smaller aeroderivative simple cycle CT with the same quick start capability of the LMS100.[12] Since the CT is able to produce around 41 MW, the applicant would need to install around 10 LM6000 to produce approximately 416 MW. This SCCT is suitable for peaking power generation. It has a high base load (thermal) efficiency of 42%.

The GE 7FA.05 has a 38.5% thermal efficiency. The LMS 100 gas turbines have a maximum efficiency of 44% under ISO conditions.[13] The GE 7FA.05 ranked as the least efficient combustion turbine when compared to the LM6000 and LMS100 simple cycle combustion turbines. However, when the economic, energy, and environmental impacts are considered all together, the GE7FA.05 remained the most efficient control technology.

The applicant submitted an updated cost effectiveness analysis in the response to the notice of incompleteness determination dated November 30, 2012. Both scenarios, the base and the alternate, were considered. The EPA considered the capital and operational costs of the three SCCTs (7FA.05, LMS100 and LM6000). If analyzed according to the cost per ton of CO_2e removed, the cost for the ten LM6000 units would be $286.8 per ton of CO_2e removed more than the 7FA.05. For the four LMS100 the cost would be $61.9 per short ton of CO_2e more than the 7FA.05.

The water needs for two 7FA.05 SCCTs is expected to be around 165,000 gallons per day (GPD) on an annual average daily basis (firing natural gas and ULSD fuel oil as backup), the four LMS100s are expected to utilize 330,000 GPD on an annual average daily basis for NO_x emission control. The great amount of water consumption by the four LMS100 is a considerable environmental impact.

The LM6000 SCCT does not use water injection to control NO_x emissions; however, the amount of NO_x emissions (15 ppm) is higher than permitted. This particular SCCT generates additional NO_x, CO, and ammonia slip emissions. If either LMS100 or LM6000 was chosen as the SCCT for this facility, the applicant would need to install additional NO_x and CO control technologies. Although both the LMS100 and the LM6000 turbines are slightly more efficient than the GE 7FA.05, the environmental impacts they would have if constructed makes them infeasible.

Considering the higher costs for removing GHG emissions, the increased water usage, and the higher NO_x emissions, the EPA agrees that the most effective combination of control technologies is the use of model GE 7FA.05 combustion turbines operated using interruptible natural gas service and ULSD fuel oil as backup only.

Step 5: Selection of BACT

Shady Hills proposed gross output-based GHG BACT limits for "normal" operation of 1,377 lb CO_2e/MW-hr on a 12-month rolling average when using natural gas and a gross output-based GHG

[11] http://www.ge-energy.com/products_and_services/products/gas_turbines_aeroderivative/lms100.jsp, accessed May 2013.
[12] http://www.ge-energy.com/products_and_services/products/gas_turbines_aeroderivative/lm6000.jsp, accessed May 2013.
[13] Pio Pico Energy Center Fact Sheet and Ambient Air Quality Impact Report. June 2012.

BACT limit of 1,928 lb CO_2e/MW-hr on a 12-month rolling average when using ULSD fuel oil. The BACT limits are based on per turbine operation, ISO conditions[14], the range in operating loads, 2,890 hr/yr of natural gas operation, 1,000 hr/yr of ULSD oil operation, a 3 percent margin for the difference between guaranteed heat rates and actual heat rates, and a 5 percent margin for degradation over time.

The applicant also proposed GHG BACT limits for natural gas and ULSD oil during for startup and shutdown events. The proposed limits are based on the assumption that each startup and shutdown time is 15 minutes. Each year, an estimated 250-300 startups/shutdowns per CT are expected to occur.

Table 6-2 Proposed BACT for the SCCTs

Type of Fuel	Normal Operation (lb CO_2e/MW-hr)[a] per turbine	Startup and Shutdown (tons CO_2e /event)[b]
Natural gas	1,377	21
ULSD oil	1,928	28

a. Gross, 12-month rolling average; ISO conditions
b. Estimated startup and shutdown event would be 15 minutes long; 250-300 startup/shutdown events annually

Based on the BACT analysis, the proposed GHG BACT limits during normal operation conditions of 1,377 lb CO_2e/MW-hr (natural gas) and 1,928 lb CO_2e/MW-hr (ULSD fuel oil) on a 12-month rolling average is appropriate as BACT.

Based on the BACT analysis, the proposed GHG BACT limits during startup and conditions of 21 tons CO_2e per event (natural gas) and 28 tons CO_2e per event (ULSD fuel oil) per event (12-month rolling average) is appropriate as BACT.

