TECHNICAL EVALUATION
&
PRELIMINARY DETERMINATION

APPLICANT

Suwannee American Cement
5117 U.S. Highway 27
Branford, Florida 32008

Branford Cement Plant
Facility ID No. 1210465

PROJECT

Project No. 1210465-022-AC
Revision to Temporary Trial of Multiple Alternative Fuels

COUNTY

Suwannee County, Florida

PERMITTING AUTHORITY

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

June 28, 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); 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 the draft permit.

Facility Description and Location

Suwannee American Cement operates an existing Portland cement manufacturing plant, which is categorized under Standard Industrial Classification Code No. 3241. The existing Branford Cement Plant is located in Suwannee County at 5117 U.S. Highway 27 in Branford, Florida. The UTM coordinates of the existing facility are Zone 17, 321.4 kilometers (km) East, and 3315.9 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).
- The 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.

Description of the Existing Pyroprocessing System

The existing kiln at the Branford Cement Plant is a dry preheater/precalciner kiln, a design which improves the thermal efficiency and production capacity by adding material feed separators (cyclone vessels) arranged vertically in a preheater tower before the kiln. Hot exhaust gas passes through the material feed separators in the preheater tower counter to the raw material flow, which provides heat transfer between the gas and solid streams. The improved heat transfer allows the kiln length to be reduced as well as dry the raw materials in the raw mill.

Coal and petroleum coke are burned in the precalciner combustion chamber at the inlet to the kiln as well as at the main burner at the discharge end of the kiln. Temperatures reach approximately 3000° F in the main burner flame, 2200° F in the kiln and 1800° F in the calciner. The applicant provided the following schematic representing the conditions of a modern preheater/pre-calciner kiln.

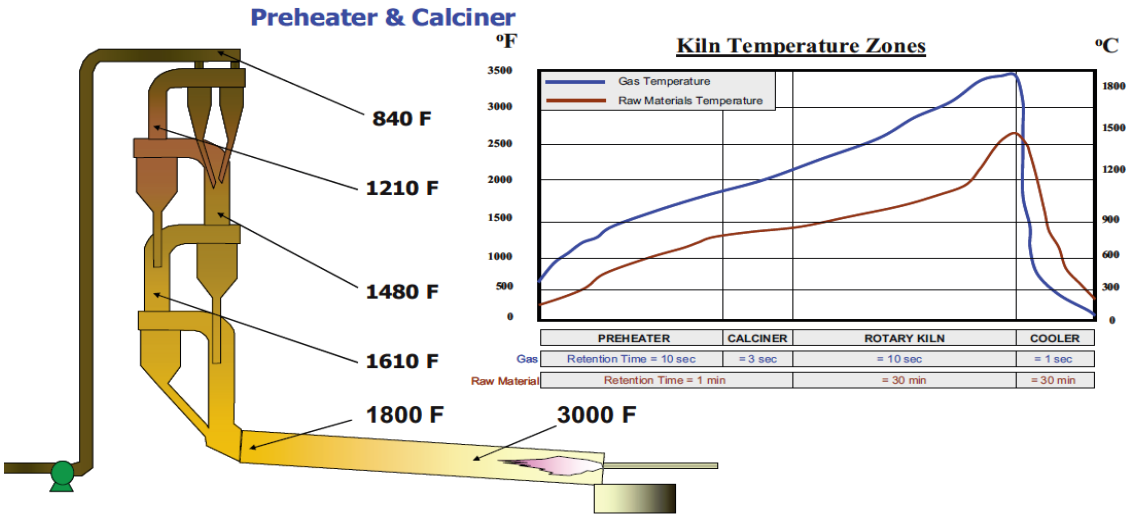

Figure 1. Kiln Temperatures and Retention Times

As shown, gas temperatures in the calciner are approximately 1800° F with a 3 second retention time. Gas temperatures at the inlet to the kiln exceed 2000° F. The high temperatures and long retention times provide excellent combustion of fuels. Figure 2 is a process flow diagram for a dry process preheater/pre-calciner cement plant.

