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BUREAU OF
AIR REGULATION

Department of Environmental Protection

Division of Air Resource Management

APPLICATION FOR AIR PERMIT - LONG FORM

I. APPLICATION INFORMATION

Air Construction Permit – Use this form to apply for an air construction permit:

- For any required purpose at a facility operating under a federally enforceable state air operation permit (FESOP) or Title V air operation permit;
- For a proposed project subject to prevention of significant deterioration (PSD) review, nonattainment new source review, or maximum achievable control technology (MACT);
- To assume a restriction on the potential emissions of one or more pollutants to escape a requirement such as PSD review, nonattainment new source review, MACT, or Title V; or
- To establish, revise, or renew a plantwide applicability limit (PAL).

Air Operation Permit – Use this form to apply for:

- An initial federally enforceable state air operation permit (FESOP); or
- An initial, revised, or renewal Title V air operation permit.

To ensure accuracy, please see form instructions.

Identification of Facility

1. Facility Owner/Company Name: **Tarmac America, LLC**	
2. Site Name: **Pennsuco Complex**	
3. Facility Identification Number: **0250020**	
4. Facility Location... Street Address or Other Locator: **11000 NW 121 Way** City: **Medley** County: **Miami-Dade** Zip Code: **33178**	
5. Relocatable Facility? ☐ Yes ☒ No	6. Existing Title V Permitted Facility? ☒ Yes ☐ No

Application Contact

1. Application Contact Name: **Max Lee**
2. Application Contact Mailing Address... Organization/Firm: **Koogler and Associates, Inc** Street Address: **4014 NW 13th Street** City: **Gainesville** State: **Florida** Zip Code: **32609**
3. Application Contact Telephone Numbers... Telephone: **(352) 377 - 5822** ext. **13** Fax: **(352) 377 - 7158**
4. Application Contact E-mail Address: **mlee@kooglerassociates.com**

Application Processing Information (DEP Use)

1. Date of Receipt of Application: 4/20/11	3. PSD Number (if applicable):
2. Project Number(s): 0250020-091-AC	4. Siting Number (if applicable):

APPLICATION INFORMATION

Purpose of Application

This application for air permit is being submitted to obtain: (Check one)

Air Construction Permit

[x] Air construction permit.

[ ] Air construction permit to establish, revise, or renew a plantwide applicability limit (PAL).

[ ] Air construction permit to establish, revise, or renew a plantwide applicability limit (PAL), and separate air construction permit to authorize construction or modification of one or more emissions units covered by the PAL.

Air Operation Permit

[ ] Initial Title V air operation permit.

[ ] Title V air operation permit revision.

[ ] Title V air operation permit renewal.

[ ] Initial federally enforceable state air operation permit (FESOP) where professional engineer (PE) certification is required.

[ ] Initial federally enforceable state air operation permit (FESOP) where professional engineer (PE) certification is not required.

Air Construction Permit and Revised/Renewal Title V Air Operation Permit (Concurrent Processing)

[ ] Air construction permit and Title V permit revision, incorporating the proposed project.

[ ] Air construction permit and Title V permit renewal, incorporating the proposed project.

Note: By checking one of the above two boxes, you, the applicant, are requesting concurrent processing pursuant to Rule 62-213.405, F.A.C. In such case, you must also check the following box:

[ ] I hereby request that the department waive the processing time requirements of the air construction permit to accommodate the processing time frames of the Title V air operation permit.

Application Comment

Application is for addition of allowed fuel types for transport on-site, storage, and injection into the kiln system. On-site processing of materials is requested.

The regulatory analysis and the project description are detailed in Appendix 1.

APPLICATION INFORMATION

Scope of Application

Emissions Unit ID Number	Description of Emissions Unit	Air Permit Type	Air Permit Processing Fee
EU028	Cement Plant Pyroprocessing and Raw Mill System	NA	NA

Application Processing Fee

Check one: ☐ Attached - Amount: $_____ ☒ Not Applicable

TARMAC AMERICA LLC

WRITTEN CONSENT OF THE SOLE MEMBER

January 3, 2011

The undersigned, being the sole Member of Tarmac America LLC (the "Company"), hereby consents to the adoption of the following resolution in lieu of formal meeting pursuant to the laws of the State of Delaware, as amended from time to time:

RESOLVED, that all of the previously existing officers have either resigned, or are hereby removed from office and the following individuals are hereby appointed officers of this Company effective January 3, 2011, to serve in such office at the pleasure of the sole member of the Company until the earlier resignation, retirement, or removal from such office:

OFFICERS	TITLE OF OFFICE
Aris Papadopoulos	Chief Executive Officer
J. Patrick Borders	President
Timothy Kuebler	Senior Vice President, Cement & Aggregate
John Malcolm	Vice President, Concrete Products
Daniel Crowley	Vice President, General Plant Manager Cement & Aggregates
Russell A. Fink	Vice President, General Counsel and Secretary
Lawrence H. Wilt, Jr.	Vice President and Chief Financial Officer
Graham K. Fox	Vice President, Information Systems
Robert M. Thomas	Vice President, Human Resources & Organizational Development
Karen V. Fittler	Director of Tax
Stephen Marinaccio	Director of Finance
Burks Slusher	Controller
Jennifer M. Rafferty	Assistant Secretary
Porter Hardy, IV	Assistant Secretary

IN WITNESS WHEREOF, the undersigned has executed this Written Consent effective as of the date first above written.

TITAN AMERICA LLC

by _____

Russell A. Fink, Vice President
General Counsel and Secretary

TARMAC AMERICA LLC

CERTIFICATE OF SECRETARY

I, Russell A. Fink, Vice President, General Counsel and Secretary of Tarmac America LLC, a limited liability company duly organized and existing under the laws of the State of Delaware (the "Company"), do hereby certify that:

Attached hereto, initialed on each page thereof by the Secretary of said Company for identification, is a true, correct and complete copy of the resolution adopted by the Sole Member of the Company on January 3, 2011 appointing officers of the Company; that such resolution and adoption thereof are consistent with the laws of said State, and with the Certificate of Formation and the Limited Liability Company Agreement of said Company; and that such resolution has not been amended or rescinded and remains in full force and effect.

IN WITNESS WHEREOF, the undersigned has executed this Certificate as of January 17, 2011.

Russell A. Fink, Vice President
General Counsel and Secretary

Tarmac®
A Titan America Business

Tarmac America LLC
455 Fairway Drive
Deerfield Beach, FL 33441
(954) 481-2800
Fax (954) 421-0296
www.titanamerica.com

January 28, 2011

State of Florida Department of Environmental Protection
And/or All Other Federal, State, County or City
Agencies Within Florida

RE: **Letter of Authorization**

Dear Sir/Madam

This letter authorizes the signature of Mr. Albert Townsend, Director of Alternative Fuels for Tarmac America LLC for purposes of site plan, building permit applications, modifications, renewals and governmental matters for facilities operated or controlled by Titan America, LLC or Tarmac America, LLC.

Yours very truly,

J. Patrick Borders
President

APPLICATION INFORMATION

Owner/Authorized Representative Statement

Complete if applying for an air construction permit or an initial FESOP.

1. Owner/Authorized Representative Name : **Al Townsend**

2. Owner/Authorized Representative Mailing Address...
   Organization/Firm: **Tarmac America, LLC**
   Street Address: **455 Fairway Drive, Suite 200**
   City: **Deerfield Beach** State: **Florida** Zip Code: **33441**

3. Owner/Authorized Representative Telephone Numbers...
   Telephone: **(954) 224-9488** ext. Fax: **(954) 480 - 9352**

4. Owner/Authorized Representative E-mail Address: **Atownsend@titanamerica.com**

5. Owner/Authorized Representative Statement:

   I, the undersigned, am the owner or authorized representative of the corporation, partnership, or other legal entity submitting this air permit application. To the best of my knowledge, the statements made in this application are true, accurate and complete, and any estimates of emissions reported in this application are based upon reasonable techniques for calculating emissions. I understand that a permit, if granted by the department, cannot be transferred without authorization from the department.