6.2 GHG BACT Analysis for Smaller Combustion Equipment: Emergency Generator (EU 007) and Natural Gas Fuel Heater (EU 008)

CCS is not practical for control of CO_2 emissions from the emergency generators and natural gas fuel heater due to the small amount of CO_2 emissions potential from this equipment compared to the simple cycle system. Moreover, these units are not operated continuously or at their rated capacities making the addition of control equipment problematic. Therefore, CCS was not included as an available control technology in the following BACT analysis.

Step 1 & Step 2: Identify all available control technologies and eliminate technically infeasible control options

The applicant identified the following available control technologies in their permit application dated September 2012 for the proposed emergency generator and natural gas fuel heater.

***Clean Fuels*:** The applicant considered the possibility of operating a biodiesel- or natural gas-fired emergency generator. Biodiesel was eliminated as non-feasible due to its inherent properties. The biodiesel might affect the integrity of certain components such as rubber hoses and seals and may cause dissolvation and clogging due to sedimentation of dissolved components. Separation, congealing and degradation of the biodiesel are also a concern. The application also alluded to the limited amount of biodiesel emissions data for emergency generators as a disadvantage.

[14] ISO conditions = 59 deg. F, 60% humidity, 14.7 psia

On the other hand, natural gas-fired engines startup time is between 30 seconds to two minutes compared to 10 seconds startup for diesel fired engines. Cummins Power Generations[15] offer different fuel-fired emergency generators. The spark-ignited gas generators are available within a range of 5 kW to 150 kW. The lean-burn gas generators range from 315 kW to 2 MW in size. The diesel generators are available in sizes ranging from 10 kW to 2.5 MW, which includes the size of the proposed emergency generator. Caterpillar gas fueled standby generators range from 85 kW to 1040 kW[16] in size.

The applicant presented information demonstrating that a natural gas-fired generator with the rating needed for this project is not available. On the other hand, diesel generators with the required rating are readily available. The longer startup time of a natural gas-fired engines compared to that of a diesel-fired engines is also a decision factor.

Due to the disadvantages of biodiesel as a fuel and lack of availability of natural gas-fired generators with the proposed rating, these fuels are deemed technically infeasible for the proposed emergency generator. The EPA recognizes that, with the exception of the emergency generator, the other combustion equipment (Fuel Heater, EU 008) in this BACT analysis utilize natural gas as the only fuel source, which is a cleaner fuel with respect to GHG emissions and constitutes a lower polluting method of operation. For the fuel heater, the GHG emissions rate for natural gas firing is 116.9 lb CO_2e/MMBtu compared to 163.0 lb CO_2/MMBtu for ULSD fuel oil firing based on Subpart C of 40 CFR Part 98, Mandatory Greenhouse Gas Reporting Rule. The emission factors include N_2O and CH_4 at the equivalent rates. Therefore, firing natural gas will generate less GHG emissions than firing oil.

***Energy Efficiency*:** The natural gas heater may be used to warm up the natural gas flowing through the pipeline before feeding into the CTs. The heater supplies heat based on the natural gas conditions. Therefore, the amount of fuel used in the heater is regulated to that necessary for the natural gas delivered to the CT. The indirect-fired natural gas fuel heaters operate at a high thermal efficiency, usually greater than 75%.

The emergency generator is designed to meet the applicable NSPS and National Emission Standards for Hazardous Air Pollutants for non-road engines (subparts IIII and ZZZZ, respectively); thus, this unit will maximize efficiency while meeting the required emissions standards. In conjunction with maximizing efficiency, the applicant also proposed proper maintenance and operating procedures.

The applicant has proposed to limit the operation of the emergency generator to 100 hours per year, excluding emergencies, for routine testing and maintenance purposes in order to qualify as an emergency generator under the regulations cited above.

The natural gas fuel heater operation is limited by the maximum amount of hours the SCCTs are allowed to operate, 3,390 hours per year per CT, for a total of 6,780 hr/yr.

Energy efficiency, limitation of hours of operation and clean fuels (for non-emergency equipment) through the regulation of the amount of fuel used is considered to be the only technically feasible CO_2 control option for the emergency generator and natural gas heater.

