TECHNICAL EVALUATION
&
PRELIMINARY DETERMINATION

APPLICANT

Brevard Energy, LLC
29261 Wall Street
Wixom, Michigan 48393

Brevard County Solid Waste Management Central Disposal
Facility ID No. 0090069

PROJECT

Project No. 0090069-009AC / PSD-FL-378C
Draft Air Construction Permit Modification
Revision for CO/PM_{10} Limits on the Landfill Gas Engines

COUNTY

Brevard County, Florida

PERMITTING AUTHORITY

Florida Department of Environmental Protection
Division of Air Resource Management
Bureau of Air Regulation
Permitting and Compliance Section
2600 Blair Stone Road, MS#5505
Tallahassee, Florida 32399-2400

June 20, 2011

1. GENERAL PROJECT INFORMATION

Air Pollution Regulations

Projects at stationary sources with the potential to emit air pollution are subject to the applicable environmental laws specified in Section 403 of the Florida Statutes (F.S.). The statutes authorize the Department of Environmental Protection (Department) to establish regulations regarding air quality as part of the Florida Administrative Code (F.A.C.), which includes the following applicable chapters: 62-4 (Permits); 62-204 (Air Pollution Control – General Provisions); 62-210 (Stationary Sources – General Requirements); 62-212 (Stationary Sources – Preconstruction Review, including determinations of Best Available Control Technology (BACT)); 62-213 (Operation Permits for Major Sources of Air Pollution); 62-296 (Stationary Sources - Emission Standards); and 62-297 (Stationary Sources – Emissions Monitoring). Specifically, air construction permits are required pursuant to Rules 62-4, 62-210 and 62-212, F.A.C.

In addition, the U. S. Environmental Protection Agency (EPA) establishes air quality regulations in Title 40 of the Code of Federal Regulations (CFR). Part 60 specifies New Source Performance Standards (NSPS) for numerous industrial categories. Part 61 specifies National Emission Standards for Hazardous Air Pollutants (NESHAP) based on specific pollutants. Part 63 specifies NESHAP based on the Maximum Achievable Control Technology (MACT) for numerous industrial categories. The Department adopts these federal regulations on a quarterly basis in Rule 62-204.800, F.A.C.

Glossary of Common Terms

Because of the technical nature of the project, the permit contains numerous acronyms and abbreviations, which are defined in Appendix A of this permit.

Facility Description and Location

The Brevard County Solid Waste Management Central Disposal Facility (Central Disposal Facility) operates a Class I municipal solid waste (MSW) landfill in Cocoa, Brevard County. The Brevard County Solid Waste Management Central Disposal Facility is located at 2250 Adamson Road, Cocoa, Brevard County. The facility's universal transverse mercator (UTM) system coordinates are Zone 17; 516.75 kilometer (km) East; 3140.57 km North.

Landfill gas (LFG) is a product of the microbial decomposition of waste and is extracted by recovery wells that are located in both active and capped cells of the landfill. Brevard Energy operates an electrical generation plant that consists of six Caterpillar Model G3520C internal combustion engines and electrical generators that are fueled exclusively by LFG. Each engine has an energy output of 2,233 brake horsepower at 100% load and generates 1,600 kilowatt of power. The LFG recovered from the landfill well points is filtered, compressed and dewatered. After pretreatment, LFG is transferred through the collection system by the gas blower/compressor to the LFG engines for combustion. When the engines are off line for maintenance or the wells are providing LFG in excess of the capacity of the engines, residual LFG is diverted to the existing flare system for oxidization.

Facility Regulatory Categories

- The facility is not a major source of hazardous air pollutants (HAP).
- The facility does not operate units subject to the acid rain provisions of the Clean Air Act (CAA).
- The facility is a Title V major source of air pollution in accordance with Chapter 213, F.A.C.
- The facility is an existing major stationary source in accordance with Rule 62-212.400, F.A.C. for the Prevention of Significant Deterioration (PSD) of Air Quality.
- The facility operates units subject to the following applicable New Source Performance Standards (NSPS) in Title 40, Part 60 of the Code of Federal Regulations (40 CFR 60): Subpart A (General Provisions), and Subpart WWW (MSW Landfills).

- The facility operates units subject to the following applicable National Emissions Standards for Hazardous Air Pollutants (NESHAP) in Title 40, Part 63 of the Code of Federal Regulations (40 CFR 63): Subpart A (General Provisions), Subpart AAAA (MSW Landfills) and Subpart ZZZZ (Reciprocating Internal Combustion Engines).

