TECHNICAL EVALUATION
&
PRELIMINARY DETERMINATION

APPLICANT

American Cement Company, LLC
4750 E. CR 470, P.O. Box 445
Sumterville, FL 33585

Sumterville Cement Plant
Facility ID No. 01190042

PROJECT

Draft Permit No. 1190042-009-AC/PSD-FL-361F
Application for Minor Source Air Construction (AC) Permit
Alternative Fuels & Production Rate Increase at the Existing Portland Cement Manufacturing Plant

COUNTY

Sumter County, Florida

PERMITTING AUTHORITY

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

October 2012

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); 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.

Facility Description and Location

This facility is an existing Portland cement manufacturing plant categorized under Standard Industrial Classification No. 3241. The existing Sumterville Cement Plant is located in Sumter County at 4750 E. CR 470 in Sumterville, Florida. The UTM coordinates Zone 17, 399.80 km East and 3181.90 km North.

This site is in an area that is in attainment (or designated as unclassifiable) for all air pollutants subject to state and federal Ambient Air Quality Standards (AAQS).

Facility Regulatory Categories

- The facility is a major source of hazardous air pollutants (HAP).
- This facility does not operate units subject to the acid rain provisions of the Clean Air Act.
- The facility is a Title V major source of air pollution in accordance with Chapter 213, F.A.C.
- The facility is a major stationary source in accordance with Rule 62-212.400, F.A.C. for the Prevention of Significant Deterioration (PSD) of Air Quality.

Project Description

The applicant applied on July 12, 2012, to the Department for a minor source air construction permit. The minor source air construction permit is for alternative fuels and a production rate increase at the existing Portland cement manufacturing plant.

Application Processing Schedule

Application for Air Construction Permit received on July 12, 2012 (complete application).

{Documents specifically related to this project are posted and available on the Department's world wide web site at http://appprod.dep.state.fl.us/air/emission/apds/default.asp by entering the project number shown above.}

Relevant Documents

- Permit No. 1190042-001-AC/PSD-FL-361 (Portland Cement Manufacturing Plant).
- Permit No. 1190042-007-AV, Current Title V Air Operation Permit.

2. PSD APPLICABILITY

General PSD Applicability

For areas currently in attainment with the state and federal AAQS or areas otherwise designated as unclassifiable, the Department regulates major stationary sources of air pollution in accordance with Florida's PSD preconstruction review program as defined in Rule 62-212.400, F.A.C. Under preconstruction review, the Department first must determine if a project is subject to the PSD requirements ("PSD applicability review") and, if so, must conduct a PSD preconstruction review. A PSD applicability review is required for projects at new and existing major stationary sources. In addition, proposed projects at existing minor sources are subject to a PSD applicability review to determine whether potential emissions *from the proposed project itself* will exceed the PSD major stationary source thresholds. A facility is considered a major stationary source with respect to PSD if it emits or has the potential to emit:

- 250 tons per year or more of any regulated air pollutant; or
- 100 tons per year or more of any regulated air pollutant and the facility belongs to one of the following 28 PSD-major facility categories: fossil fuel-fired steam electric plants of more than 250 million British thermal units per hour heat input, coal cleaning plants (with thermal dryers), Kraft pulp mills, portland cement plants, primary zinc smelters, iron and steel mill plants, primary aluminum ore reduction plants, primary copper smelters, municipal incinerators capable of charging more than 250 tons of refuse per day, hydrofluoric, sulfuric, and nitric acid plants, petroleum refineries, lime plants, phosphate rock processing plants, coke oven batteries, sulfur recovery plants, carbon black plants (furnace process), primary lead smelters, fuel conversion plants, sintering plants, secondary metal production plants, chemical process plants, fossil fuel boilers (or combinations thereof) totaling more than 250 million British thermal units per hour heat input, petroleum storage and transfer units with a total storage capacity exceeding 300,000 barrels, taconite ore processing plants, glass fiber processing plants and charcoal production plants.