[15] http://cumminspower.com/en/products/generators/
[16] *Cat Generator Set Specs*, http://www.cat.com/cda/layout?m=206981&x=7&f=448386

Step 3 & 4: Rank remaining control technologies and evaluation of impacts

Based on the discussion in Steps 1 and 2, the technically feasible control options for GHGs from the emergency generators and the natural gas fuel heater are energy efficiency through the regulation of fuel use of a cleaner fuel (for non-emergency equipment), and limitation of the operating hours. There are no anticipated adverse environmental impacts associated with the use of these controls as BACT.

Step 5: Select BACT

The emergency generator and the natural gas fuel heater together account for less than one percent of the total GHG emissions potential of the Project. The operation of these units will be regulated: emergency generator will follow work practice standards as their BACT and the natural gas fuel heater will be limited to operate for a maximum of 6,780 hours per year. Given the limited use of the emergency generator and the relatively small amount of GHG emissions, the EPA has determined that for the emergency generator work practice standards is more appropriate than a numeric BACT limit. Furthermore, the operation of this unit will be limited to 100 hours, excluding emergencies per 40 CFR 60 Subpart IIII and 40CFR 63 Subpart ZZZZ.

On the contrary, the EPA determined that for the natural gas fuel heater the proposed long-term BACT emission limit (in TPY on a 12-month rolling average) is more appropriate than a short-term emission limit. See Table 6-3 below for the proposed BACT. Compliance with these limits will be shown by following 40 CFR Part 98 methodologies, tracking the fuel consumption and hours of operation, as appropriate. Furthermore, to reduce the emissions and maintain consistency with the emission estimates in the permit application, the permit proposes to limit the use of these combustion units as described below.

Table 6-3 Proposed BACT for Smaller Combustion Equipment

Emission Unit	Proposed BACT	BACT Limit (TPY CO_2e)	Operating Limit
2.5 MW Emergency Generator (EU 007)	Selection of an energy efficient engine Limitation on hours of operation	Work Practice Standards	Non-BACT limitation: 100 hours per 12-month rolling total (40 CFR 63 Subpart ZZZZ)
Natural Gas Fuel Heater (EU 008)	Selection of an energy efficient heater Limitation of hours of operation Exclusive use of natural gas as fuel	3,965	6,780 hours per 12 month rolling average

6.3 GHG BACT Analysis for Circuit Breakers

Step 1: Identify all available control technologies

The applicant identified alternative (non-SF_6) dielectric fluids, minimization of SF_6, and good operational practices as the available control techniques in their permit application for the proposed circuit breakers. Historically, dielectric fluids such as dielectric oils have been used in high voltage applications. However, the use of these materials in circuit breakers has been predominantly replaced

with SF_6, which has superior dielectric and arc quenching properties. Modern SF_6 circuit breakers are designed as totally enclosed pressure systems with low potential SF_6 fugitive emissions. The proposed circuit breaker will have a pressure gage with internal set points for operation limitations. Leakage is typically guaranteed to be no more than 0.5% by weight. In addition, circuit breakers have density alarms that provide warnings when a leak occurs. Further, this equipment is routinely inspected to insure proper operation since the equipment is necessary for safe operation of the Project.

Step 2: Eliminate technically infeasible control options

Circuit breakers using SF_6 with alarms and periodic inspection are technically feasible for the Project. The use of alternative dielectric fluids is not practical for high voltage applications. Circuit breakers using SF_6 insulating gas are presently superior in their performance to alternative systems using dielectric oil, high pressure air blast, or vacuum circuit breakers.

Step 3 & 4: Rank remaining control technologies and evaluation of impacts

Based on the discussion in Steps 1 and 2, the only technically feasible control option for SF_6 emissions from circuit breakers is the use of modern enclosed systems with alarms and periodic inspection. There are no anticipated adverse environmental impacts associated with the use of modern enclosed circuit breaker systems with alarms and periodic inspection.

Step 5: Select BACT

The most effective control of fugitive SF_6 emissions is using three totally enclosed systems equipped with leak detection along with good operational practices such as:

- Pressure gages with internal set points for operation limitations,
- Repair of leaks or replacement of equipment, and
- Continuous monitoring of circuit breaker pressure gage, periodic inspection, and maintenance.

Since emissions of GHGs from the circuit breakers ideally should be zero in the absence of leakage, the EPA has also proposed BACT to be work practice standards to minimize leakage. This includes the use of the proposed leak detection and periodic inspection and maintenance practices.