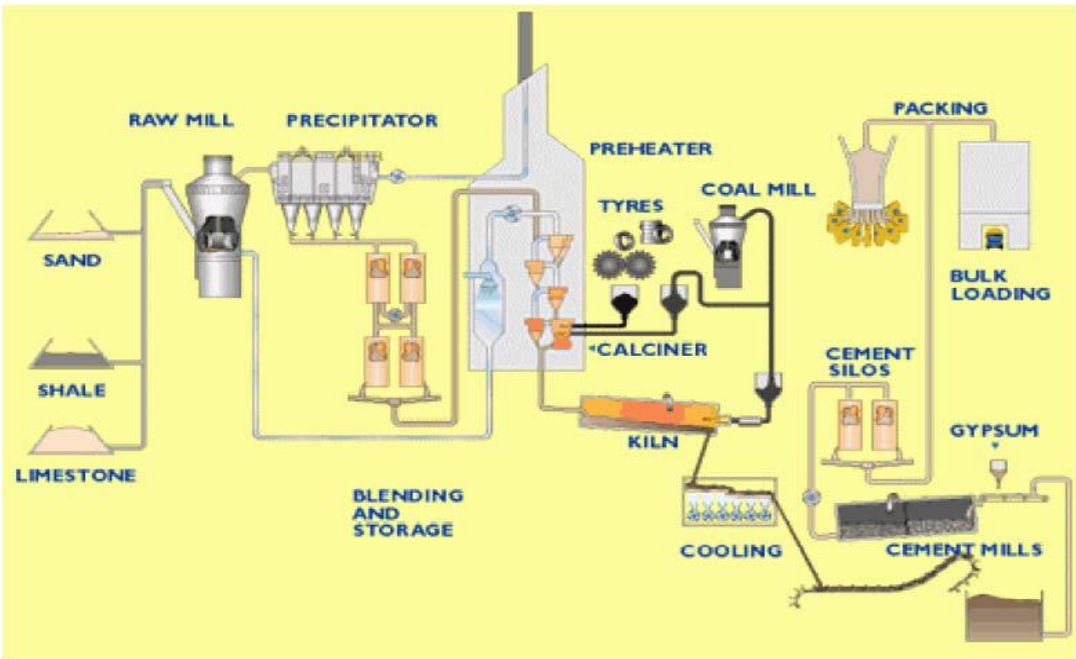

Figure 2. Process Flow Diagram - Dry Process Preheater/Precalciner Cement Plant [1]

As shown, an induced draft fan pulls hot exhaust gases from the kiln through the preheater tower, the raw mill, a baghouse and out the stack. Raw materials (limestone, sand and iron ore) are fed into the raw mill, which grinds and mixes the raw materials to form raw meal. Raw meal is transferred to the raw meal storage silo

[1] From the Department's Project No. 1210465-004-AC; Originally from Blue Circle Home Page at http:/www.cement.bluecircle.co.uk; Teleconference between A.A. Linero (Florida DEP) and W. McLendon (Blue Circle) with permission to use modified version of Blue Circle cement process diagram; March 19, 2001.

countercurrent to the hot exhaust gas, which is used to dry the raw meal. Raw meal is fed into the preheater tower, where the solid materials again flow countercurrent to the hot exhaust gas, which preheats the raw meal before being introduced to the pyroprocessing kiln. The kiln transforms the raw meal into cement clinker, which is cooled and eventually ground to size in the finish mill with other additives to form the final cement product.

For the Branford Cement Plant, particulate matter from the kiln and the raw mill are controlled by the baghouse and not the electrostatic precipitator shown in the above figure. Dust collected in the baghouse is diverted to the raw meal storage silo since this material is basically raw meal. This type of pyroprocessing system eliminates cement kiln dust (CKD), which used to be handled as a waste product. When the raw mill is off line, the raw meal silo contains enough raw meal to continue operating the kiln for approximately two days until the raw mill is brought back on line.

Emissions of nitrogen oxides are controlled by a selective non-catalytic reduction (SNCR) system. Emissions of nitrogen oxides (NO_X), sulfur dioxide (SO_2) and total hydrocarbons (THC) are monitored with certified continuous emissions monitoring systems (CEMS). Stack opacity is monitored with a certified continuous opacity monitoring system (COMS). Carbon monoxide (CO) emissions are monitored with process CEMS.

Temporary Short-Term Trials of Multiple Alternative Fuels

On November 12, 2010, the Department issued Permit No. 1210465-020-AC, which authorized short-term operational trials to co-fire coal in existing Kiln No. 1 with the following materials: non-chlorinated agricultural plastics, tire-derived fuel, manufacturer reject roofing shingles, used roofing shingles, clean woody biomass, agricultural fibrous organic byproducts (e.g., peanut hulls, rice hulls, corn husks, citrus peels, cotton gin byproducts and animal bedding), pre-consumer reject paper, post-consumer waste paper and carpet derived fuel. See the Technical Evaluation and Preliminary Determination for this project. To date, the plant has completed a portion of the trial burn for non-chlorinated agricultural plastics.

On June 1, 2011, the permittee requested a modification to:

- Increase the trial from 30 operating days to 90 operating days;
- Remove the specific manufacturer name for the temporary feed equipment;
- Re-define non-chlorinated agricultural film as non-chlorinated plastics;
- Refer to NESHAP Subpart M in 40 CFR 61 for asbestos testing requirements for used roofing shingles;
- Add a trial for alternative fuel mixes;
- Add 5,000 tons of engineered fuel to the trial of alternative fuels;
- Remove the requirements for stack testing for dioxins/furans, HCl, pesticides and metals; and
- Remove the requirement for reporting information considered confidential by the applicant in the test report.

In addition the permittee requested increases in the amount of alternative fuels as follows:

- Non-chlorinated plastics from 1,250 tons to 3,000 tons;
- Pre-consumer paper from 3,500 tons to 5,000 tons;
- Post-consumer paper from 3,500 tons to 5,000 tons; and
- Carpet-derived fuel from 2,500 tons to 6,500 tons.