Project Description

The applicant requests a revision of the BACT emissions limits maximum allowable carbon monoxide (CO) and particulate matter with an aerodynamic diameter of less than 10 micrometers (PM_{10}) emissions rate. Based on experience with operating LFG-to-energy systems, the applicant proposes the following revisions:

- CO emission factor from 2.75 grams per brake horsepower hour (g/bhp-hr) CO to 3.3 g/bhp-hr.
- PM_{10} emission factor from 0.24 g/bhp-hr to 0.29 g/bhp-hr.

Although the request will revise the original BACT determinations, it is not expected to result in an actual increase in emissions. The applicant requested a concurrent revision of the Title V air operation permit along with a revision to the original PSD air construction permit.

Processing Schedule

- November 15, 2010 Application received.
- December 27, 2010 Additional information requested.
- March 28, 2011 Additional information received.

2. PSD APPLICABILITY

The existing facility is an existing major stationary source. Construction of the LFG-to-energy plant was in accordance with original Permit No. PSD-FL-378. The proposed project requires a review of the original BACT determinations as well as an air quality modeling analysis for CO and PM_{10} emissions.

3. DEPARTMENT REVIEW

Carbon Monoxide

Emissions data from Caterpillar indicates a not to exceed (NTE) CO emissions limit of 4.13 g/bhp-hr. Annual compliance tests conducted at the facility over the past three years report CO emission ranging between 2.23 and 2.40 g/bhp-hr. While these CO compliance test results are significantly less than the manufacturers NTE limit, variability in the LFG fuel methane content and engine maintenance cycles will have a significant impact on projected emissions in the future.

The original CO BACT determination was based on the engine design and good combustion practices (including maintenance). The Department is unaware of any new control equipment that would be cost effective. The LFG contains siloxanes, which are silica compounds that form glass-like deposits on the pistons, cylinders, valves, intake manifold and exhaust manifolds of the engine. These deposits degrade the performance of the engine and extensive maintenance is required to restore the combustion equipment to proper operation. As the engine performance degrades, it is difficult to maintain the engine tuned for low CO and NOx emissions.

In support of this concept, the Department found a recent white paper report by the Bay Area Air Quality Management District (BAAQMD) titled, "Revisiting BACT for Lean-Burn Landfill Gas Fired Internal Combustion Engines" from February of 2009. The study discovered that the variability in engine combustion efficiency was not being accounted for since, "… *CO deterioration during the year is not typically detected nor limited*". Existing BACT emissions limits "achieved in practice" were based on once per year compliance tests. Such tests do not account for variability of emissions due to degraded engine performance resulting from siloxane deposits on combustion surfaces. In addition, existing BACT limits were "… *established based on early, limited source test data for digester gas fired engines* …" and as such, are not appropriate for LFG combustion engines.

Wastewater digestor gas has higher methane content than LFG meaning that it also has a higher amount of energy per unit volume. The BAAQMD concluded that "… *Our discussions with waste gas engine operators leads us to believe that engines generally perform at their best after overhaul events and that combustion performance tends to deteriorate as siloxane deposits form throughout the combustion surfaces."* The white paper concluded "… *it is apparent that:*

1. *it is normal for CO emissions to increase as the engines are operated, and*
2. *establishment of not to exceed limits based on a nominal rate of CO increase would seem to be a reasonable approach for these engines, and*
3. *additional monitoring is needed to ensure that the engines get needed maintenance in a timely fashion.*

Engine maintenance events may not have a significant impact on NOx emissions, but for landfill gas engines, regular maintenance is of paramount importance for minimizing CO emissions." The BAAQMD recommends a NTE emissions limit of 3.6 g/bhp-hr for low-CO biased engines.

The Department also agrees that additional flexibility with CO emissions is necessary to concurrently maintain and tune the engines for low NOx emissions. Therefore, the current CO BACT emission standards for each engine/generator set will be revised as follows:

- From 2.75 to 3.5 g/bhp-hr;
- From 13.54 to 17.2 lb/hour; and
- From 59.3 to 75.3 tons/year.