   Signature

   4-19-11
   Date

APPLICATION INFORMATION

Application Responsible Official Certification

Complete if applying for an initial, revised, or renewal Title V air operation permit or concurrent processing of an air construction permit and revised or renewal Title V air operation permit. If there are multiple responsible officials, the "application responsible official" need not be the "primary responsible official."

1. Application Responsible Official Name: **not applicable**

2. Application Responsible Official Qualification (Check one or more of the following options, as applicable):

- [x] For a corporation, the president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy or decision-making functions for the corporation, or a duly authorized representative of such person if the representative is responsible for the overall operation of one or more manufacturing, production, or operating facilities applying for or subject to a permit under Chapter 62-213, F.A.C.
- [ ] For a partnership or sole proprietorship, a general partner or the proprietor, respectively.
- [ ] For a municipality, county, state, federal, or other public agency, either a principal executive officer or ranking elected official.
- [ ] The designated representative at an Acid Rain source or CAIR source.

3. Application Responsible Official Mailing Address...
Organization/Firm: **Tarmac America, LLC**
Street Address: **455 Fairway Drive, Suite 200**
City: **Deerfield Beach** State: **Florida** Zip Code: **33441**

4. Application Responsible Official Telephone Numbers...
Telephone: **(954) 224-9488** ext. Fax: **(954) 480 - 9352**

5. Application Responsible Official E-mail Address:

6. Application Responsible Official Certification:

I, the undersigned, am a responsible official of the Title V source addressed in this air permit application. I hereby certify, based on information and belief formed after reasonable inquiry, that the statements made in this application are true, accurate and complete and that, to the best of my knowledge, any estimates of emissions reported in this application are based upon reasonable techniques for calculating emissions. The air pollutant emissions units and air pollution control equipment described in this application will be operated and maintained so as to comply with all applicable standards for control of air pollutant emissions found in the statutes of the State of Florida and rules of the Department of Environmental Protection and revisions thereof and all other applicable requirements identified in this application to which the Title V source is subject. I understand that a permit, if granted by the department, cannot be transferred without authorization from the department, and I will promptly notify the department upon sale or legal transfer of the facility or any permitted emissions unit. Finally, I certify that the facility and each emissions unit are in compliance with all applicable requirements to which they are subject, except as identified in compliance plan(s) submitted with this application.

Signature

4-19-11
Date

APPLICATION INFORMATION

Professional Engineer Certification

1. Professional Engineer Name: **Max Lee, Ph.D., P.E.**
   Registration Number: **58091**
2. Professional Engineer Mailing Address...
   Organization/Firm: **Koogler and Associates, Inc**
   Street Address: **4014 NW 13th Street**
   City: **Gainesville** State: **Florida** Zip Code: **32609**
3. Professional Engineer Telephone Numbers...
   Telephone: **(352) 377 - 5822** ext. **13** Fax: **(352) 377 - 7158**
4. Professional Engineer E-mail Address: **mlee@kooglerassociates.com**
5. Professional Engineer Statement:

I, the undersigned, hereby certify, except as particularly noted herein, that:*

(1) To the best of my knowledge, there is reasonable assurance that the air pollutant emissions unit(s) and the air pollution control equipment described in this application for air permit, when properly operated and maintained, will comply with all applicable standards for control of air pollutant emissions found in the Florida Statutes and rules of the Department of Environmental Protection; and

(2) To the best of my knowledge, any emission estimates reported or relied on in this application are true, accurate, and complete and are either based upon reasonable techniques available for calculating emissions or, for emission estimates of hazardous air pollutants not regulated for an emissions unit addressed in this application, based solely upon the materials, information and calculations submitted with this application.

(3) If the purpose of this application is to obtain a Title V air operation permit (check here ☐, if so), I further certify that each emissions unit described in this application for air permit, when properly operated and maintained, will comply with the applicable requirements identified in this application to which the unit is subject, except those emissions units for which a compliance plan and schedule is submitted with this application.

(4) If the purpose of this application is to obtain an air construction permit (check here ☒, if so) or concurrently process and obtain an air construction permit and a Title V air operation permit revision or renewal for one or more proposed new or modified emissions units (check here ☐, if so), I further certify that the engineering features of each such emissions unit described in this application have been designed or examined by me or individuals under my direct supervision and found to be in conformity with sound engineering principles applicable to the control of emissions of the air pollutants characterized in this application.

(5) If the purpose of this application is to obtain an initial air operation permit or operation permit revision or renewal for one or more newly constructed or modified emissions units (check here , if so), I further certify that, with the exception of any changes detailed as part of this application, each such emissions unit has been constructed or modified in substantial accordance with the information given in the corresponding application for air construction permit and with all provisions contained in such permit.

Signature 4/18/11
Date

(seal)

* Attach any exception to certification statement.

II. FACILITY INFORMATION

A. GENERAL FACILITY INFORMATION

Facility Location and Type

1. Facility UTM Coordinates... Zone East (km) **562.27** North (km) **2861.7**		2. Facility Latitude/Longitude... Latitude (DD/MM/SS) **25°52'26" N** Longitude (DD/MM/SS) **80°22'20" W**	
3. Governmental Facility Code: **0**	4. Facility Status Code: **A**	5. Facility Major Group SIC Code: **32**	6. Facility SIC(s): **3241**
7. Facility Comment :			

Facility Contact

1. Facility Contact Name: **Al Townsend**
2. Facility Contact Mailing Address... Organization/Firm: **Tarmac America, LLC** Street Address: **455 Fairway Drive, Suite 200** City: **Deerfield Beach** State: **Florida** Zip Code: **33441**
3. Facility Contact Telephone Numbers: Telephone: **(954) 224-9488** ext. Fax: **(954) 480 - 9352**
4. Facility Contact E-mail Address: **Atownsend@titanamerica.com**

Facility Primary Responsible Official

Complete if an "application responsible official" is identified in Section I that is not the facility "primary responsible official."

1. Facility Primary Responsible Official Name: **not applicable**
2. Facility Primary Responsible Official Mailing Address... Organization/Firm: Street Address: City: State: Zip Code:
3. Facility Primary Responsible Official Telephone Numbers... Telephone: ( ) - ext. Fax: ( ) -
4. Facility Primary Responsible Official E-mail Address:

FACILITY INFORMATION

Facility Regulatory Classifications

Check all that would apply *following* completion of all projects and implementation of all other changes proposed in this application for air permit. Refer to instructions to distinguish between a "major source" and a "synthetic minor source."

1. ☐ Small Business Stationary Source	☐ Unknown
2. ☐ Synthetic Non-Title V Source	
3. ☒ Title V Source	
4. ☒ Major Source of Air Pollutants, Other than Hazardous Air Pollutants (HAPs)	
5. ☐ Synthetic Minor Source of Air Pollutants, Other than HAPs	
6. ☒ Major Source of Hazardous Air Pollutants (HAPs)	
7. ☐ Synthetic Minor Source of HAPs	
8. ☒ One or More Emissions Units Subject to NSPS (40 CFR Part 60)	
9. ☐ One or More Emissions Units Subject to Emission Guidelines (40 CFR Part 60)	
10. ☒ One or More Emissions Units Subject to NESHAP (40 CFR Part 61 or Part 63)	
11. ☐ Title V Source Solely by EPA Designation (40 CFR 70.3(a)(5))	
12. Facility Regulatory Classifications Comment: **The Cement Plant is subject to;** **40 CFR 60 Subpart F: Standards of Performance for Portland Cement Plants (superceded by 40 CFR 63, Subpart LLL);** **40 CFR 60, Subpart Y: Standards of Performance for Coal Preparation Plants; and** **40 CFR 63 Subpart LLL: National Emission Standards for Hazardous Air Pollutants from the Portland Cement Industry.**	

FACILITY INFORMATION

List of Pollutants Emitted by Facility

1. Pollutant Emitted	2. Pollutant Classification	3. Emissions Cap [Y or N]?
NOX	**A**	
SO2	**A**	
CO	**A**	
PM	**A**	
VOC	**A**	
PM10	**A**	
PM2.5	**A**	
HAPS	**A**	
D/F	**C**	
H114	**C**	
PB	**B**	
H106	**C**	