6.4 GHG BACT Analysis for GHG Fugitive Emissions from On-Site Pipeline

Step 1: Identify all available control technologies

The applicant did not identify any control technologies for fugitive GHG emissions related to leaks from on-site pipeline and natural gas supply. Nonetheless, the only feasible control technology for such emissions would be:

1. Minimize Leaks

Step 2: Eliminate technically infeasible control options

There are no technically infeasible control technologies to be eliminated.

Step 3 & 4: Rank remaining control technologies and evaluation of impacts

Based on the discussions in Steps 1 and 2, the only technically feasible control option is to minimize natural gas leaks from piping components.

Step 5: Select BACT

The EPA agrees with the proposed BACT to minimize GHG fugitive emissions from on-site pipeline and natural gas supply through monitoring and repairing. The applicant will continuously monitor pipeline system pressure against alarm set points to identify leaks. Additionally, natural gas will be treated with mercaptan for human detection of any odor from leaks.

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7.0 Additional Requirements

7.1 Endangered Species Act

Section 7(a)(2) of the Endangered Species Act (ESA) requires federal agencies, in consultation with the National Oceanic and Atmospheric Administration (NOAA) National Marine Fisheries Service (NMFS) and/or the U.S. Fish and Wildlife Service (FWS) (collectively, "the Services"), to ensure that any action authorized, funded, or carried out by the agency is not likely to jeopardize the continued existence of a species listed as threatened or endangered, or result in the destruction or adverse modification of designated critical habitat of such species. *See* 16 U.S.C. §1536(a)(2); *see also* 50 CFR §§ 402.13 and 402.14. The federal agency is also required to confer with the Services on any action which is likely to jeopardize the continued existence of a species proposed for listing as threatened or endangered or which will result in the destruction or adverse modification of critical habitat proposed to be designated for such species. *See* 16 U.S.C. §1536(a)(4); *see also* 50 CFR 402.10. Further, the ESA regulations provide that where more than one federal agency is involved in an action, the consultation requirements may be fulfilled by a designated lead agency on behalf of itself and the other involved agencies. *See* 50 CFR § 402.07.

On December 3, 2012, NOAA's NMFS Southeast Region, Habitat Conservation Division determined in an email response sent to the applicant, resources affected by the project for which the NMFS is responsible.

Based upon the best available data and informal consultation with the Services, the EPA determined that the issuance of this permit to Shady Hills is not likely to cause any adverse effects on listed species and essential fish habitats. The applicant will enforce standard protection measures during construction to ensure one of the potentially identified endangered species is not harmed. The proposed permit includes a condition requiring Shady Hills to comply with all other applicable federal regulations. The EPA received concurrence on November 27, 2012, from the Fish and Wildlife Service that the proposed project is not likely to adversely affect resources protected by the Endangered Species Act of 1973, as amended (16 U.S.C. 1531). The FWS confirmed the ESA consultation requirements were met.

7.2 Essential Fish Habitat of Magnuson-Stevens Act

Section 305(b)(2) of the Magnuson-Stevens Fishery Conservation and Management Act (MS**FC**A) requires federal agencies to consult with NOAA with respect to any action authorized, funded, or undertaken by the agency that may adversely affect any essential fish habitat identified under the MSA. The EPA is the lead agency for ESA Section 7 and MSA compliance for the Project and is currently in consultation with NOAA regarding both Acts (*see* ESA discussion above).

On August 2, 2013, the U.S. Department of Commerce, National Marine Fisheries Service (NMFS) confirmed, in an email, the EPA's assessment that due to the location of the Shady Hills site, the Project will not likely affect any essential fish habitat according to the MSFCA.

7.3 National Historic Preservation Act

Section 106 of the National Historic Preservation Act requires federal agencies to take into account the effects of their undertakings on historic properties. Section 106 requires the lead agency official to

ensure that any federally funded, permitted, or licensed undertaking will have no effect on historic properties that are on or may be eligible for the National Register of Historic Places.

A desktop cultural resource analysis was submitted to the Florida Division of Historical Resources (DHS) by Golder Associates, Inc through a letter dated August 17, 2012. The Shady Hills property is approximately 30 acres, with the proposed generators and switchyard to be located east of the existing infrastructure. The area had been previously used as a construction laydown area. The survey included a review of information from the Florida Master Site File (FMSF). The survey determined that there are no previously recorded archaeological sites or historic standing structures within the Shady Hills Generating Station property.