Particulate Matter

On occasion, the Department relies on the firing of clean fuels as BACT for PM_{10} emissions (e.g., combustion turbines). Since LFG is not considered a "clean fuel", the original project based the PM_{10} BACT determination on treating the LFG prior to combustion, which required a pretreatment system including: LFG compression (via blowers), liquids removal (via knock-out and chilling) and particle removal (via 1 micron primary and polishing filters). The Department notes that the new NSPS provisions in 40 CFR 60 for compression ignition engines (Subpart IIII) and for spark ignition engines (Subpart JJJJ) do not regulate particulate matter emissions. As specified in the NSPS Standards of Performance, Emission Guidelines and National Emission Standards for Hazardous Air Pollutants for Municipal Solid Waste Landfills:

> *"Landfills NSPS for filtration and de-watering, the refined proposed definitions contain specific numerical values that would provide long-term protection of the combustion equipment, which would support good combustion. For particulate matter filtration, a filter system would be required to have an absolute rating no greater than 10 microns. For dewatering, the system would be required to reduce the dew point by at least 20 degrees Fahrenheit."*

The BAAQMD posted a June 17, 1999 internal memo titled "BACT Guideline for the Vasco Road Sanitary Landfill's Proposed Gas Turbine (Application #19620, Plant #5095)". This memo references another BACT determination by the South Coast Air Quality Management District (SCAQMD), which states:

> ***"BACT for PM_{10}:***
>
> *Only the SCAQMD has established BACT guidelines for landfill gas turbines. The SCAQMD BACT guideline specifies that, for landfill gas-fired turbines, fuel gas pretreatment for particulate removal have been "achieved in practice". Therefore, in the absence of any other BACT determinations, fuel gas pretreatment for particulate removal constitutes BACT for landfill gas-fired turbines."*

Previous BACT determinations for particulate matter range from 0.039 to 1.52 g/bhp-hr. Florida's most recent draft BACT determination for a similar landfill gas engine (Waste Management, Inc. of Florida, Medley Landfill,

Project No. 0250615-012-AC/ PSD-FL-414) was fuel pretreatment and good combustion practices resulting in an equivalent PM_{10} emission rate of 0.24 g/bhp-hr. Although initial stack tests for particulate matter emissions from new landfill gas engines have been very low (< 0.1 g/bhp-hr), subsequent tests on the same equipment tend to show higher emission levels with increased engine operating hours. Based on operating experience, Caterpillar, confirms an increase in particulate matter resulting from normal wear and tear on piston rings and seals. Therefore, the Department establishes the following work practice standards as the preliminary revised BACT determination for particulate matter from the engines:

- The permittee shall install, operate and maintain a landfill gas pretreatment system to dewater, compress and filter (1 micron and greater) the landfill gas prior to combustion in the engines.
- The permittee shall implement the following good combustion practices to minimize particulate matter emissions: lean-burn combustion design, efficient combustion through the air-fuel controller and preventive and periodic maintenance in accordance with any applicable requirements in NESHAP Subpart ZZZZ or 40 CFR 63.
- As determined by EPA Method 9, visible emissions from the landfill gas engines shall not exceed 10% opacity.

The above work practice standards should maintain PM_{10} emission rates at 0.24 g/bhp-hr or less.

Discussion of particulate matter with an aerodynamic diameter of less than 2.5 micrometers ($PM_{2.5}$) Emissions

The Department adopted by reference the federal ambient air quality standard for $PM_{2.5}$, but has not yet promulgated the implementing regulations for PSD preconstruction review (e.g., define $PM_{2.5}$ as a PSD pollutant with a significant emission rate for PSD applicability). The Department is in the process of completing a rulemaking action to implement this remaining piece of the $PM_{2.5}$ program. The draft permit revision and current permit include the following requirements, which address $PM_{2.5}$ emissions:

- Use of LFG as the only fuel;
- Requirement to pre-treat the LFG with filtration down to 1 micron prior to combustion;
- Sampling, analysis and reporting requirements to ensure that the project remains minor with respect to SO_2 emissions, which is a precursor of $PM_{2.5}$ emissions; and
- A NOx standard of 0.6 g/bhp-hour (another precursor of $PM_{2.5}$ emissions), which is 80% below the applicable 2008 NSPS Subpart JJJJ limitation of 3.0 g/bhp-hour.

The Department believes that these techniques and limitations effectively minimize $PM_{2.5}$ emissions.

4. AIR QUALITY IMPACT ANALYSIS

This section provides a general overview of the modeling analyses required for PSD preconstruction review followed by the specific analyses required for this project.