B. EMISSIONS CAPS

Facility-Wide or Multi-Unit Emissions Caps

1. Pollutant Subject to Emissions Cap	2. Facility-Wide Cap [Y or N]? (all units)	3. Emissions Unit ID's Under Cap (if not all units)	4. Hourly Cap (lb/hr)	5. Annual Cap (ton/yr)	6. Basis for Emissions Cap

7. Facility-Wide or Multi-Unit Emissions Cap Comment:

C. FACILITY ADDITIONAL INFORMATION

Additional Requirements for All Applications, Except as Otherwise Stated

1.	Facility Plot Plan: (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought) ☐ Attached, Document ID:_____ ☒ Previously Submitted, Date:_____
2.	Process Flow Diagram(s): (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought) ☐ Attached, Document ID:_____ ☒ Previously Submitted, Date:_____
3.	Precautions to Prevent Emissions of Unconfined Particulate Matter: (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought) ☐ Attached, Document ID:_____ ☒ Previously Submitted, Date:_____

Additional Requirements for Air Construction Permit Applications

1.	Area Map Showing Facility Location: ☐ Attached, Document ID:_____ ☒ Not Applicable (existing permitted facility)
2.	Description of Proposed Construction, Modification, or Plantwide Applicability Limit (PAL): ☒ Attached, Document ID: 1
3.	Rule Applicability Analysis: ☒ Attached, Document ID: 1
4.	List of Exempt Emissions Units: ☐ Attached, Document ID:_____ ☒ Not Applicable (no exempt units at facility)
5.	Fugitive Emissions Identification: ☒ Attached, Document ID: 1 ☐ Not Applicable
6.	Air Quality Analysis (Rule 62-212.400(7), F.A.C.): ☐ Attached, Document ID:_____ ☒ Not Applicable
7.	Source Impact Analysis (Rule 62-212.400(5), F.A.C.): ☐ Attached, Document ID:_____ ☒ Not Applicable
8.	Air Quality Impact since 1977 (Rule 62-212.400(4)(e), F.A.C.): ☐ Attached, Document ID:_____ ☒ Not Applicable
9.	Additional Impact Analyses (Rules 62-212.400(8) and 62-212.500(4)(e), F.A.C.): ☐ Attached, Document ID:_____ ☒ Not Applicable
10.	Alternative Analysis Requirement (Rule 62-212.500(4)(g), F.A.C.): ☐ Attached, Document ID:_____ ☒ Not Applicable

C. FACILITY ADDITIONAL INFORMATION (CONTINUED)

Additional Requirements for FESOP Applications - NA

1. List of Exempt Emissions Units:
   ☐ Attached, Document ID:_____ ☐ Not Applicable (no exempt units at facility)

Additional Requirements for Title V Air Operation Permit Applications - NA

1. List of Insignificant Activities: (Required for initial/renewal applications only)
   ☐ Attached, Document ID:_____ ☐ Not Applicable (revision application)

2. Identification of Applicable Requirements: (Required for initial/renewal applications, and for revision applications if this information would be changed as a result of the revision being sought)
   ☐ Attached, Document ID:_____
   ☐ Not Applicable (revision application with no change in applicable requirements)

3. Compliance Report and Plan: (Required for all initial/revision/renewal applications)
   ☐ Attached, Document ID:_____
   Note: A compliance plan must be submitted for each emissions unit that is not in compliance with all applicable requirements at the time of application and/or at any time during application processing. The department must be notified of any changes in compliance status during application processing.

4. List of Equipment/Activities Regulated under Title VI: (If applicable, required for initial/renewal applications only)
   ☐ Attached, Document ID:_____
   ☐ Equipment/Activities Onsite but Not Required to be Individually Listed
   ☐ Not Applicable

5. Verification of Risk Management Plan Submission to EPA: (If applicable, required for initial/renewal applications only)
   ☐ Attached, Document ID:_____ ☐ Not Applicable

6. Requested Changes to Current Title V Air Operation Permit:
   ☐ Attached, Document ID:_____ ☐ Not Applicable

C. FACILITY ADDITIONAL INFORMATION (CONTINUED)

Additional Requirements for Facilities Subject to Acid Rain, CAIR, or Hg Budget Program

1. Acid Rain Program Forms:

   Acid Rain Part Application (DEP Form No. 62-210.900(1)(a)):
   ☐ Attached, Document ID:_____ ☐ Previously Submitted, Date:_____
   ☒ Not Applicable (not an Acid Rain source)

   Phase II NO_X Averaging Plan (DEP Form No. 62-210.900(1)(a)1.):
   ☐ Attached, Document ID:_____ ☐ Previously Submitted, Date:_____
   ☒ Not Applicable

   New Unit Exemption (DEP Form No. 62-210.900(1)(a)2.):
   ☐ Attached, Document ID:_____ ☐ Previously Submitted, Date:_____
   ☒ Not Applicable

2. CAIR Part (DEP Form No. 62-210.900(1)(b)):
   ☐ Attached, Document ID:_____ ☐ Previously Submitted, Date:_____
   ☒ Not Applicable (not a CAIR source)

Additional Requirements Comment

III. EMISSIONS UNIT INFORMATION

Title V Air Operation Permit Application - For Title V air operation permitting only, emissions units are classified as regulated, unregulated, or insignificant. If this is an application for an initial, revised or renewal Title V air operation permit, a separate Emissions Unit Information Section (including subsections A through I as required) must be completed for each regulated and unregulated emissions unit addressed in this application. Some of the subsections comprising the Emissions Unit Information Section of the form are optional for unregulated emissions units. Each such subsection is appropriately marked. Insignificant emissions units are required to be listed at Section II, Subsection C.

Air Construction Permit or FESOP Application - For air construction permitting or federally enforceable state air operation permitting, emissions units are classified as either subject to air permitting or exempt from air permitting. The concept of an "unregulated emissions unit" does not apply. If this is an application for an air construction permit or FESOP, a separate Emissions Unit Information Section (including subsections A through I as required) must be completed for each emissions unit subject to air permitting addressed in this application for air permit. Emissions units exempt from air permitting are required to be listed at Section II, Subsection C.

Air Construction Permit and Revised/Renewal Title V Air Operation Permit Application – Where this application is used to apply for both an air construction permit and a revised or renewal Title V air operation permit, each emissions unit is classified as either subject to air permitting or exempt from air permitting for air construction permitting purposes, and as regulated, unregulated, or insignificant for Title V air operation permitting purposes. A separate Emissions Unit Information Section (including subsections A through I as required) must be completed for each emissions unit addressed in this application that is subject to air construction permitting and for each such emissions unit that is a regulated or unregulated unit for purposes of Title V permitting. (An emissions unit may be exempt from air construction permitting but still be classified as an unregulated unit for Title V purposes.) Emissions units classified as insignificant for Title V purposes are required to be listed at Section II, Subsection C.

If submitting the application form in hard copy, the number of this Emissions Unit Information Section and the total number of Emissions Unit Information Sections submitted as part of this application must be indicated in the space provided at the top of each page.

EMISSIONS UNIT INFORMATION
Section [1] of [1]

A. GENERAL EMISSIONS UNIT INFORMATION

Title V Air Operation Permit Emissions Unit Classification

1. Regulated or Unregulated Emissions Unit? (Check one, if applying for an initial, revised or renewal Title V air operation permit. Skip this item if applying for an air construction permit or FESOP only.)

☐ The emissions unit addressed in this Emissions Unit Information Section is a regulated emissions unit.

☐ The emissions unit addressed in this Emissions Unit Information Section is an unregulated emissions unit.

Emissions Unit Description and Status

1. Type of Emissions Unit Addressed in this Section: (Check one)

☒ This Emissions Unit Information Section addresses, as a single emissions unit, a single process or production unit, or activity, which produces one or more air pollutants and which has at least one definable emission point (stack or vent).

☐ This Emissions Unit Information Section addresses, as a single emissions unit, a group of process or production units and activities which has at least one definable emission point (stack or vent) but may also produce fugitive emissions.

☐ This Emissions Unit Information Section addresses, as a single emissions unit, one or more process or production units and activities which produce fugitive emissions only.