Once it is determined that a project is subject to PSD preconstruction review, the project emissions are compared to the "significant emission rates" (SERs) defined in Rule 62-210.200, F.A.C. for the following pollutants: carbon monoxide (CO); nitrogen oxides (NO_X); sulfur dioxide (SO_2); particulate matter (PM); particulate matter with a mean particle diameter of 10 microns or less (PM_{10}); volatile organic compounds (VOC); lead (Pb); fluorides (F); sulfuric acid mist (SAM); hydrogen sulfide (H_2S); total reduced sulfur (TRS), including H_2S; reduced sulfur compounds, including H_2S; municipal waste combustor organics measured as total tetra- through octa-chlorinated dibenzo-p-dioxins and dibenzofurans; municipal waste combustor metals measured as PM; municipal waste combustor acid gases measured as SO_2 and hydrogen chloride (HCl); municipal solid waste landfills emissions measured as non-methane organic compounds (NMOC); and mercury (Hg). In addition, significant emissions rate also means any emissions rate or any net emissions increase associated with a major stationary source or major modification which would construct within 10 kilometers of a Class I area and have an impact on such area equal to or greater than 1 $\mu g/m^3$, 24-hour average.

If the increase in emissions from the project exceeds the defined significant emissions rate of a PSD pollutant, the project is considered "significant" for the pollutant and the applicant must employ the Best Available Control Technology (BACT) to minimize the emissions and evaluate the air quality impacts. Although a facility or project may be *major* with respect to PSD for only one regulated pollutant, it may be required to install BACT controls for several "significant" regulated pollutants.

List of Significant Emission Rates by PSD-(Air) Pollutant Relevant to the Facility [1]

PSD-(Air) Pollutant	SER, tons/year	PSD-(Air) Pollutant	SER, tons/year
PM	25	PM_{10}	15
$PM_{2.5}$	10		
$PM_{2.5}$ (NOx)	40	$PM_{2.5}$ (SO_2)	40
CO	100	NO_X	40
Ozone (NOx) [2]	40	Ozone (VOC) [2]	40
SO_2	40		
Fluorides	3	Lead	0.60
Mercury	0.10	Sulfuric acid mist (SAM)	7

1. There is federal SER of 75,000 tons/year for Greenhouse Gases (GHG) as carbon dioxide equivalent (CO_2e) that has not been incorporated into Department rules.
2. $PM_{2.5}$ is also regulated through precursors (NOx and SO_2); Ozone (O_3) is regulated through precursors (VOC and NOx).

3. APPLICANT REVIEW

Background

The applicant applied on July 12, 2012, to the Department for a minor source air construction permit. The minor source air construction permit is for alternative fuels and a production rate increase at the existing Portland cement manufacturing plant.

The air construction permit application submitted to the Department was subdivided basically into two parts. The first part of the permit application focused on the production rate increase part of the project then the alternative fuels part of the project.

Production Rate Increase

The first part of the permit application is a request to increase the production capacity of the cement plant from 3,000 short tons of clinker per day (TPD) to 3,250 short TPD by taking advantage of the plant's designed and as built capacity. This represents an increase in clinker production of 8.3%. The applicant claims that there will be no physical plant modifications needed to accomplish this rate increase. A signed letter from Mr. Cary O. Cohrs, President of the Sumterville Cement Plant, dated July 3, 2012 (attached to the air permit application) provides explanations of the plant's designed and as built capacity.

The current permitted clinker production rate is 1,095,000 short tons per year (TPY) and 125 short tons per hour (TPH) at the current permitted capacity of 3,000 short TPD of clinker.

Project's Effect on Air Pollutant Emissions

At a higher production rate of tons of clinker produced, the mass equivalent "lbs/hour" and "TPY" air pollutant emissions would typically be adjusted upwards to reflect the air pollutant emissions at the higher production rate ("lb air pollutant/ton clinker produced" standard x TPH & TPY of clinker produced = mass equivalent, "lbs/hour" & "TPY" air pollutant emissions). With an increased clinker production rate the adjustments would represent an increase in air pollutant emissions of the "lbs/hour" and "TPY." The level of change in air pollutant emissions (net change) are always reviewed against the PSD SERs (thresholds to trigger PSD BACT review).