Suwannee American Cement (SAC) in partnership with its material suppliers is working to develop an engineered fuel material. As part of these efforts, a large representative pre-trial samples (approximately 2 tons) of material was received from the supplier and classified by hand into various components to determine a baseline for future comparisons. Initial analysis involved hand sorting the material to identify and classify all combustible components. The materials were classified by visual inspection and sorted into the following categories:

- Wood Products: non-treated lumber, plywood, fiber board, laminate board, etc.
- Foam, Fabrics and Carpet: cellulose, polystyrene, polyurethane, fabrics, carpet, leather, etc.
- Paper Materials: paper, corrugated cardboard, wax paper, tar paper, etc.

- Plastic Materials: plastic containers, films, etc. (small amounts of PVC were present, but chloride concentration as measured is around 0.03%)

Based on this analysis expected concentrations of the classified combustibles, on a mass percent basis, are as follows: 62.4% wood products, 10.7% foam, fabrics and carpet, 12.2% paper materials and 14.7% plastic material. SAC also created homogenized samples of the material and shipped them out for third party external analysis of the following (see analysis results in Table 1): Proximate & Ultimate Analysis – ASTM Method D5142, D4239, 5865, & 5373, Metals – SW 846-6010B, 7470A/7471A, Chloride, Fluoride, & Bromide – SW 846 9056 & 5050.

Table 1: Initial pre-trial results of engineered fuel material.

PROXIMATE & ULTI MATE ANALYSIS	Method	Units	AVERAGE	Std Dev	Minimum	Maximum	N	# Non Detect
TOTAL MOISTURE	AST D3302, 5142	% wt	10.74	2.38	8.09	14.46	8	N/A
ASH	ASTM D5142	% wt	26.12	6.36	15.22	33.41	8	N/A
VOLATILE	ASTM D5142	% wt	59.57	6.98	49.92	70.21	8	N/A
FIXED CARBON	Calculation	% wt	3.57	3.12	0.13	8.58	8	N/A
SULFUR	ASTM D4239	% wt	1.28	0.68	0.37	2.13	8	N/A
CALORIFIC VALUE	ASTM D5865	BTU/lb	5,694	1,353	3,746	7,746	8	N/A
CARBON	ASTM D5373	% wt	32.96	5.00	28.74	41.18	8	N/A
HYDROGEN	ASTM D5373	% wt	4.15	0.66	3.56	5.21	8	N/A
NITROGEN	ASTM D5373	% wt	0.67	0.13	0.56	0.94	8	N/A
OXYGEN BY DIFFERENCE	Calculation	% wt	24.08	3.35	20.81	29.72	8	N/A
Halides	**Method**	**Units**	**AVERAGE**	**Std Dev**	**Minimum**	**Maximum**	**N**	**# Non Detect**
CHLORIDE	SW846 9056	% wt	0.031	0.004	0.026	0.035	4	0
FLUORIDE	SW846 9056A	% wt	0.0011	0.0005	0.0008	0.0018	4	0
BROMIDE	SW846 5050	% wt	0.0021	0.0003	0.0018	0.0024	4	0
Metal	**Method**	**Units**	**AVERAGE**	**Std Dev**	**Minimum**	**Maximum**	**N**	**# Non Detect**
ARSENIC	SW846 6010B	% wt	0.0023	0.0011	0.0014	0.0037	4	0
BARIUM	SW846 6010B	% wt	0.014	0.013	0.003	0.033	4	0
CADMIUM	SW846 6010B	% wt	0.0042	0.0083	0.0000	0.0166	4	0
CHROMIUM	SW846 6010B	% wt	0.0038	0.0008	0.0028	0.0048	4	0
COPPER	SW846 6010B	% wt	0.0047	0.0016	0.0032	0.0067	4	0
LEAD	SW846 6010B	% wt	0.0027	0.0013	0.0014	0.0042	4	0
MAGNESIUM	SW846 6010B	% wt	0.425	0.289	0.199	0.809	4	0
MERCURY	7470A/7471A	mg/kg	0.24	0.044	0.200	0.290	4	0
NICKEL	SW846 6010B	% wt	0.0011	0.001	0.000	0.003	4	0
SELENIUM	SW846 6010B	% wt	0.00024	0.000	0.000	0.000	4	2
SILVER	SW846 6010B	% wt	0.000033		0.000	0.000	4	3
THALLIUM	SW846 6010B	% wt	Non Detect		0.000	0.000	4	4
ZINC	SW846 6010B	% wt	0.013	0.001	0.011	0.016	4	0

SAC will use this collected data as a baseline for comparison to test trial results for variability and will provide the results of this comparison in the test burn report submitted after completion of the engineered fuel material test trial. SAC will also work with its suppliers to continuously improve the quality of the engineered fuel material based on SAC's fuel requirements.

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. An existing, new or modified facility is considered a major stationary source with respect to PSD if it emits or has the potential to emit:

- 5 tons per year or more of lead;

- 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 listed 28 PSD-major facility categories (which include Portland cement plants).