2. Description of Emissions Unit Addressed in this Section:
Cement Plant Pyroprocessing and Raw Mill System

3. Emissions Unit Identification Number: **028**

4. Emissions Unit Status Code: **A**	5. Commence Construction Date:	6. Initial Startup Date: **June 30, 2004**	7. Emissions Unit Major Group SIC Code: **32**

8. Federal Program Applicability: (Check all that apply)

☐ Acid Rain Unit

☐ CAIR Unit

9. Package Unit:
Manufacturer: Model Number:

10. Generator Nameplate Rating: MW

11. Emissions Unit Comment:
Includes In Line Kiln/Raw Mill, 4-Raw Mill Cyclone Separators, Controlled Feed Blend Silo, Preheater/Calciner tower, Kiln Dust Bin and Clinker Cooler

EMISSIONS UNIT INFORMATION
Section [1] of [1]

Emissions Unit Control Equipment/Method: Control 1 of 2

1. Control Equipment/Method Description: **Fabric Filter High Temperature**
2. Control Device or Method Code: **016**

Emissions Unit Control Equipment/Method: Control 2 of 2

1. Control Equipment/Method Description: **Fabric Filter Medium Temperature**
2. Control Device or Method Code: **017**

B. EMISSIONS UNIT CAPACITY INFORMATION
(Optional for unregulated emissions units.)

Emissions Unit Operating Capacity and Schedule

1. Maximum Process or Throughput Rate: **2,190,000 TPY**	
2. Maximum Production Rate:	
3. Maximum Heat Input Rate: million Btu/hr	
4. Maximum Incineration Rate: pounds/hr tons/day	
5. Requested Maximum Operating Schedule: hours/day weeks/year	days/week **8760** hours/year
6. Operating Capacity/Schedule Comment: **250 TPH clinker based on a 24-hour block average and 2,190,000 TPY**	

C. EMISSION POINT (STACK/VENT) INFORMATION

(Optional for unregulated emissions units.)

Emission Point Description and Type

1. Identification of Point on Plot Plan or Flow Diagram: **Cement Plant Pyroprocessing and Raw Mill System**		2. Emission Point Type Code: **3**
3. Descriptions of Emission Points Comprising this Emissions Unit for VE Tracking: **351.BF410** **351.BF350** **351.BF440** **351.BF740** **351.BF645** **351.BF200** **351.BF470**		
4. ID Numbers or Descriptions of Emission Units with this Emission Point in Common:		
5. Discharge Type Code: **V**	6. Stack Height: **412** feet	7. Exit Diameter: **14**feet
8. Exit Temperature: **350** °F	9. Actual Volumetric Flow Rate: **620,000** Acfm	10. Water Vapor: **11** %
11. Maximum Dry Standard Flow Rate: **350,000** dscfm		12. Nonstack Emission Point Height: feet
13. Emission Point UTM Coordinates... Zone: East (km): North (km):		14. Emission Point Latitude/Longitude... Latitude (DD/MM/SS) Longitude (DD/MM/SS)
15. Emission Point Comment: **331.BF200 limited to 10%; All others limited to 5% instead of PM testing.**		

D. SEGMENT (PROCESS/FUEL) INFORMATION

Segment Description and Rate: Segment 1 of 2

1. Segment Description (Process/Fuel Type): **Raw Mill**		
2. Source Classification Code (SCC): **30500612**	3. SCC Units: **Tons Raw Material Handled**	
4. Maximum Hourly Rate:	5. Maximum Annual Rate: **2,400,000**	6. Estimated Annual Activity Factor:
7. Maximum % Sulfur:	8. Maximum % Ash:	9. Million Btu per SCC Unit:
10. Segment Comment:		

Segment Description and Rate: Segment 2 of 2

1. Segment Description (Process/Fuel Type): **Clinker Production**		
2. Source Classification Code (SCC): **30500623**	3. SCC Units: **Tons Clinker Produced**	
4. Maximum Hourly Rate:	5. Maximum Annual Rate: **2,190,000**	6. Estimated Annual Activity Factor:
7. Maximum % Sulfur:	8. Maximum % Ash:	9. Million Btu per SCC Unit:
10. Segment Comment: **250 TPH based on a 24-hour block average and 2,190,000 TPY.**		

E. EMISSIONS UNIT POLLUTANTS

List of Pollutants Emitted by Emissions Unit

1. Pollutant Emitted	2. Primary Control Device Code	3. Secondary Control Device Code	4. Pollutant Regulatory Code
CO			
D/F			
H107			
H106			
H114			
HAPS	016		
NOX			
PB			
PM	016		
PM10	016		
SAM			
SO2			
VOC			

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL, FUGITIVE, AND ACTUAL EMISSIONS

(Optional for unregulated emissions units.)

Complete a Subsection F1 for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions

1. Pollutant Emitted: **CO**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **576** lb/hour **2522.88** tons/year	4. Synthetically Limited? ☐ Yes ☒ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: **576 lb/hr, 2.0 lb/ton clinker** Reference: **Permit No. 0250020-026-AV**	7. Emissions Method Code: **1**
8.a. Baseline Actual Emissions (if required): tons/year	8.b. Baseline 24-month Period: From: To:
9.a. Projected Actual Emissions (if required): tons/year	9.b. Projected Monitoring Period: ☐ 5 years ☐ 10 years

10. Calculation of Emissions:
(576 lb/hr) x (8,760 hr/yr) x (ton/2,000 lb) = 2522.88 tons/year

11. Potential, Fugitive, and Actual Emissions Comment:

F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION - ALLOWABLE EMISSIONS

Complete Subsection F2 if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.

Allowable Emissions Allowable Emissions 1 of 1

1. Basis for Allowable Emissions Code: **OTHER**	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units: **2.0 lb/ton clinker (30 day)**	4. Equivalent Allowable Emissions: **576** lb/hour **(24-hr)** tons/year
5. Method of Compliance: **CEM**	
6. Allowable Emissions Comment (Description of Operating Method):	

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL, FUGITIVE, AND ACTUAL EMISSIONS

(Optional for unregulated emissions units.)

Complete a Subsection F1 for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions

1. Pollutant Emitted: **D/F**	2. Total Percent Efficiency of Control:
3. Potential Emissions: lb/hour tons/year	4. Synthetically Limited? ☐ Yes ☒ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: **0.2 ng TEQ/dscm** Reference: **Permit No. 0250020-026-AV**	7. Emissions Method Code: **3A**
8.a. Baseline Actual Emissions (if required): tons/year	8.b. Baseline 24-month Period: From: To:
9.a. Projected Actual Emissions (if required): tons/year	9.b. Projected Monitoring Period: ☐ 5 years ☐ 10 years
10. Calculation of Emissions:	
11. Potential, Fugitive, and Actual Emissions Comment:	

F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION - ALLOWABLE EMISSIONS

Complete Subsection F2 if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.

Allowable Emissions Allowable Emissions 1 of 2

1. Basis for Allowable Emissions Code: **OTHER**	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units: **0.2 ng TEQ/dscm (T>204°C)**	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance: **Method 23 (30 month interval per NESHAP LLL)**	
6. Allowable Emissions Comment (Description of Operating Method):	

Allowable Emissions Allowable Emissions 2 of 2

1. Basis for Allowable Emissions Code: **OTHER**	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units: **0.4 ng TEQ/dscm (T<204°C)**	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance: **Method 23 (30 month interval per NESHAP LLL)**	
6. Allowable Emissions Comment (Description of Operating Method):	

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL, FUGITIVE, AND ACTUAL EMISSIONS

(Optional for unregulated emissions units.)

Complete a Subsection F1 for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions

1. Pollutant Emitted: **H106**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **1.847** lb/hour **3.00** tons/year	4. Synthetically Limited? ☐ Yes ☒ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: **1.847 lb/hr** Reference: **2010 stack test data**	7. Emissions Method Code: **3A**
8.a. Baseline Actual Emissions (if required): tons/year	8.b. Baseline 24-month Period: From: To:
9.a. Projected Actual Emissions (if required): tons/year	9.b. Projected Monitoring Period: ☐ 5 years ☐ 10 years
10. Calculation of Emissions:	
11. Potential, Fugitive, and Actual Emissions Comment:	

F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION - ALLOWABLE EMISSIONS

Complete Subsection F2 if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.

No pollutant allowable emissions information submitted.

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL, FUGITIVE, AND ACTUAL EMISSIONS

(Optional for unregulated emissions units.)