Overview of the Required Modeling Analyses

Pursuant to Rule 62-212.400, F.A.C., the applicant is required to conduct the following analyses for each PSD significant pollutant:

- A preconstruction ambient air quality analysis,
- A source impact analysis based on EPA-approved models, and
- An additional impact analyses.

Preconstruction Ambient Monitoring Analysis

Generally, the first step is to determine whether the Department will require preconstruction ambient air quality monitoring. Using an EPA-approved air quality model, the applicant must determine the predicted maximum ambient concentrations and compare the results with regulatory thresholds for preconstruction ambient monitoring, known as de minimis air quality levels. The regulations establish de minimis air quality levels for several PSD pollutants as shown in the following table. For ozone, there is no de minimis air quality level because it is not emitted directly. However, since nitrogen dioxide (NO_2) and volatile organic compounds (VOC) are considered precursors for ozone formation, the applicant may be required to perform an ambient impact analysis (including the gathering of ambient air quality data) for any net increase of 100 tons per year or more of nitrogen dioxide NO_2 or volatile organic compounds VOC emissions. Included in the PSD pollutants with de minimis air quality levels are; fluorides (Fl), hydrogen sulfide (H_2S), lead (Pb), mercury (Hg), reduced sulfur compounds (RSC), sulfur dioxide (SO_2), and total reduced sulfur (TRS).

If the predicted maximum ambient concentration is less than the corresponding de minimis air quality level, Rule 62-212.400(3)(e), F.A.C. exempts that pollutant from the preconstruction ambient monitoring analysis. If the predicted maximum ambient concentration is more than the corresponding de minimis air quality level (except for non-methane hydrocarbons), the applicant must provide an analysis of representative ambient air concentrations (pre-construction monitoring data) in the area of the project based on continuous air quality monitoring data for each such pollutant with an Ambient Air Quality Standard (AAQS). If no such standard exists, the analysis shall contain such air quality monitoring data as the Department determines is necessary to assess ambient air quality for that pollutant.

PSD Pollutant	De Minimis Air Quality Levels
CO	575 μg/m3, 8-hour average
NO_2	14 μg/m3, annual average;
PM_{10}	10 μg/m3, 24-hour average
SO_2	13 μg/m3, 24-hour average
Pb	0.1 μg/m3, 3-month average
Fl	0.25 μg/m3, 24-hour average
TRS	10 μg/m3, 1-hour average
H_2S	0.2 μg/m3, 1-hour average
RSC	10 μg/m3, 1-hour average
Hg	0.25 μg/m3, 24-hour average

If preconstruction monitoring data is necessary, the Department may require the applicant to collect representative ambient monitoring data in specified locations prior to commencing construction on the project. Alternatively, the Department may allow the requirement for preconstruction monitoring data to be satisfied with data collected from the Department's extensive ambient monitoring network. Preconstruction monitoring data must meet the requirements of Appendix B to 40 CFR 58 during the operation of the monitoring stations. The preconstruction monitoring data will be used to determine the appropriate ambient background concentrations to support any required AAQS analysis.

Finally, after completing the project, the Department may require the applicant to conduct post-construction ambient monitoring to evaluate actual impacts from the project on air quality.

Source Impact Analysis

For each PSD-significant pollutant identified above, the applicant is required to conduct a source impact analysis for affected PSD Class I and Class II areas. This analysis is to determine if emissions from this project will significantly impact levels established for Class I and II areas. Class I areas include protected federal parks and national wilderness areas (NWA) that are under the protection of federal land managers. The table identifies the Class I areas located in Florida or that are within

Class I Area	State	Federal Land Manger
Bradwell Bay NWA	Florida	U.S. Forest Service
Chassahowitzka NWA	Florida	U.S. Fish and Wildlife Service
Everglades National Park	Florida	National Park Service
Okefenokee NWA	Georgia	U.S. Fish and Wildlife Service
St. Marks NWA	Florida	U.S. Fish and Wildlife Service
Wolf Island NWA	Georgia	U.S. Fish and Wildlife Service

200 kilometers in nearby states. Class II areas represent all other areas in the vicinity of the facility open to public access that are not Class I areas.