The regulated PSD pollutants include: 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; and mercury (Hg). There are additional PSD pollutants specific to municipal waste combustors and landfills.

A PSD applicability review is required for all projects at new and existing major and minor stationary sources. Once it is determined that the existing facility is, or that the new or modified facility will be, a major stationary source, the project emissions increases are then compared to the "significant emission rates" defined in Rule 62-210.200, F.A.C. for the PSD pollutants. If the potential emissions increase exceeds the defined significant emissions rate of a PSD pollutant, the project is considered "significant" for the pollutant. Also, note that 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. For each significant PSD pollutant, 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 "significant" for several PSD pollutants.

PSD Applicability for Project

Based on firing alternative fuel materials in similar cement kilns at plants in the United States and other countries, the applicant predicts that co-firing alternative fuel materials with coal/petroleum coke will result in negligible changes in the emission rates of PSD pollutants for the following reasons.

- CO and VOC emissions will be controlled by the high temperatures and long residence time in the calciner (1600 to 1800° F for 3 seconds), which was specifically designed with a separate calciner chamber for firing alternative fuels. CO will be monitored continuously with a process monitor and THC will be monitored continuously with a certified CEMS as a surrogate for VOC emissions.
- NO_X emissions will be controlled with the existing SNCR system by adjusting the ammonia injection rate as necessary. NO_X emissions will be continuously monitored by certified CEMS.
- Particulate matter will be controlled with the existing baghouse. The combustion of alternative fuel materials is not expected to generate substantially more particulate matter than coal combustion considering the largest portion of particles removed by the baghouse are raw materials used in making cement. The stack opacity is continuously monitored by COMS, which will provide an indication of potential changes in PM emission rates.
- SO_2 and HCl emissions increases will be negligible because of the natural scrubbing due to the highly alkaline limestone introduced as a raw material and the thorough mixing of limestone with the exhaust gas by the rotating kiln as well as the turbulence provided in the preheater/precalciner section.
- Based on previous studies for this industry, more than 99.7% of the lead will be captured and bound in the cement clinker and retained in the final cement product. Other metal emissions are expected to be negligible from firing the requested alternative fuels. Most of these materials do not normally contain metals. For the engineered fuel, metals are recovered by the supplier as a valuable commodity. Metals that do enter the calciner would be removed in the baghouse dust, which is re-circulated to the preheater tower as feed. Tests on similar kilns indicate that semi-volatile and non-volatile metals are eventually incorporated into the clinker. Only mercury, a highly volatile metal is expected to be emitted. For mercury, the plant is required to

conduct a material balance on all of the raw materials and fuels to demonstrate compliance with the mercury limit.

- Dioxin/Furan (D/F) emissions will continue to be destroyed by the long residence times at high temperatures in the kiln (~10 seconds at 2,800°F) and calciner (~3 seconds at 1,800°F) and inhibited from reforming by rapid gas cooling in the preheater tower. The baghouse inlet temperature will be continuously monitored to ensure effective D/F control.

The following table summarizes the applicant's PSD applicability for the project.

Table 2. Applicant's PSD Applicability Analysis, Revised

Pollutant	Emissions for Temporary Trial, tons/year		Subject to PSD?
	Increase	Significant Emissions Rate	
CO	-9.9	100	No
NO_X	-39.2	40	No
PM	17.5	25	No
PM_{10}	12.1	15	No
$PM_{2.5}$	5.4	10	No
SO_2	2.4	40	No
VOC	3.7	40	No
Hg	-6.8 lb[a]	200 lb/year	No
Pb	4 lb [b]	1200 lb/year	No

Notes:

a. The current permit limits mercury emissions to less than 97 pounds, which is less than the PSD significant emissions rate.

b. Previous tests on cement kilns indicate that 99.7% or more of the lead is retained in the cement clinker. [2, 3]

c. With regard to particulate matter with a mean particle diameter of 2.5 microns or less ($PM_{2.5}$), 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.

d. The increase includes the temporary shredder/screening operations.

As shown in the above table, total project emissions are not expected to exceed the PSD significant emissions rates; therefore, the project is not subject to PSD preconstruction review.

3. DEPARTMENT REVIEW

Applicant's Project Objective

In response to the economic downturn and newly proposed regulations, the Branford Cement Plant is seeking to

[2] "Hazardous Waste Combustion in Industrial Processes: Cement and Lime Kilns", EPA document EPN/600/S2-87/095, February 1988.

[3] "Use of Cement Kilns in Managing Solid and Hazardous Wastes: Implementation in Australia Heart", Sunil, Griffith University, 1994.

develop alternative fuel materials that will displace coal and fly ash to lower operating costs and eventually reduce mercury emissions.