Complete a Subsection F1 for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions

1. Pollutant Emitted: **H114**	2. Total Percent Efficiency of Control:
3. Potential Emissions: lb/hour **0.1145** tons/year	4. Synthetically Limited? ☐ Yes ☒ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: **229 lb/year** Reference: **Permit No. 0250020-026-AV**	7. Emissions Method Code: **2**
8.a. Baseline Actual Emissions (if required): tons/year	8.b. Baseline 24-month Period: From: To:
9.a. Projected Actual Emissions (if required): tons/year	9.b. Projected Monitoring Period: ☐ 5 years ☐ 10 years
10. Calculation of Emissions: **(229 lb/yr) x (ton/2000 lb) = 0.1145 ton/yr**	
11. Potential, Fugitive, and Actual Emissions Comment:	

F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION - ALLOWABLE EMISSIONS

Complete Subsection F2 if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.

Allowable Emissions Allowable Emissions **1** of **2**

1. Basis for Allowable Emissions Code: **OTHER**	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units:	4. Equivalent Allowable Emissions: lb/hour tons/year
5. Method of Compliance: **Material balance**	
6. Allowable Emissions Comment (Description of Operating Method): **Based on Permit No. 0250020-026-AV: 229 lb/yr (averaging time 12 months)**	

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL, FUGITIVE, AND ACTUAL EMISSIONS

(Optional for unregulated emissions units.)

Complete a Subsection F1 for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions

1. Pollutant Emitted: **HAPS**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **40.7** lb/hour **178** tons/year	4. Synthetically Limited? ☐ Yes ☒ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: Reference:	7. Emissions Method Code: **3B**
8.a. Baseline Actual Emissions (if required): tons/year	8.b. Baseline 24-month Period: From: To:
9.a. Projected Actual Emissions (if required): tons/year	9.b. Projected Monitoring Period: ☐ 5 years ☐ 10 years
10. Calculation of Emissions: **(40.7 lb/hr) x (8760 hr/yr) x (ton/2000 lb) = 178.266 ton/yr**	
11. Potential, Fugitive, and Actual Emissions Comment:	

F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION - ALLOWABLE EMISSIONS

Complete Subsection F2 if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.

No pollutant allowable emissions information submitted.

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL, FUGITIVE, AND ACTUAL EMISSIONS

(Optional for unregulated emissions units.)

Complete a Subsection F1 for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions

1. Pollutant Emitted: **NOX**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **720** lb/hour **2376** tons/year	4. Synthetically Limited? ☐ Yes ☒ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: **2.17 lb/ton clinker** Reference: **Permit No. 0250020-026-AV**	7. Emissions Method Code: **1**
8.a. Baseline Actual Emissions (if required): tons/year	8.b. Baseline 24-month Period: From: To:
9.a. Projected Actual Emissions (if required): tons/year	9.b. Projected Monitoring Period: ☐ 5 years ☐ 10 years
10. Calculation of Emissions: **(2.17 lb/ton clinker) x (2,190,000 ton clinker/yr) x (ton/2000 lb) = 2376 ton/yr**	
11. Potential, Fugitive, and Actual Emissions Comment:	

F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION - ALLOWABLE EMISSIONS

Complete Subsection F2 if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.

Allowable Emissions Allowable Emissions 1 of 1

1. Basis for Allowable Emissions Code: **OTHER**	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units: **2.17 lb/ton clinker (12-month avg)**	4. Equivalent Allowable Emissions: **720 lb/hour (24-hr)** tons/year
5. Method of Compliance: **CEM**	
6. Allowable Emissions Comment (Description of Operating Method): **Based on Permit No. 0250020-026-AV**	

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL, FUGITIVE, AND ACTUAL EMISSIONS

(Optional for unregulated emissions units.)

Complete a Subsection F1 for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions

1. Pollutant Emitted: **PB**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **0.00207** lb/hour **0.0034** tons/year	4. Synthetically Limited? ☐ Yes ☐ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: see below Reference: **2009 stack test (assume all emissions based on Raw Mill Up)**	7. Emissions Method Code: **3A**
8.a. Baseline Actual Emissions (if required): tons/year	8.b. Baseline 24-month Period: From: To:
9.a. Projected Actual Emissions (if required): tons/year	9.b. Projected Monitoring Period: ☐ 5 years ☐ 10 years

10. Calculation of Emissions:
Stack Test November 2009
2.07E -03 Mill On
6.00E -04 Mill Off
2.07 E-3 lb/hr x 3248 hr/yr/2000 = 0.0034 ton/yr = 7 lb/yr

11. Potential, Fugitive, and Actual Emissions Comment:

F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION - ALLOWABLE EMISSIONS

Complete Subsection F2 if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.

No pollutant allowable emissions information submitted.

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL, FUGITIVE, AND ACTUAL EMISSIONS

(Optional for unregulated emissions units.)

Complete a Subsection F1 for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions

1. Pollutant Emitted: **PM**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **26.8** lb/hour tons/year	4. Synthetically Limited? ☐ Yes ☒ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: **0.063 lb/ton dry kiln feed (3-hr avg)** Reference: **0250020-026-AV**	7. Emissions Method Code: **3A**
8.a. Baseline Actual Emissions (if required): tons/year	8.b. Baseline 24-month Period: From: To:
9.a. Projected Actual Emissions (if required): tons/year	9.b. Projected Monitoring Period: ☐ 5 years ☐ 10 years
10. Calculation of Emissions:	
11. Potential, Fugitive, and Actual Emissions Comment:	

F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION - ALLOWABLE EMISSIONS

Complete Subsection F2 if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.

Allowable Emissions Allowable Emissions 1 of 1

1. Basis for Allowable Emissions Code: **OTHER**	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units: **0.063 lb/ton of dry kiln feed**	4. Equivalent Allowable Emissions: **26.8** lb/hour tons/year
5. Method of Compliance: **Method 5**	
6. Allowable Emissions Comment (Description of Operating Method):	

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL, FUGITIVE, AND ACTUAL EMISSIONS

(Optional for unregulated emissions units.)

Complete a Subsection F1 for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions

1. Pollutant Emitted: **PM10**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **22.5** lb/hour tons/year	4. Synthetically Limited? ☐ Yes ☒ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: **0.053 lb/ton dry kiln feed (3-hr avg)** Reference: **0250020-026-AV**	7. Emissions Method Code: **3A**
8.a. Baseline Actual Emissions (if required): tons/year	8.b. Baseline 24-month Period: From: To:
9.a. Projected Actual Emissions (if required): tons/year	9.b. Projected Monitoring Period: ☐ 5 years ☐ 10 years
10. Calculation of Emissions: **Using Method 5 results, assume all PM equal to PM10**	
11. Potential, Fugitive, and Actual Emissions Comment:	

F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION - ALLOWABLE EMISSIONS

Complete Subsection F2 if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.

Allowable Emissions Allowable Emissions 1 of 1

1. Basis for Allowable Emissions Code: **OTHER**	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units: **0.053 lb/ton of dry kiln feed**	4. Equivalent Allowable Emissions: **22.5** lb/hour tons/year
5. Method of Compliance: **Method 5 (assume all PM equal to PM10)**	
6. Allowable Emissions Comment (Description of Operating Method):	

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL, FUGITIVE, AND ACTUAL EMISSIONS

(Optional for unregulated emissions units.)

Complete a Subsection F1 for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions

1. Pollutant Emitted: **SAM**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **1.14** lb/hour **5.69** tons/year	4. Synthetically Limited? ☐ Yes ☐ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: **1.14 lb/hr** Reference: **2004 stack test data 1.14 lb/hr, 0.0052 lb/ton clinker**	7. Emissions Method Code: **3A**
8.a. Baseline Actual Emissions (if required): tons/year	8.b. Baseline 24-month Period: From: To:
9.a. Projected Actual Emissions (if required): tons/year	9.b. Projected Monitoring Period: ☐ 5 years ☐ 10 years
10. Calculation of Emissions: **0.0052 lb/ton clinker x 2,190,000 ton clinker/yr /2000 = 5.69 ton/yr**	
11. Potential, Fugitive, and Actual Emissions Comment:	

F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION - ALLOWABLE EMISSIONS

Complete Subsection F2 if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.