In a response letter dated September 20, 2012, the Florida DHS indicated that due to environmental conditions consistent with those found at other archaeological sites in Pasco Country and lack of professional archeological or historical investigation, there is some potential for undiscovered sites to occur. The DHR requested a special condition if historical or archaeological artifacts are discovered during construction, the EPA and FDEP will be notified and proper procedures will be followed.

7.4 Coastal Zone Management Act

According to the Coastal Zone Management Act of 1972 (CZMA), the State may develop and adopt a management program for its coastal zone in accordance with Federal rules and regulations promulgated by the Secretary, after notice, and with the opportunity of full participation by relevant Federal agencies, State agencies, local governments, regional organizations, port authorities, and other interested parties and individuals, public and private, which is adequate to carry out the purposes of the CZMA and is consistent with the policy declared in the CZMA.

The Florida Coastal Management Act (§380.205-380.27, Florida Statutes) requires that the Coastal Zone Management Section of FDEP be responsible for certification of consistency with the Florida Coastal Management Program (FCMP) for all Federal licenses, permits, activities, and projects listed in §380.23(3)(c), Florida Statutes, when such activities are subject to Federal consistency review and affect land or water use, are seaward of the jurisdiction of the state, or there is no State agency with sole jurisdiction for such consistency review. The issuance of Federal permits listed in §380.23(3)(c), Florida Statutes is not required.

NOAA's NMFS, Southeast Region, Habitat Conservation Division determined in an email response sent to the applicant on December 3, 2012, that the resources affected by the project are not ones for which the NMFS is responsible since this type of Project is not included in the §380.23(3)(c), Florida Statutes.

7.5 Executive Order 12898 - Environmental Justice

Executive Order (EO) 12898 (59 FR 7629 (Feb. 16, 1994)) establishes federal executive branch policy on environmental justice. Based on this Executive Order, the EPA's Environmental Appeals Board (EAB) has held that environmental justice issues must be considered in connection with the issuance of federal Prevention of Significant Deterioration (PSD) permits issued by the EPA Regional Offices [See, e.g., *In re Prairie State Generating Company*, 13 E.A.D. 1, 123 (EAB 2006); *In re Knauf Fiber Glass,* Gmbh, 8 E.A.D. 121, 174-75 (EAB 1999)]. This permitting action, if finalized, authorizes emissions of GHG, controlled by what we have determined is the Best Available Control Technology for those emissions. It does not select environmental controls for any other pollutants. Unlike the criteria pollutants for which the EPA has historically issued PSD permits, there is no National Ambient Air

Quality Standard (NAAQS) for GHG. The global climate-change inducing effects of GHG emissions, according to the "Endangerment and Cause or Contribute Finding", are far-reaching and multi-dimensional (75 FR 66497). Climate change modeling and evaluations of risks and impacts are typically conducted for changes in emissions that are orders of magnitude larger than the emissions from individual projects that might be analyzed in PSD permit reviews. Quantifying the exact impacts attributable to a specific GHG source obtaining a permit in specific places and points would not be possible [PSD and Title V Permitting Guidance for GHGs at 48]. Thus, we conclude it would not be meaningful to evaluate impacts of GHG emissions on a local community in the context of a single permit. Accordingly, we have determined an environmental justice analysis is not necessary for the permitting record.

7.6 Executive Order 13175 – Tribal Consultation

In accordance with Executive Order 13175 and the EPA Policy on Consultation and Coordination with Indian Tribes, the Miccosukee Tribe of Indians of Florida (Miccosukee Tribe) and the Seminole Tribe of Florida (Seminole Tribe) were offered the opportunity to consult regarding the EPA's consideration of the PSD permit application submitted by Shady Hills. Neither tribe responded to the EPA invitation for consultation sent on November 30, 2012, about the SHGS permit action. The EPA sent a letter confirming their lack of response on January 23, 2013. Both tribes were informed that regardless of whether they elected to consult on the permit application, they would also have the opportunity to submit comments during any forthcoming public comment period.

The objective of such consultation, in the EPA's view, is to improve the EPA's understanding of the perspectives of the Seminole Tribe and Miccosukee Tribe and to identify any issues or concerns they may have regarding the EPA's consideration of Shady Hills's application. During the course of any consultation on this matter, the EPA can offer such things as education and outreach, holding conference call(s) to discuss issues and concerns, and providing feedback through written communication explaining how the EPA considered any issues and concerns raised.

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8.0 Public Participation

8.1 Opportunity for Public Comment

These proceedings are subject to the EPA's *Procedures for Decisionmaking*, set forth at 40 CFR Part 124. As provided in Part 124, EPA is seeking public comment on the Project draft air permit (PSD-EPA-R4013) during the public comment period as specified in the public notice.