Operating Capacity and Production

According to the Portland Cement Association, cement production in Florida was more than 12 million tons in 2006 and has dropped each year to a low of just over 4 million tons in 2009. In addition to preventing the construction of several of the new kilns, this situation has caused the shutdown of recently constructed and existing kilns. The Branford Cement Plant began operation in 2005 and has a maximum permitted Portland cement production capacity of 965,425 tons of clinker per year. Cement production peaked in 2007 at approximately 845,000 tons per year of clinker (88% capacity), but dropped to 675,000 tons in 2008 (70% capacity) and then to 385,000 tons in 2009 (40% capacity) with a downturn in the economy. Currently, the plant operates when there is sufficient product demand, but is otherwise idle.

The pre-calciner at the entrance to the kiln was specifically designed to accept alternative materials for use as fuels or ingredients. In particular, the original permit authorized the use of power plant fly ash as an alternative fuel and ingredient, which is common for the industry and can improve the overall strength of the cement product. Alternative materials are introduced pneumatically into the pre-calciner through a six-inch diameter duct.

The increase in the amount of alternative fuel materials does not increase emissions significantly as shown in Table 2. Mixing the proposed alternative fuel allows the plant to develop a fuel that meets the temperature and flame characteristic requirements of the kiln. SAC will work with its supplier(s) to continuously improve the quality of the engineered fuel material based on SAC's fuel requirements.

Summary of Cement Kiln Emissions

Other applicants requesting to use alternative fuels in kilns have submitted data regarding the use of alternative fuels in Europe. The European Commission created a summary report[4] of the emissions data from cement kilns in over 23 European countries. The report provides summaries of the relative emissions differences from firing a broad range of alternative fuels at replacement rates of greater than 40 percent heat input to the kiln. A review of the summaries is in the table below.

Table 3. European Kilns Pollutant Emissions

Pollutant	0% Substitution	40 % Substitution	Change in Emissions
PM	0.0183 gr/dscf	0.0091 gr/dscf	50% decrease
SO_2	80.6 ppm	62.8 ppm	22% decrease
NO_X	499.9 ppm	283.9 ppm	43% decrease
TOC	16.7ppm	14.7 ppm	12% decrease

Note: About 90% of the kilns represented in the summaries are dry process kilns with most re-circulating the dust collected by the control equipment similar to the Branford cement kiln.

In addition, a study[5] supported by the CEMA FOUNDATION (Spanish Cement Association (OFICEMEN) and the two main trade unions in Spain (FECOMA-CCOO and MCA-UGT)) examined cement kiln emissions and the possible health effects on people living near cement plants. After analyzing the risk indices related to the receptors living close to the cement plants, focusing on the exposure by inhalation and ingestion of the soil and fruit and vegetables growth around the studied area, the results demonstrated that there is no significant health risk. Other studies support these findings, for example, the United Kingdom Public Health Agency stated, "There will consequently be little change in the pollution levels in the air that people breathe as this is largely determined

[4] Cement, Lime and Magnesium Oxide Manufacturing Facilities, May 2010, Tables 1.24, 1.32,1.25, 1.38, http://eippcb.jrc.ec.europa.eu

[5] "Emissions and their Possible Environmental and Health in the Surroundings of Cement Plants, Effects", URS Espana

by other sources such as traffic. We are unaware of any evidence that burning substitute fuel (in cement kilns) has caused adverse health effects."[6]

Applicability of Federal Regulations for Portland Cement Plants

NSPS Subpart F in 40 CFR 60 - Portland Cement Plants

This federal regulation applies to all Portland cement plants constructed, reconstructed or modified after August 17, 1971. Except as provided in paragraphs 40 CFR 63.1356(a)(1) and (a)(2), any affected source subject to the provisions of Subpart LLL in 40 CFR 63 (MACT for Portland Cement Plants) is exempt from any otherwise applicable new source performance standard contained in 40 CFR Part 60, Subpart F. The Branford Cement Plan is subject to NESHAP Subpart LLL.

NSPS Subpart Eb – Large Municipal Waste Combustors

This federal regulation applies to municipal waste combustors for which construction is commenced after September 20, 1994 or for which modification or reconstruction is commenced after June 19, 1996. This regulation could apply to cement kilns or boilers firing certain non-traditional solid fuels defined as municipal solid waste. However, 40 CFR 60.50b(p) of this regulation specifically states that, "Cement kilns firing municipal solid waste are not subject to this subpart."

NSPS Subpart CCCC Commercial and Industrial Solid Waste Incineration (CISWI) Units

First promulgated on December 1, 2000, this federal regulation applies to municipal waste combustors for which construction is commenced after November 30, 1999 or for which modification or reconstruction is commenced on or after June 1, 2001. This regulation could apply to cement kilns or boilers firing certain non-traditional solid fuels defined as municipal solid waste. However, as promulgated in 2000, 40 CFR 60.2020(l) specifically provides that cement kilns regulated under NESHAP Subpart LLL in 40 CFR 63 (MACT for Portland Cement Plants) are exempt from compliance with the CISWI rules under NSPS Subpart CCCC. The Branford Cement Plan is subject to NESHAP Subpart LLL.