No pollutant allowable emissions information submitted.

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL, FUGITIVE, AND ACTUAL EMISSIONS

(Optional for unregulated emissions units.)

Complete a Subsection F1 for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions

1. Pollutant Emitted: **SO2**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **320** lb/hour **548** tons/year	4. Synthetically Limited? ☐ Yes ☐ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: **0.50 lb/ton clinker (30-day avg)** Reference: **0250020-026-AV**	7. Emissions Method Code: **1**
8.a. Baseline Actual Emissions (if required): tons/year	8.b. Baseline 24-month Period: From: To:
9.a. Projected Actual Emissions (if required): tons/year	9.b. Projected Monitoring Period: ☐ 5 years ☐ 10 years

10. Calculation of Emissions:
(0.50 lb/ton clinker) x (2,190,000 ton clinker/yr) x (ton/2000 lb) = 548 ton/yr

11. Potential, Fugitive, and Actual Emissions Comment:

F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION - ALLOWABLE EMISSIONS

Complete Subsection F2 if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.

Allowable Emissions Allowable Emissions **1** of **1**

1. Basis for Allowable Emissions Code: **OTHER**	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units: **0.50 lb/ton clinker (30-day avg)**	4. Equivalent Allowable Emissions: **320** lb/hour (24-hr avg) tons/year
5. Method of Compliance: **CEM**	
6. Allowable Emissions Comment (Description of Operating Method): **Based on Permit No. 0250020-026-AV**	

F1. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION – POTENTIAL, FUGITIVE, AND ACTUAL EMISSIONS

(Optional for unregulated emissions units.)

Complete a Subsection F1 for each pollutant identified in Subsection E if applying for an air construction permit or concurrent processing of an air construction permit and a revised or renewal Title V operation permit. Complete for each emissions-limited pollutant identified in Subsection E if applying for an air operation permit.

Potential, Estimated Fugitive, and Baseline & Projected Actual Emissions

1. Pollutant Emitted: **VOC**	2. Total Percent Efficiency of Control:
3. Potential Emissions: **40** lb/hour **175** tons/year	4. Synthetically Limited? ☐ Yes ☐ No
5. Range of Estimated Fugitive Emissions (as applicable): to tons/year	
6. Emission Factor: **0.16 lb/ton clinker (30-day avg)** Reference: **0250020-026-AV**	7. Emissions Method Code: **1**
8.a. Baseline Actual Emissions (if required): tons/year	8.b. Baseline 24-month Period: From: To:
9.a. Projected Actual Emissions (if required): tons/year	9.b. Projected Monitoring Period: ☐ 5 years ☐ 10 years
10. Calculation of Emissions: **(0.16 lb/ton clinker) x (2,190,000 ton clinker/yr) x (ton/2000 lb) = 175 ton/yr**	
11. Potential, Fugitive, and Actual Emissions Comment:	

F2. EMISSIONS UNIT POLLUTANT DETAIL INFORMATION - ALLOWABLE EMISSIONS

Complete Subsection F2 if the pollutant identified in Subsection F1 is or would be subject to a numerical emissions limitation.

Allowable Emissions Allowable Emissions 1 of 1

1. Basis for Allowable Emissions Code: **OTHER**	2. Future Effective Date of Allowable Emissions:
3. Allowable Emissions and Units: **0.16 lb/ton clinker (30-day avg)**	4. Equivalent Allowable Emissions: **40** lb/hour (24-hr avg)
5. Method of Compliance: **CEM**	
6. Allowable Emissions Comment (Description of Operating Method): **Based on Permit No. 0250020-026-AV**	

EMISSIONS UNIT INFORMATION
Section [1] of [1]

G. VISIBLE EMISSIONS INFORMATION

Complete Subsection G if this emissions unit is or would be subject to a unit-specific visible emissions limitation.

Visible Emissions Limitation: Visible Emissions Limitation 1 of 1

1. Visible Emissions Subtype: **VE05**	2. Basis for Allowable Opacity: [x] Rule [ ] Other
3. Allowable Opacity: Normal Conditions: **5** % Exceptional Conditions: % Maximum Period of Excess Opacity Allowed: min/hour	
4. Method of Compliance: **EPA Method 9, Annually**	
5. Visible Emissions Comment: **10% opacity limit per Rule 40 CFR 63.1348 (NESHAP Subpart LLL); however Tarmac America has accepted 5% opacity limitation per Rule 62-297.620(4) in lieu of PM testing requirements.**	

EMISSIONS UNIT INFORMATION
Section [1] of [1]

H. CONTINUOUS MONITOR INFORMATION

Complete Subsection H if this emissions unit is or would be subject to continuous monitoring.

Continuous Monitoring System: Continuous Monitor **1** of **2**

1. Parameter Code: **EM**	2. Pollutant(s): **NOX, SO2, CO, VOC**
3. CMS Requirement:	☐ Rule ☒ Other
4. Monitor Information... Manufacturer: Model Number:	Serial Number:
5. Installation Date:	6. Performance Specification Test Date:
7. Continuous Monitor Comment: **Required to demonstrate compliance with emission limit per Specific Condition B. 9 of Title V Permit No. 0250020-026-AV. Certified per 40 CFR 60 Appendix F.**	

Continuous Monitoring System: Continuous Monitor **2** of **2**

1. Parameter Code: **OTHER**	2. Pollutant(s): **Opacity**
3. CMS Requirement:	☐ Rule ☐ Other
4. Monitor Information... Manufacturer: Model Number:	Serial Number:
5. Installation Date:	6. Performance Specification Test Date:
7. Continuous Monitor Comment:	

EMISSIONS UNIT INFORMATION
Section [1] of [1]

I. EMISSIONS UNIT ADDITIONAL INFORMATION

Additional Requirements for All Applications, Except as Otherwise Stated

1. Process Flow Diagram: (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
   [x] Attached, Document ID: 1 [ ] Previously Submitted, Date _____

2. Fuel Analysis or Specification: (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
   [x] Attached, Document ID: 1 [ ] Previously Submitted, Date _____

3. Detailed Description of Control Equipment: (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
   [ ] Attached, Document ID: ___ [x] Previously Submitted, Date **On File with DEP**

4. Procedures for Startup and Shutdown: (Required for all operation permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
   [ ] Attached, Document ID: _____ [ ] Previously Submitted, Date _____
   [x] Not Applicable (construction application)

5. Operation and Maintenance Plan: (Required for all permit applications, except Title V air operation permit revision applications if this information was submitted to the department within the previous five years and would not be altered as a result of the revision being sought)
   [ ] Attached, Document ID: ___ [x] Previously Submitted, Date **On File with DEP**

6. Compliance Demonstration Reports/Records:
   [ ] Attached, Document ID: _____
   Test Date(s)/Pollutant(s) Tested: _____
   [x] Previously Submitted, Date: **On File with DEP**
   Test Date(s)/Pollutant(s) Tested: **11/9/2010 – 11/16/2010**
   [ ] To be Submitted, Date (if known):_____
   Test Date(s)/Pollutant(s) Tested: _____
   [ ] Not Applicable
   Note: For FESOP applications, all required compliance demonstration records/reports must be submitted at the time of application. For Title V air operation permit applications, all required compliance demonstration reports/records must be submitted at the time of application, or a compliance plan must be submitted at the time of application.