The Department is in the process of adopting Significant Emission Rates (SER), Significant Impact Levels (SIL) and AAQS for particulate matter with an aerodynamic diameter of less than 2.5 micrometers ($PM_{2.5}$). The Department extended the applicant's $PM_{2.5}$ results with respect to the federal maximum 24-hour and annual impacts as discussed further below. In conducting this analysis, the applicant conservatively assumed that all PM_{10} is actually $PM_{2.5}$. In addition, the Department scaled the SIL for PM_{10} in proportion to the ratio of the respective national AAQS to develop SIL applicable to $PM_{2.5}$. The rationale for the SIL used for $PM_{2.5}$ is as follows:

- The promulgated annual SIL for PM_{10} is 2% of the corresponding state/national AAQS;
- The project-specific annual SIL for $PM_{2.5}$ is also 2% of the corresponding AAQS;
- The promulgated 24-hour SIL for PM_{10} is 3.3% of the state/national AAQS; and
- The project-specific SIL for $PM_{2.5}$ is also 3.3% of the AAQS.

The Department believes this approach encompasses all meaningful $PM_{2.5}$ sources capable of interacting with the project for the purposes of determining impacts with respect to the 24-hour and annual AAQS for $PM_{2.5}$.

An initial significant impact analysis is conducted using the worst-case emissions scenario for each pollutant and corresponding averaging time. The regulations define separate significant impact levels for Class I and Class II areas for CO, NO_2, Pb, PM_{10}, and SO_2. Based on the initial significant impact analysis, no additional modeling is required for any pollutant with a predicted ambient concentration less than the corresponding significant impact level. However, for any pollutant with a predicted ambient concentration exceeding the corresponding significant impact level, the applicant must conduct a full impact analysis. In addition to evaluating impacts caused by the project, a full impact modeling analysis also includes impacts from other nearby major sources (and any potentially-impacting minor sources within the radius of significant impact) as well to determine compliance with:

- The PSD increments and the federal air quality related values (AQRV) for Class I areas.
- The PSD increments and the AAQS for Class II areas.

As previously mentioned, for any net increase of 100 tons per year or more of VOC or NO_2 subject to PSD, the applicant may be required to perform an ambient impact analysis for ozone including the gathering of ambient ozone data.

PSD Class I and II Area Model

The EPA-approved American Meteorological Society and EPA Regulatory Model (AERMOD) dispersion model is used to evaluate short range impacts from the proposed project and other existing major sources. In November of 2005, the EPA promulgated AERMOD as the preferred regulatory model for predicting pollutant concentrations within 50 kilometers of a source. The AERMOD model is a replacement for the Industrial Source Complex Short-Term model (ISCST3). The AERMOD model calculates hourly concentrations based on hourly meteorological data. The model can predict pollutant concentrations for annual, 24-hour, 8-hour, 3-hour and 1-hour averaging periods. In addition to the PSD Class II modeling, it is also used to model the predicted impacts for comparison with the de minimis ambient air quality levels when determining preconstruction monitoring requirements.

For evaluating plume behavior within the building wake of structures, the AERMOD model incorporates the Plume Rise Enhancement (PRIME) downwash algorithm developed by the Electric Power Research Institute (EPRI). A series of specific model features recommended by the EPA are referred to as the regulatory options. The applicant used the EPA-recommended regulatory options in each modeling scenario and building downwash effects were evaluated for stacks below the good engineering practice (GEP) stack heights.

Meteorological data used in the AERMOD model consisted of a concurrent five-year period of hourly surface weather observations from the National Weather Service office located at Orlando International Airport and twice-daily upper air soundings from Tampa International Airport. The five-year period of meteorological data was from 1999 through 2003. These stations were selected for use in the evaluation because they are the closest primary weather stations to the project area and are most representative of the project site.

Stack Height Considerations

GEP stack height means the greater of 65 meters (213 feet) or the maximum nearby building height plus 1.5 times the building height or width, whichever is less. Where the affected stacks did not meet the requirements for GEP stack height, building downwash was considered in the modeling analyses. Based on a review of this application, the Department determines that the project complies with the applicable provisions of the stack height regulations as revised by EPA on July 8, 1985 (50 FR 27892). Portions of the regulations have been remanded by a panel of the U.S. Court of Appeals for the D.C. Circuit in NRDC v. Thomas, 838 F. 2d 1224 (D.C. Cir. 1988). Consequently, this permit may be subject to modification if and when EPA revises the regulation in response to the court decision. This may result in revised emission limitations or may affect other actions taken by the source owners or operators.