On March 21, 2011, EPA revised NSPS Subpart CCCC and the new Subpart CCCC requirements became effective on May 20, 2011. However, the 2011 version applies only to new, modified or reconstructed units, which are defined as units constructed after June 2010. EPA's preamble specifically provides that only "incinerators" and "small remote incinerators" remain subject to the standards in the 2000 NSPS Subpart CCCC rules. EPA also states that CISWI units falling within other subcategories, including cement kilns, "… will not in any case …" be subject to the 2000 NSPS Subpart CCCC standards.

Also, in the 2011 version of NSPS Subpart CCCC, new, modified, reconstructed cement kilns will not be exempt from the new CISWI rules. Paragraph (l) of 40 CFR 60.2020 that established the exemption from NSPS Subpart CCCC is now marked "reserved." Waste-burning cement kilns constructed prior to June 4, 2010 are not considered to be "new" units subject to the 2011 NSPS Subpart CCCC standards *unless they are subsequently modified or reconstructed*. However, as described below, EPA also promulgated new solid waste definitions to clarify that some solid waste materials may be processed to qualify as legitimate alternative fuels and ingredients, which would not subject the cement kiln to NSPS Subpart CCCC.

NSPS Subpart DDDD - Emissions Guidelines and Compliance Times for CISWI Units

This federal regulation establishes "emission guidelines" and compliance schedules for the control of emissions from existing CISWI units. This NSPS does not establish standards that apply directly to emission units because the NSPS standards are developed to apply to new units. The emissions guidelines are established for states to develop rules that regulate emissions from existing CISWI units. The 2000 version of Subpart DDDD specifically exempts cement kilns.

Under the 2011 version of Subpart DDDD, waste-burning cement kilns that were constructed after November 30,

[6] http://www.dh.gov.uk/ab/COMEAP/DH_108498

1999, and before June 4, 2010, will be required to comply with the standards and requirements for "existing units" established under the emissions guidelines as implemented by the state. The rules require state plans to be submitted by March 21, 2012 for CISWI units other than incinerator units (e.g., waste-burning kilns) that commenced construction on or before June 4, 2010. The compliance deadline is three years after the effective date of EPA's approval of the state plan, but no later than March 21, 2016. Florida has not yet incorporated the revised emissions guidelines into its rules. For these waste-burning kilns, the standards in Table 8 of Subpart DDDD will apply once Florida adopts the rule and puts in place the approved plan or delegation. Currently, there is no mechanism for applicability of the 2011 version of Subpart DDDD in Florida for waste-burning kilns or a deadline for compliance with the applicable requirements under Subpart DDDD for waste-burning kilns. These issued must be resolved when Florida completes rulemaking to implement the 2011 version of Subpart DDDD through a state plan approved by EPA or direct delegation from EPA.

Vacatur of the CISWI Definitions Rule

A federal Court vacated EPA's CISWI Definitions Rule and remanded it to EPA for new rulemaking that would identify which secondary materials are nonhazardous ''solid waste'' for purposes of subtitle D (non-hazardous waste) of the RCRA when burned in a combustion unit. See *Federal Register Volume 75, No. 174, Thursday, September 9, 2010, Rules and Regulations and Volume 75, Page 31844, June 4, 2010*.

The revised definitions will determine the applicability of Clean Air Act (CAA) Section 129(a) for any combustion unit that burns any non-hazardous secondary material that is considered to be a solid waste. When EPA developed the NSPS Subpart CCCC and Emissions Guidelines Subpart DDDD provisions, there was no Federal regulatory interpretation of "solid waste" for EPA to apply under Subtitle D of RCRA for purposes of CAA section 112 and 129. During the NSOS rulemaking, EPA did not prejudge the outcome of the recently proposed non-hazardous solid waste rulemaking. EPA therefore did not determine whether or not non-hazardous secondary materials combusted by cement kilns were to be classified as solid wastes. Accordingly, EPA based all NSPS determinations as to source classification on the emissions information that was available at that time, as required by CAA section 112(d)(3). Therefore, the current data base classifies all Portland cement kilns as CAA section 112 sources (*i.e.*, subject regulation under CAA section 112) regardless of the fuel current being fired.

40 CFR 241 - Non-Hazardous Discarded Materials That Are Solid Waste When Used as a Fuel or Ingredient

When EPA updated the CISWI rules (NSPS Subpart CCCC provisions and the Emission Guidelines in Subpart DDDD), it also changed the definition of solid waste used in the rules to conform with the definition of solid waste under the Resource Conservation and Recovery Act (RCRA), "… any distinct operating unit of any commercial or industrial facility that combusts any solid waste as that term is defined in 40 CFR Part 241 [RCRA]..." In 40 CFR 241.3(b), the new RCRA definitions specify that the following non-hazardous secondary materials *are not* solid wastes when combusted:

- Non-hazardous secondary materials used as a fuel in a combustion unit that remain within the control of the generator and that meet the legitimacy criteria specified in paragraph (d)(1) of this section.
- The following non-hazardous secondary materials that *have not been discarded and* meet the legitimacy criteria specified in paragraph (d)(1) of this section when used in a combustion unit (by the generator or outside the control of the generator):
  - Scrap tires used in a combustion unit that are removed from vehicles and managed under the oversight of established tire collection programs.
  - Resinated wood used in a combustion unit (Resinated wood means wood products containing resin adhesives derived from primary and secondary wood products manufacturing such as items as board trim, sander dust, and panel trim).