7. Other Information Required by Rule or Statute:
   [ ] Attached, Document ID: _____ [ ] Not Applicable

EMISSIONS UNIT INFORMATION
Section [ ] of [ ]

I. EMISSIONS UNIT ADDITIONAL INFORMATION (CONTINUED)

Additional Requirements for Air Construction Permit Applications

1. Control Technology Review and Analysis (Rules 62-212.400(10) and 62-212.500(7), F.A.C.; 40 CFR 63.43(d) and (e)): ☐ Attached, Document ID: _____ ☒ Not Applicable
2. Good Engineering Practice Stack Height Analysis (Rules 62-212.400(4)(d) and 62-212.500(4)(f), F.A.C.): ☐ Attached, Document ID: _____ ☒ Not Applicable
3. Description of Stack Sampling Facilities: (Required for proposed new stack sampling facilities only) ☐ Attached, Document ID: _____ ☒ Not Applicable

Additional Requirements for Title V Air Operation Permit Applications

1. Identification of Applicable Requirements: ☐ Attached, Document ID: _____
2. Compliance Assurance Monitoring: ☐ Attached, Document ID: _____ ☒ Not Applicable
3. Alternative Methods of Operation: ☐ Attached, Document ID: _____ ☒ Not Applicable
4. Alternative Modes of Operation (Emissions Trading): ☐ Attached, Document ID: _____ ☒ Not Applicable

Additional Requirements Comment

ATTACHMENT 1

TARMAC AMERICA, LLC

FACILITY ID: 0250020

APPLICATION FOR AIR CONSTRUCTION PERMIT AUTHORIZING ALTERNATIVE FUELS PROJECT

Regulatory Applicability Analysis

Background

The Florida Department of Environmental Protection (DEP) issued an air construction permit for the new Tarmac dry-process cement kiln in 2002 and it began operating in 2004. The Tarmac kiln is currently authorized through its air permits to use the following as fuels: bituminous coal, used oil, No. 6 oil, No. 2 oil, natural gas, and whole tires. To expand the types of fuels that may be used in the cement kiln, this air permit application requests the authority to add specific fuels listed in the Project Description, alone or in any combination.

The use of these fuels in the kiln has important co-benefits, including reduced greenhouse gas emissions through the use of biogenic materials in lieu of fossil fuels and by preventing the formation of methane in landfills; reduced environmental impacts associated with fossil fuel extraction, transportation, and usage (mining of coal, refining of petroleum, etc.); and reduced environmental impacts associated with landfill usage.

Federal

1. **NSPS Subpart Eb (Large MWCs), 40 CFR 60.50b-60.59b – *Not Applicable***

Standards of Performance for Large Municipal Waste Combustors for Which Construction is Commenced After September 20, 1994 or for Which Modification or Reconstruction is Commenced After June 19, 1996

NSPS Subpart Eb regulating large municipal waste combustors does not apply to cement kilns. The federal rules specifically provide as follows: "Cement kilns firing municipal solid waste are not subject to this subpart." 40 CFR 60.50b(p). Under this subpart, "municipal solid waste" is defined as:

> "... household, commercial/retail, and/or institutional waste. Household waste includes material discarded by single and multiple residential dwellings, hotels, motels, and other similar permanent or temporary housing establishments or facilities. Commercial/retail waste includes material discarded by stores, offices, restaurants, warehouses, non-manufacturing activities at industrial facilities, and other similar establishments or facilities. Institutional waste includes material discarded by schools, nonmedical waste discarded by hospitals, material discarded by nonmanufacturing activities at prisons and government facilities, and material discarded by other similar establishments or facilities. Household, commercial/retail, and institutional waste does not include used oil; sewage sludge; wood pallets; construction, renovation, and demolition wastes (which includes but is not limited to railroad ties and telephone poles); clean wood; industrial process or manufacturing wastes; medical waste; or motor vehicles (including motor vehicle parts or vehicle fluff). Household, commercial/retail, and institutional wastes include: (1) Yard waste; (2) Refuse-derived fuel; and (3) Motor vehicle maintenance materials limited to vehicle batteries and tires except as specified in s. 60.50b(g)."

The term "refuse-derived fuel" is in turn defined as "a type of municipal solid waste produced by processing municipal solid waste through shredding and size classification. This includes all classes of refuse-derived fuel including low-density fluff refuse-derived fuel through densified refuse-derived fuel and pelletized refuse-derived fuel." 40 CFR 60.51b.

The use of any materials considered to be municipal solid waste or refuse-derived fuel, consistent with the above definitions, may therefore be used in a cement kiln without subjecting the kiln to NSPS Subpart Eb. Because cement kilns using municipal solid waste and refuse-derived fuel are not subject to Subpart Eb, Tarmac's use of the proposed list of fuels in its kiln, even if the fuels would be considered municipal solid waste, would not trigger applicability of Subpart Eb.

2. NSPS Subpart CCCC (2000 CISWI and 2011 New Unit CISWI), 40 CFR 60.2000-60.2265 – *Not Applicable*

Standards of Performance for Commercial and Industrial Solid Waste Incineration Units for Which Construction is Commenced After November 30, 1999 or for Which Modification or Reconstruction is Commenced on or After June 1, 2001

Cement kilns subject to the Cement MACT, like the Tarmac cement kiln, are exempt from the 2000 version of Subpart CCCC. The 2000 version of Subpart CCCC therefore does not apply. The 2011 version of Subpart CCCC applies only to new units (constructed after June 2010). Because the Tarmac cement kiln is considered an "existing" unit and is not considered a "new" unit for purposes of the 2011 version of Subpart CCCC, the 2011 version is not applicable even if solid waste were to be used as a fuel or an ingredient in the Tarmac cement kiln. The only exception would be if the kiln were to be "modified" or "reconstructed" after September 21, 2011.

EPA's rules for Commercial and Industrial Solid Waste Incineration (CISWI) Units were first promulgated on December 1, 2000 (60 Federal Register 75338), and in 2001 EPA granted a request for reconsideration and voluntarily remanded the rule, which the court granted without vacatur. This rule was never stayed and remains in effect. Subpart CCCC, as promulgated in 2000, specifically provides that cement kilns regulated under NESHAP 63 Subpart LLL, the Cement MACT, are *exempt* from compliance with the CISWI rules under Subpart CCCC. 40 CFR 60.2020(l). This exemption remains effective for compliance with the 2000 version of Subpart CCCC.

EPA subsequently revised the rules in 2005. Those revisions were then challenged, resulting in the D.C. Circuit Court of Appeals vacating and remanding the "CISWI definitions rule" in 2007. As a result of the 2007 remand, EPA revised Subpart CCCC this year (76 Federal Register 15704 (March 21, 2011)), and the new Subpart CCCC requirements become effective on May 20, 2011. EPA's preamble specifically provides that only "incinerators" and "small remote incinerators" remain subject to the standards in the 2000 Subpart CCCC rules. See 76 Federal Register 15711, col. 2. EPA states that CISWI units falling within other subcategories,

including cement kilns, *"will not in any case"* be subject to the 2000 Subpart CCCC CISWI standards.

Under the new, 2011 version of Subpart CCCC, new, modified, reconstructed cement kilns will no longer be exempt from the CISWI rules. Paragraph (l) of 40 CFR 60.2020 that established the exemption from Subpart CCCC is now "reserved." Waste-burning cement kilns constructed prior to June 4, 2010, are not considered to be "new" units subject to the 2011 Subpart CCCC standards (unless they are subsequently modified or reconstructed). Waste-burning cement kilns constructed prior to June 4, 2010, are considered to be "existing" units subject to the 2011 version of NSPS Subpart DDDD (and not the 2000 or 2011 versions of Subpart CCCC). As explained in more detail below, if the Tarmac cement kiln were to use solid waste (not engineered or alternative fuels) in the future after Subpart DDDD becomes applicable and enforceable in Florida, then standards established pursuant to Subpart DDDD could apply (but not Subpart CCCC—unless the kiln is modified or reconstructed after September 21, 2011).

3. <u>NSPS Subpart DDDD (CISWI, Existing Units)</u>, 40 CFR 60.2500-60.2875 – *Not Applicable*

Emissions Guidelines (EG) and Compliance Times for Commercial and

Industrial Solid Waste Incineration Units

Under the 2000 version of Subpart DDDD, which is applicable in Florida, cement kilns are specifically exempt (along with 14 other source categories). The 2011 version of Subpart DDDD will not apply to waste-burning kilns in Florida until the Department of Environmental Protection undertakes a rulemaking to incorporate the provisions of Subpart DDDD into its rules, the Department submits a state plan to or seeks delegation from EPA, and EPA subsequently approves the plan or grants delegation. The new version of the rule, applicable to existing waste-burning kilns, does not apply directly to sources, and it is not anticipated that the requirements would be effective in Florida for at least two to five more years.