To avoid an increase in air pollutant emissions, the applicant proposed to keep the previously established "lbs/hour" and "TPY" limitations the same by adjusting downwards (-8.3%) the "lb air pollutant/ton clinker produced" standards by the same level as the production rate increase (+8.3%). This election by the applicant restricts air pollutant emissions to the same mass equivalent "lbs/hour" and "TPY" levels resulting in no increases in permitted emissions.

Alternative Fuels

The second part of the permit application is a request for the installation, shakedown, and assessment of equipment for the handling and firing of alternative fuels and for the use of several alternative fuels on a permanent basis. The handling of alternative fuels includes transport on-site, storage, and processing. The on-site processing of the materials is requested.

Project's Effect on Air Pollutant Emissions

The applicant indicated that the firing of alternative fuels (AF) in the kiln will not result in an increase in air pollutant emissions. According to the applicant the reason for no increase in air pollutant emissions from the firing of AF in the kiln was due to the similarity of the characteristics of the alternative fuels and the traditional fuels they will replace.

The applicant indicated that a slight increase in $PM/PM_{10}/PM_{2.5}$ emissions occurs from the transportation, storage, handling and processing of AF, yet the emissions are less than the PSD SERs (significant emission rates) for $PM/PM_{10}/PM_{2.5}$. Particulate matter emissions were estimated to be 13.1 TPY for PM, 2.7 TPY for PM_{10} and 0.6 TPY for $PM_{2.5}$.

To demonstrate that there will be no increase in air pollutant emissions from the AF, the applicant proposed to measure, track and report air pollutant emissions for up to 10 (ten) years from completion of the project in accordance with Rule 62-212.300(1)(e), F.A.C.

4. DEPARTMENT REVIEW

The Sumterville cement manufacturing plant was originally permitted in 2006 under Permit No. 1190042-001-AC/PSD-FL-361. This Portland cement manufacturing plant started up in May of 2009.

The Department's review first focuses on the production rate increase part of the project then the alternative fuels part of the project.

Review of Cement Kiln (Emissions Unit ID No. 003): Operating Data and Emissions Data

The cement kiln's operating data and NOx emissions data were obtained from the air permit application submitted to the Department. Entire calendar year data was available for 2009 - 2011. The calendar year 2011 data was the most recent complete yearly data available. The operating data and NOx emissions data is summarized in **Table 1.**

Table 1. Cement Kiln: Operating Data and NOx Emissions Data 2009 -2011

Calendar Year	Hours of Operation [1]	NOx, tons [1]	Clinker Production, tons [1]	Calculated equivalent lb NOx/ton clinker produced [2]	NOx limit in effect lb NOx/ton clinker produced
2009	1,422	-	122,236	-	-
2010	4,204	305.6	339,866 (252,598 [3])	2.42	3.0
2011	4,435	331.8	361,284	1.84	1.95

[1] Data reported in Table 1 of the air permit application. The NOx data was reported as being from the NOx CEMS.
[2] A calendar year value.
[3] Clinker production post-CEMS certification.

The kiln started up in May of 2009. The NOx CEMS was certified the end of March 2010; this is when certified CEMS data became available. **Table 1.** shows that the kiln has operated more each successive year. The "Calculated equivalent lb NOx/ton clinker produced" values shown in **Table 1.** were 1.84 and 2.42 lb NOx/ton clinker produced in calendar years 2011 to 2010, respectively. The NOx emission standard in effect in 2011 was 1.95 lb NOx/ton clinker produced based on a 30-day rolling average. The NOx emission standard in effect in 2010 was 3.0 lb NOx/ton clinker produced based on a 30-day rolling average. The margin of compliance with the NOx emission standards was therefore roughly 6-19% on this annualized basis.

Production Rate Increase

The applicant requested to increase the production capacity of the cement plant from 3,000 short tons of clinker per day (TPD) to 3,250 short TPD. The annual clinker production from the plant's proposed capacity of 3,250 short TPD is 1,186,250 short tons per year

Air pollutant emission change calculations in the air permit application were based on a requested increase in clinker production rate of 1,186,250 short TPY equivalent to 135.42 short TPH of clinker production. The new cement production is expected to be about 1,245,837 short TPY, or nominally 1,300,000 short TPY.