The "legitimacy criteria" for non-hazardous secondary materials:

- The non-hazardous secondary material must be managed as a valuable commodity based on the following factors:
  - The storage of the non-hazardous secondary material prior to use must not exceed reasonable time frames;
  - Where there is an analogous fuel, the non-hazardous secondary material must be managed in a manner consistent with the analogous fuel or otherwise be adequately contained to prevent releases to the environment;
  - If there is no analogous fuel, the non-hazardous secondary material must be adequately contained so as to prevent releases to the environment;
- The non-hazardous secondary material must have a meaningful heating value and be used as a fuel in a combustion unit that recovers energy.
- The non-hazardous secondary material must contain contaminants at levels comparable in concentration to or lower than those in traditional fuels which the combustion unit is designed to burn. Such comparison is to be based on a direct comparison of the contaminant levels in the non-hazardous secondary material to the traditional fuel itself.

Although the Florida has not yet adopted these federal definitions, the alternative fuels requested by SAC appear to meet the legitimacy criteria by being managed as a valuable commodity (i.e., fuel), having a useful heating value (displaces coal as a pre-calciner fuel) and containing contaminants comparable to traditional fuels (e.g., coal).

<u>Reconsideration Action on Cement NESHAP (Excerpts)</u>

When EPA proposed the revised Portland Cement NESHAP, it classified all cement kilns, including those burning secondary materials, as "cement kilns" for the NESHAP rulemaking, and explained why it was doing so. The EPA discussed the interplay between the cement kiln NESHAP and the forthcoming rules for incinerators which burn solid waste, noting that "some Portland cement kilns combust secondary materials as alternative fuels" *(74 FR at 21138).* The EPA then stated that because there was no regulatory definition of solid waste that would distinguish which of these alternative fuels burned by cement kilns were wastes and which were not, the EPA would therefore classify all of the units as cement kilns. *Id.* The EPA reasoned that unless and until the Agency adopts a definition of solid waste classifying the alternative fuels, cement kilns burning secondary materials as fuels or otherwise using secondary materials are lawfully classified as cement kilns and rules for cement kilns therefore would apply to them.

The EPA further found that combustion of secondary materials as alternative fuels by cement kilns "did not have any appreciable effect on the amount of hazardous air pollutants (HAP) emitted by any source." *Id.* The record for the proposed rule included an inventory of every material burned by a large group of cement kilns over a 30-day period, including all of those comprising the pool of best performers for mercury.

A "secondary material" is a material that can potentially be classified as a solid waste under RCRA when recycled *(50 FR 616 n. 4 (Jan. 4, 1985)*. Under the newly adopted regulatory definition of solid waste, secondary materials encompass "any material that is not the primary product of a manufacturing or commercial process, and can include post-consumer material, off-specification commercial chemical products or manufacturing chemical intermediates, post-industrial material, and scrap *(40 CFR section 241.2).*

As noted earlier, all cement kilns certified to EPA that they were cement kilns in compliance with the applicable section 112 (d) standards for cement kilns up to and through the time of the amendments to the Portland Cement NESHAP. Thus, cement kilns burning alternative fuels or other secondary materials were not classified as incinerators during the cement NESHAP rulemaking, but as cement kilns. Therefore, the Portland Cement NESHAP was, and is, based exclusively on the performance of cement kilns, as properly classified at the time of the rulemaking.

NESHAP Subpart LLL in 40 CFR 63 - Portland Cement Manufacturing Industry

This federal MACT applies to all new and existing Portland cement plants at major and area sources. The affected source includes the kiln, which is defined as a device that includes the preheater tower, precalciner and raw mill. The Branford Cement Plant is subject NESHAP Subpart LLL (Portland Cement MACT), which is adopted by reference into Rule 62-204.800, F.A.C. By being subject to Subpart LLL, the kiln is specifically exempt from compliance with the requirements of NSPS Subpart F, Standards of Performance for Portland Cement Plants, in 40 CFR 60.60 – 60.66.

In 2010, EPA revised this federal rule for which the revisions will take effect in 2013. The Portland Cement MACT establishes emission standards that must be met and does not limit the types of non-hazardous materials that can be used as fuels or ingredients in the kiln. It does not prohibit the use of non-hazardous discarded materials, municipal solid waste, refuse-derived waste, or any other form of solid waste as a fuel. The MACT standards specify the following HAP emissions standards applicable to the Branford Cement Plant:

- Mercury: 55 lb/million tons of clinker produced
- PM: 0.04 lb/ton clinker(as a surrogate for metals such as cadmium and lead)
- THC: 24 ppmv (as a surrogate for other organic HAP emissions)
- HCl: 3 ppmv

Compliance with the new standards requires continuous monitoring methods. Although this NESHAP is final, EPA is currently reconsidering portions and it will likely be challenged by industry as well as environmental groups.