Additional Impact Analysis

In addition to the above analyses, the applicant must provide an evaluation of impacts to: soils, vegetation, and wildlife; air quality related to general commercial, residential and industrial growth in the area that may result from the project. Additionally, the proposed project will be located 175 km from the closest portion of the nearest PSD Class I area, the Chassahowitzka NWA. Based on the Department's consultation with federal land manager and the applicant, no long range transport modeling was required for determining PSD Class I increment or regional haze impacts because of the distance to the nearest Class I area and the level of emissions.

PSD Significant Pollutants for the Project

As discussed previously, the proposed project will increase emissions of the following pollutants in excess of the PSD significant emissions rates: CO and PM_{10}. For the purposes of any required analysis, only PM_{10} emissions will be considered when modeling particulate matter.

Preconstruction Ambient Monitoring Analysis

Using the AERMOD model, the applicant predicted the following maximum ambient impacts from the project.

De Minimis Air Quality Levels				
Pollutant	**Averaging Time**	**Maximum Predicted Impact (μg/m^3)**	**De Minimis Concentration (μg/m^3)**	**Greater than De Minimis?**
CO	8-hr	102	575	No
PM_{10}	24-hr	5.2	10	No
$PM_{2.5}$	24-hr	5.2	2.3	Yes

As shown above, CO and PM_{10} are exempt from preconstruction monitoring because the predicted impacts are less than the de minimis levels. However, $PM_{2.5}$ is not exempt from preconstruction ambient monitoring. Nevertheless, the Department maintains an extensive quality-assured ambient monitoring network throughout the state. The following table summarizes PM_{10}/$PM_{2.5}$ ambient data from 2008 to 2010 available for existing nearby monitoring locations.

Representative Ambient Concentrations			
Pollutant	**Averaging Time**	**Ambient Concentration**	**Monitor Location**
PM_{10}	Annual	16	Fay Park, Brevard County
	24-hour	74	
$PM_{2.5}$	Annual	8	Melbourne, Brevard County
	24-hour	22	

The existing monitoring data show no violations of any ambient air quality standards. The Department determines that the data collected from these monitors is representative of the air quality in the vicinity of the project and may be used to satisfy the preconstruction monitoring requirements for $PM_{2.5}$. As necessary, the above ambient concentrations will be used as the ambient background concentrations for any required AAQS analysis, which as will be shown later will also include PM_{10} emissions.

Source Impact Analysis for PSD Class I Areas

Affected PSD Class I Areas

PSD Class I Area	Distance	Receptors
Chassahowitzka NWA (CNWA)	175	5

For PSD Class I areas within 200 kilometers of the facility, the table identifies each affected Class I area as well as the distance to the facility and the number of receptors used in the modeling analysis. For the preliminary significant impact analysis, the highest short-term predicted concentrations will be compared to the significant impact levels.

Results of PSD Class I Significant Impact Analysis

The federal land manager waived the requirements to perform a Class I area significant impact analysis due to the distance to the Class I area and low-level emissions from the project. However, the United States Environmental Protection Agency requested that a test of receptors at 50 km in the direction of the Class I area be performed to verify that no particulate Class I area significant impact analysis would be required. Using the AERMOD model, the applicant predicted the following maximum ambient impacts from the project.

Significant Impact Analysis for PSD Class I Areas					
Pollutant	**Averaging Time**	**Maximum Predicted Impact ($\mu g/m^3$)**	**Significant Impact Level ($\mu g/m^3$)**	**Significant Impact?**	**Affected Class I Area**
PM_{10}	Annual	0.006	0.2	No	CNWA
	24-hour	0.17	0.3	No	CNWA

As shown, the maximum predicted impacts are less than the corresponding significant impact levels for each pollutant. Therefore, a full impact analysis for the PSD Class I areas is not required.

Source Impact Analysis for PSD Class II Areas

For the preliminary significant impact analysis, the highest short-term predicted concentrations will be compared to the respective significant impact levels. Since five years of data are available, the highest-second-high (HSH) short-term predicted concentrations will be used for any required AAQS and PSD Class II increment analysis with regard to short-term averages. However, for annual averages, the highest predicted annual average will be compared with the corresponding annual level.

Results of the Significant Impact Analysis

The following table shows the results of the preliminary PSD Class II significant impact analysis.