Any interested person may submit written comments on the draft permit during the public comment period. If you believe that any condition of the permit is inappropriate, you must raise all reasonably ascertainable issues and submit all reasonably available arguments supporting your position by the end of the comment period. Any documents supporting your comments must be included in full and may not be incorporated by reference unless they are already part of the record for this permit or consist of state or federal statutes or regulations, EPA documents of general applicability, or other generally available referenced materials.

Comments should focus on the proposed air quality permit and the GHG permit terms. Comments related to the other criteria pollutants and the preconstruction permitting under the jurisdiction of the State of Florida are outside the scope of this action. All timely comments will be considered in making the final decision, included in the record, and responded to by the EPA. The EPA may summarize the comments and group similar comments together in our response, and will not respond to individual commenters directly.

All comments on the draft permit must be received by e-mail at R4GHGPermits@epa.gov, submitted electronically via www.regulations.gov (docket number EPA-R04-OAR-2013-0647), or postmarked by October 24, 2013. Comments sent by mail should be addressed to: USEPA Region 4, Air Permits Section, APTMD; 61 Forsyth Street, SW; Atlanta, GA 30303. An extension of the 30-day comment period may be granted if the request for an extension adequately demonstrates why additional time is required to prepare comments. Comments must be sent or delivered in writing to the address below. All comments will be included in the public docket without change and may be made available to the public, including any personal information provided, unless the comment includes Confidential Business Information or other information in which disclosure is restricted by statute. Information that you consider Confidential Business Information or otherwise protected should be clearly identified as such and should not be submitted through e-mail. If you send e-mail directly to the EPA, your email address will be captured automatically and included as part of the public comment. Please note that an e-mail or postal address must be provided with your comments if you wish to receive direct notification of the EPA's final decision regarding the permit and the EPA's response to comments submitted during the public comment period.

For general questions on the draft permit, please contact: Mrs. Ana M. Oquendo at 404-562-9781 or oquendo.ana@epa.gov.

8.2 Public Hearing

The EPA will hold a public hearing if the Agency determines there is a significant degree of public interest in the draft permit. Public hearing requests must be in writing and received by the EPA by email or mail by October 8, 2013. Requests should be sent by e-mail to R4GHGPermits@epa.gov or by mail addressed to: USEPA Region 4, Air Permits Section, APTMD; 61 Forsyth Street, SW; Atlanta, GA 30303. Requests for a public hearing must state the nature of the issues proposed to be raised in the

hearing. If a public hearing is held, you may submit oral and/or written comments on the draft permit at the public hearing. You do not need to attend the public hearing to submit written comments. If the EPA determines there is a significant degree of public interest, the EPA will hold a public hearing on the draft PSD permit on October 24, 2013, at the location given in the public notice. If a public hearing is held, the public comment period will automatically be extended to the close of the public hearing. If no timely request for a public hearing is received, or the EPA determines that there is not a significant degree of public interest, *the hearing will be cancelled.* An announcement of cancellation will be posted on the EPA's website at: http://www.epa.gov/region4/air/permits/ghgpermits/ghgpermits.html, or you may call the EPA at the contact number above to determine if the public hearing will be held.

8.3 Administrative Record

The administrative record contains the application, supplemental information submitted by Shady Hills, and correspondence, including e-mails, between Shady Hills and its consultants and the EPA clarifying various aspects of Shady Hills application. The draft permit and the administrative record are available for public review at the EPA Region 4 office and the Regency Park Library at the addresses listed below. Please call in advance for available viewing times.

Regency Park Library
9701 Little Road
Port Richey, FL 34654
(727) 861-3049

EPA Region 4 Office
61 Forsyth Street, SW
Atlanta, GA 30303
Phone: (404) 562-9781

The administrative record and draft permit are also available on the EPA's website at: http://www.epa.gov/region4/air/permits/ghgpermits/ghgpermits.html.

To request a copy of the draft permit, preliminary determination or notice of the final permit action, please contact: Ms. Rosa Yarbrough, Permit Support Specialist at: 404-562-9643, or R4GHGpermits@epa.gov.

8.4 Final Determination

A decision to issue a final permit, or to deny the application for the permit, shall be made after all timely comments have been considered. Notice of the final decision shall be sent to each person who has submitted written comments or requested notice of the final permit decision, provided the EPA has adequate contact information.