Project's Effect on Air Pollutant Emissions

The applicant described in detail the proposed changes to air pollutant emission standards and limitations to the emission units at the facility in Table 2 of the air permit application. The permit processor accepts the calculations and proposed affects on air pollutant emissions to the affected emission units at the facility.

Based on the actual NOx CEMS data previously cited, the applicant's lower (proposed) NOx standard of 1.80 lb NOx/ton of clinker produced seems achievable by the plant's cement kiln. The % reduction from the current NOx standard to the new lower NOx standard is 8.3% which is within the margin of compliance previously stated. Adjustments to the SNCR system, i.e., increased ammonia injection, can be made to reduce NOx emissions to the 1.80 lb NOx/ton of clinker produced standard. The Department therefore has reasonable assurance of the kiln's compliance with the lower NOx limit.

PSD Applicability for Project

Rule 210.200(252)(d), *Projected Actual Emissions*, F.A.C. (Effective 03/28/2012) allows the use of potential to emit (permitted emissions) to be used as the projected actual emissions. The Department accepts the applicant's proposed use of permitted emissions (potential to emit) as projected actual emissions due to the current state of our economy as indicated by the low operation of the cement kiln and the precedence established by Permit No. 0530021-033-AC, final permit issued on June 28, 2011.

Based on what the applicant has provided and proposed in Table 2 of the air permit application, there are no expected significant emission rate increases from the proposed project. The project therefore is not subject to PSD preconstruction review, avoiding PSD BACT.

The restrictions to result in no net increases in air pollutant emissions are necessary and are therefore placed into the AC permit authorizing the higher clinker production rate at the plant.

Initial compliance demonstration (testing) is specified in the permit to provide the Department reasonable assurances that the new (proposed) emission standards & limits and existing emission standards & limits are complied with by the affected emission units at the facility at the higher clinker production rate.

Alternative Fuels

The second part of the permit application is a request for installation, shakedown, and assessment of equipment for handling and firing of a variety of alternative fuels and for the use of several alternative fuels on a permanent basis.

The applicant requests the storing, handling and firing of 280,000 tons per year (TPY) of AF, equivalent to a feed rate of about 32 tons per hour (TPH) of AF to the kiln and calciner. The feed rate to the kiln and calciner at the higher production rate is about 225 TPH. The requested AF quantity represents about 16% of the total feed rate to the kiln/calciner.

Specific details on the individual alternative fuels requested along with a thorough evaluation of each's impact on air pollutant emissions can be found in the air permit application (see Pages 40 - 56 & 60 - 71) prepared by the applicant for this project.

The Department has already permitted other Portland cement manufacturing plants in the state of Florida to store, handle and fire a similar variety of requested alternative fuels. The following table lists the other Portland cement manufacturing plants in the state of Florida permitted to store, handle and fire a similar variety of the applicant's requested alternative fuels:

Portland Cement Manufacturing Plants in Florida Permitted to Store, Handle and Fire a Similar Variety of the Applicant's Requested Alternative Fuels

	Facility Name-Site (Plant) Name	Facility ID Number
1.	Suwannee American Cement, LLC-Branford Cement Plant	1210465
2.	CEMEX-Brooksville North {Kiln No. 1 only, tire-derived fuel}	0530010
3.	CEMEX-Brooksville South	0530021
4.	Tarmac (Titan America, LLC)-Pennsuco Complex	0250020
5.	CEMEX-Miami Cement Plant	0250014

The permit processor has reviewed other air permitted projects with the similar variety of requested alternative fuels.

Previously prepared Technical Evaluation & Preliminary Determination (TE&PD) documents from the air permit projects authorizing alternative fuels contain numerous pictures along with detailed descriptions and a thorough evaluation of each's impact on air pollutant emissions. The TE&PD documents for each air permitted project can be accessed on the Department's world wide web site at http://appprod.dep.state.fl.us/air/emission/apds/default.asp.

For example, a TE&PD with a good level of detail was prepared by the Department for Air Permit No. 0530021-039-AC for the CEMEX-Brooksville South plant. This TE&PD was prepared recently on March 27, 2012. This TE&PD can be accessed by entering Project (Permit) No. 0530021-039-AC at the web site, navigating to the Permit Status - Draft, then going to Project Documents - Zip File. The TE&PD is contained within the zipped files.