Significant Impact Analysis for PSD Class II Areas (Vicinity of Facility)					
Pollutant	**Averaging Time**	**Maximum Predicted Impact ($\mu g/m^3$)**	**Significant Impact Level ($\mu g/m^3$)**	**Significant Impact?**	**Radius of Significant Impact (km)**

CO	8-hr	84	500	No	None
	1-hr	143	2,000	No	None
PM_{10}	Annual	0.5	1	No	None
	24-hr	5.2	5	Yes	0.7
$PM_{2.5}$	Annual	0.5	0.3	Yes	4
	24-hr	5.2	1.2	Yes	4

As shown above, the predicted impacts of CO are well below the corresponding PSD Class II significant impact level and no further analysis is required. The 24-hour PM_{10} and the 24-hour and annual predicted impacts of $PM_{2.5}$ are greater than the corresponding PSD Class II significant impact levels; therefore, a full impact analysis for these pollutants is required within the applicable significant impact area as defined by the predicted radius of significant impact identified above. For PM_{10} emissions, a PSD Class II increment analysis and an AAQS analysis must be conducted. For $PM_{2.5}$ only an AAQS analysis was necessary.

Receptor Grids for Performing PSD Increments and AAQS Analyses

For the PSD Class II increment and AAQS analyses, receptor grids are normally based on the size of the significant impact area for each pollutant.

PSD Class II Increment Analysis

The PSD increment represents the amount that new sources in an area may increase ambient ground level concentrations of a pollutant from a regulatory baseline concentration. For PM_{10} the baseline concentrations were established in 1977 with a baseline year of 1975 for existing major sources. The emission values input into the model for predicting increment consumption are based on the maximum emissions rates from increment-consuming sources at the facility as well as all other increment-consuming sources in the vicinity of the facility. The following table summarizes the results of the PSD Class II increment analysis.

PSD Class II Increment Analysis				
Pollutant	**Averaging Time**	**Maximum Predicted Impacts (μg/m^3)**	**Allowable Increment (μg/m^3)**	**Greater than PSD Class II Allowable Increment?**
PM_{10}	Annual	0.5	17	No
	24-hour	6	30	No

As shown above, the maximum predicted impacts are less than the allowable PSD Class II increments.

AAQS Analysis

For each pollutant subject to an AAQS analysis, the total impact on ambient air quality is obtained by adding an ambient background concentration to the maximum predicted concentration from modeled sources. The ambient background concentration accounts for all sources that are not explicitly modeled. The following table summarizes the results of the AAQS analysis for the affected pollutants.

AAQS Analysis						
Pollutant	**Averaging Time**	**Modeled Sources (μg/m^3)**	**Ambient Background Concentration (μg/m^3)**	**Total Impact (μg/m^3)**	**AAQS (μg/m^3)**	**Greater than AAQS?**
PM_{10}	Annual	0.5	16	16.5	50	No
	24-hour	6	74	80	150	No
$PM_{2.5}$	Annual	0.5	8	8.5	15	No
	24-hour	6	22	28	35	No

As shown in this table, impacts from the proposed project are not expected to cause or significantly contribute to a violation of any AAQS.

Additional Impacts Analysis

Impacts on Soils, Vegetation and Wildlife

The maximum predicted ground-level concentrations of CO and $PM_{10}/PM_{2.5}$ from the proposed project and all other nearby sources are below the corresponding AAQS. The AAQS are designed to protect both the public health and welfare. As such, this project is not expected to have a harmful impact on soils, vegetation or wildlife in the vicinity of the project.

Air Quality Impacts Related to Growth

The proposed modification will not significantly change employment, population, housing, commercial development, or industrial development in the area to the extent that a significant air quality impact will result.

Conclusion on Air Quality Impacts

As described in this report and based on the required ambient impact analyses, the Department has reasonable assurance that the proposed project will not cause, or significantly contribute to, a violation of any AAQS or PSD increment.

5. PRELIMINARY DETERMINATION

The Department makes a preliminary determination that the proposed project will comply with all applicable state and federal air pollution regulations as conditioned by the draft permit. This determination is based on a technical review of the complete application, reasonable assurances provided by the applicant, and the conditions specified in the revised draft permit. No air quality modeling analysis is required because the project does not result in a significant increase in emissions. Marilyn Koletzke is the project engineer responsible for reviewing the application and drafting the permit. Cleve Holladay is the project meteorologist responsible for reviewing and summarizing the air quality analysis. Additional details of this analysis may be obtained by contacting the project engineer at the Department's Bureau of Air Regulation at Mail Station #5505, 2600 Blair Stone Road, Tallahassee, Florida 32399-2400.