Identification of Non-Hazardous Materials That Are Not Solid Waste – State Regulations

According to 403.7045(1)(f), F.S., the following are considered "industrial byproducts" and not solid wastes, if:

- A majority of the industrial byproducts are demonstrated to be sold, used, or reused within one year.
- The industrial byproducts are not discharged, deposited, injected, dumped, spilled, leaked, or placed upon any land or water so that such industrial byproducts, or any constituent thereof, may enter other lands or be emitted into the air or discharged into any waters, including groundwater, or otherwise enter the environment such that a threat of contamination in excess of applicable department standards and criteria or a significant threat to public health is caused.
- The industrial byproducts are not hazardous wastes as defined under 403.703, F.S. and rules adopted under this section.

Based on this rationale, the proposed alternative fuel materials are industrial byproducts or have specific exemptions from solid waste permitting. Non-chlorinated plastics and agricultural fibrous organic byproducts have agricultural exemptions from solid waste rules. Reject roofing shingles and used roofing shingle scraps include raw material needed by the cement kiln. Tire-derived fuel has exemptions from solid waste permitting. Clean woody biomass is exempt from solid waste permitting. Pre-consumer reject paper, post-consumer paper carpet-derived fuel, a blended mix of the above alternative fuels and an engineered fuel are considered industrial byproducts, which are not solid wastes.

Removing Test Requirements

- The requirement for metals stack testing was removed because current information indicates that metals in the alternative fuels will be comparable to or less than coal.
- The analytical data obtained from the samples of non-chlorinated agricultural plastics show no detectable pesticides or very low levels. This is likely because newer pesticides are biodegradable and quickly break down after use. The long residence time at high temperatures will destroy any pesticide residue. Due to the very low levels present, the requirement for stack testing was removed.

- The permit initially required HCL and D/F testing if the chlorine content of the alternative fuels was more than 0.2%, but there is additional information supporting the effective scrubbing of HCl emissions by the limestone and that D/F are be destroyed high temperatures above 1400° F and are not reformed if rapidly cooled and maintained below 400° F [7]. A study, Air Emissions Data Summary for Portland Cement Pyroprocessing Operations, Portland Cement Association, 2008[8], shows D/F emissions are related to the type of kiln. In response to the 2002 MACT standards, the cement kilns conducted D/F emission tests, and many kiln operators learned to reduce the inlet temperature to the air pollution control systems to suppress formation of D/F compounds. Due to this change in operating conditions, D/F emissions in the cement industry have decreased significantly since the 2002 compliance date of the MACT standard for kilns subject to Subpart LLL. The preheater/precalciner kiln design for SAC provides this cooling and the plant continuously monitors the temperature to the baghouse inlet as an indicator of effective D/F control.
- The requirement for demonstrating that used roofing shingle scraps do not contain asbestos has been changed to refer to the requirements in Subpart M of 40 CFR 61. Previously the permit required determination by the polarized light microscopy (PLM) method, but any appropriate method specified in Subpart M of 40 CFR 61 is acceptable.

Removing PSD Reporting

The initial permit required annual reporting of emissions pursuant to Rules 62-212.300(1)(e) and 62-210.370, F.A.C. However, this requirement only applies when a facility makes a permanent physical change or change in the method of operation. Reporting must occur for the first full year of operation after making the change. Since this permit only authorizes a short-term, limited, temporary trial this reporting cannot be done. However, the permit does require a report on emissions from the trial burn and the current Title V air operation permit requires submittal of an Annual Operating Report of the annual emissions from the kiln.

4. CONCLUSION

The short-term trial burns will allow the plant to determine whether it is feasible to handle and fire each alternative fuel material and to develop QA/QC procedures for receiving, handling and firing each alternative fuel material. The alternative fuels are limited in amounts and each will be fired over a maximum of 90 operational days. Actual emissions from firing the alternative fuels must comply with all existing valid permit limits and are not expected to increase significantly above the current emission levels. Based on reasonable assurance provided by the applicant, the project:

- Will not result in significant emissions increases requiring PSD preconstruction review, and
- Will not violate the terms and conditions of the current Title V air operation permit.

A revised draft permit will be issued to authorize and regulate the short-term trials of alternative fuel materials.

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 draft permit. No air quality modeling analysis is required because the project does not result in a significant increase in emissions. Christy DeVore, project engineer, reviewed the application and prepared the draft permit documents. Jeff Koerner, program administrator, provided technical input for the project and assisted in editing the draft permit documents. 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.

[7] EPA Course No. Re-100, "Basic Concepts in Environmental Sciences"; Module 6: Air Pollutants and Control Techniques - Dioxins and Furans; http://www.epa.gov/apti/bces/index.htm.

[8] "Air Emissions Data Summary for Portland Cement Pyroprocessing Operations", Richards, John; Goshaw, David; and Holder, Tom, Portland Cement Association, PCD R&D SN3048, 2008.