Project's Effect on Air Pollutant Emissions

For the same reason as indicated by the applicant, the Department expects no increase in air pollutant emissions from the firing of AF in the kiln due to the similarity of the characteristics of the alternative fuels and the traditional fuels they will replace. Air pollutant emissions are well controlled at the Sumterville Cement Plant. Air pollutant emission control techniques, measures and devices at the plant include:

A selective non-catalytic reduction (SNCR) system with ammonia injection in the preheater/calciner for the control of NOx emissions, combustion devices & techniques like low-NOx burners in the kiln, an indirect firing system by the burners in the kiln, staged combustion in the preheater/calciner;

Complete combustion in the kiln and calciner, and minimizing carbon and oily content of raw materials to minimize CO and VOC emissions;

Low sulfur content fuels and raw materials along with natural lime process scrubbing in the calciner for the control of SO_2 emissions; and,

A main baghouse, numerous other baghouses for the control of PM/PM_{10} emissions and employing reasonable precautions to minimize fugitive PM/PM_{10} emissions.

PSD Applicability for Project

The applicant calculated the emission changes associated with the transportation, storage, handling and processing of 280,000 tons per year (TPY) of AF in Tables 2 & 3 of the air permit application.

The applicant estimated increases in emissions from the AF under the Emissions Unit ID No. 008, Fugitive Dust from Storage Piles, Paved Roads, and Unpaved Road. The new emissions (projected increases) compared to the PSD SERs are shown as follows:

Emissions Unit ID No. 008, Fugitive Dust from Storage Piles, Paved Roads, and Unpaved Road Projected Increases in Emissions vs. PSD SERs

PSD-(Air) Pollutant	Projected Increases in Emissions, TPY (tons/year)	PSD SER, TPY	PSD SER exceeded?
PM	13.1	25	No
PM_{10}	2.7	15	No
$PM_{2.5}$	0.6	10	No

Projected increases in emissions at the other existing emissions units at the facility were either not applicable (NA) or were 0 TPY (see Table 2 of the air permit application).

The air construction permit application for the project to avoid PSD BACT was based in whole or in part on projected actual emissions. The projected actual emissions are shown in the table below. The baseline actual emissions from the *existing* emissions units were set at the permitted emissions (potential to emit).

Baseline Actual Emissions vs. Projected Actual Emissions Used under this Project

PSD-(Air) Pollutant	Baseline Actual Emissions, TPY (tons/year)	Projected Actual Emissions, TPY	Increase in Emissions, TPY	PSD SER, TPY	PSD SER exceeded?
PM	177.6	190.7	13.1	25	No
PM_{10}	149.5	152.2	2.7	15	No
$PM_{2.5}$	0	0.6	0.6	10	No
NOx	1,068	1,068	0	40	No
CO	1,588	1,588	0	100	No
VOC	65.7	65.7	0	40	No
SO_2	109.5	109.5	0	40	No
Hg	0.061	0.061	0	0.10	No

Since the plant is already equipped with COMS for VE, CEMS for NOx, THC, SO_2 and Hg, changes to these individual air pollutant emissions when burning alternative fuels in the kiln can be easily evaluated.

Air pollutant emissions can be measured and tracked to determine whether or not there were in fact any net emission increases resulting from this project. Specific requirements to measure, track and report air pollutant emissions of concern associated with this project are placed in the AC permit.

Based on what the applicant has provided and based on the permit processor's review of other similar air permitted projects, there are no expected significant emission rate increases from the proposed project. The project therefore is not subject to PSD preconstruction review.

5. PRELIMINARY DETERMINATION

The Department makes a preliminary determination that the proposed project will comply with all applicable state rules 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 draft permit. No air quality modeling analysis is required because the project does not result in a significant increase in emissions.

Mr. Scott M. Sheplak, P.E. is the permit processor responsible for reviewing the application and drafting the permit. Additional details of this analysis may be obtained by contacting him by telephone at 850/717-9074 or by e-mail at scott.sheplak@dep.state.fl.us in the Department's Office of Permitting and Compliance at Mail Station #5505, 2600 Blair Stone Road, Tallahassee, Florida 32399-2400.