NSPS Subpart DDDD establishes "emission guidelines" and compliance schedules for the control of emissions from <u>existing</u> CISWI units. This NSPS does not establish standards that apply directly to emission units because "NSPS" standards are to be established for <u>new</u> units. Because Subpart DDDD is intended to apply to "existing" and not "new" units, the rules are considered "guidelines" for states. Unlike most NSPS standards, Subpart DDDD applies to state

air quality programs instead of to emission units. A state may submit a request for delegation of Subpart DDDD or a state may develop its own "state plan" to implement Subpart DDDD. 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. 40 CFR 60.2524.

Regardless of whether a state develops its own plan or simply requests delegation by March 21, 2012, the deadline for compliance may not be later than March 21, 2016, or three years after the effective date of EPA's approval of the state plan, whichever occurs first. Because the 2011 version of Subpart DDDD was promulgated by EPA only within the last few weeks, the Florida Department of Environmental Protection (DEP) has not yet taken steps to develop a state plan or to seek delegation of Subpart DDDD, either of which would require notice and comment rulemaking under Chapter 120, Florida Statutes. The 2011 version of Subpart DDDD does not establish immediate and direct compliance requirements for non-incinerator CISWI units (like waste-burning kilns), so Subpart DDDD is not currently applicable to the Tarmac cement kiln, regardless of the fuels used. Further, units *not* using solid waste as a fuel will not be subject to Subpart DDDD now or in the future.

As stated above, the 2000 version of Subpart DDDD, which applies in Florida, exempts 15 different types of operations, including cement kilns. The Tarmac cement kiln is therefore not subject to this version of Subpart DDDD. Under the 2011 version of Subpart DDDD, waste-burning cement kilns that were constructed after November 30, 1999, and before June 4, 2010, will be required to comply with the standards and requirements for "existing units" established under Subpart DDDD – as implemented by the state. As long as the Tarmac cement kiln does not burn solid waste, it will not be subject to Subpart DDDD. If the Tarmac cement kiln were to begin using solid waste as a fuel, then Subpart DDDD (Table 8) could apply once Florida adopts the rules and its approved plan or delegation is in place. There is not currently a 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. Until the Florida DEP completes a rulemaking to implement the 2011 version of Subpart DDDD through a state plan or delegation from EPA, and EPA has approved that plan or delegation, the provisions of the 2011 version of Subpart DDDD are not applicable to exiting CISWI waste-burning kilns in Florida regardless of the fuels being used. The Tarmac cement kiln is therefore not subject to Subpart DDDD at this time, regardless of the fuel it uses.

4. **Solid Waste Definition: 40 CFR 241; Alternative Fuels Proposed for Tarmac's Cement Kiln are *not Solid Waste***

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

EPA recently promulgated new rules to be used when determining whether non-hazardous secondary materials are solid waste or not when used as fuels or ingredients in combustion units, including cement kilns. 40 CFR 241.3 (76 Federal Register 15456, March 21, 2011). The new rules provide that non-hazardous secondary material is *not* solid waste when combusted as a fuel or used as an ingredient if the material is sufficiently processed and it meets a "legitimacy" test. Under the legitimacy test, the processed material must be managed as a valuable commodity, storage of the material must not exceed reasonable time frames, and the material must be managed and adequately contained. In addition, the material must have a meaningful heating value if used as a fuel and must provide a useful contribution to the production or manufacturing process if used as an ingredient. Lastly, the material "must contain contaminants at levels comparable in concentrations to or lower than those in traditional fuels which the combustion unit is designed to burn." 40 CFR 241.3(d).

Under EPA's rules, a facility would either maintain records to demonstrate that any non-hazardous secondary materials used as a fuel or ingredient do not constitute solid waste, or a facility could seek a "non-waste determination" from the Regional EPA Administrator (e.g., Administrator of EPA Region IV) that a non-hazardous secondary material that is used as a fuel or ingredient is not a solid waste. Unless a facility seeks a formal determination, it would be required to maintain records to verify the sufficiency of the material processing and that the use of the material met the legitimacy test. Subpart CCCC (40 CFR 60.2740(v) provides that a facility burning materials other than traditional fuels "must keep records as to how the operations that produced the material satisfy the definitions of processing in s. 241.2." Alternatively, "[i]f the material received a non-waste determination pursuant to the petition process submitted under s. 241.3(c), you must keep a copy of the non-waste determination granted by EPA." EPA made it very clear in the preamble to the proposed definition of solid waste that facilities are to make self-determinations of whether a non-hazardous secondary material meets regulatory criteria *unless* a petition is submitted for an EPA determination. EPA believed that the self-implementing approach would "govern for the majority of situations." 75 Fed. Reg. 31860 (June 4, 2010). Facilities burning tires are likewise required to maintain records, including a certification that the tires are non-waste. This "certification" is to be signed by the owner or operator of the combustion unit, or by a responsible official of the established

tire collection program." There is no requirement for EPA (or a state's) pre-approval or subsequent approval. 40 CFR 63.2175(w).

Similarly, at least for units subject to the Boiler MACT rules under 40 CFR 63 Subparts DDDDD or JJJJJJ, a facility's responsible official would need to certify that the units did not use any non-hazardous secondary materials as a fuel or ingredient that would constitute a solid waste. Even under the new Boiler MACT rules, there is no requirement for agency consent or authorization prior to using the materials as a fuels or ingredients, nor is there a requirement for submittal of all supporting documentation to the permitting agency for confirmation that the materials being used are not solid waste.

Florida has not yet incorporated by reference EPA's new rules establishing the test for determining whether non-hazardous secondary materials are solid waste for purposes of the air emission standards. Florida has also not revised its rules to establish any different requirements for submittal of information for determinations as to whether materials being used as a fuel or ingredient are solid waste or not. Additionally, EPA is retaining authority to make any *formal* non-waste determinations—this authority to make such determinations is not being delegated to the states.

On the same day that EPA published the new definition of solid waste, EPA also published a notice announcing its intention to reconsider portions of the new rules. The rules are therefore somewhat in a state of flux and could change prior to any applicable compliance deadlines. After the Florida DEP has completed a rulemaking to implement the 2011 version of NSPS Subpart DDDD, after EPA has either approved the state's plan or has delegated implementation of the 2011 version of Subpart DDDD to DEP, and after a compliance deadline has been formally established, it may be appropriate to confirm that the Tarmac cement kiln will not be using any non-hazardous secondary material as a fuel or ingredient that would be considered a solid waste. This could be done by a responsible official certification similar to that required under CISWI and the Boiler MACT. This certification would help ensure that all applicable requirements are appropriately identified in the Title V permit for the facility. Today, however, Subpart DDDD does not apply to the Tarmac cement kiln, and Tarmac would not be prohibited from using a material in its cement kiln that constitutes a non-hazardous solid waste.

5. **NESHAP 63 Subpart LLL (Cement MACT), 40 CFR 63.1340-63.1358 – National Emission Standards for Hazardous Air Pollutants From the Portland Cement Manufacturing Industry** ***Applicable***

As set forth in Tarmac's Title V air operation permit, 40 CFR 63 Subpart LLL (commonly referred to as the Cement MACT) currently applies to the cement kiln, and new provisions based on revisions to the federal rule promulgated by EPA in 2010 will apply to the kiln beginning in 2013. (See 75 Federal Register 54970, September 9, 2010). The federal Cement MACT applies to all new and existing Portland cement plants at major and area sources, and the affected source includes the kiln. A "kiln" is defined under this rule to mean a device including the preheater and precalciner devices, and raw mills. The Cement MACT establishes emission limits that must be met, although it does not limit the types of materials that can be used in the kiln, other than clarification that if the kiln were to burn hazardous waste, it would be subject to and regulated under Subpart EEE instead of Subpart LLL.[1] The Tarmac cement kiln has not in the past and there is no intention in the future for the kiln to use "hazardous waste" as a fuel, so Subpart LLL and not Subpart EEE would apply. Again, Subpart LLL establishes emission limits and 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. As stated above, the use of solid waste does not at this time trigger any other NSPS or NESHAP standards. The Cement MACT controls. The Cement MACT requirements apply to the Tarmac kiln, and these requirements are already established in the current Title V permit.

State

Rule 62-296.407, F.A.C., applies to Portland cement plants. The emission limit established for "new" cement plant kilns is 0.3 pounds of particulate matter per ton of feed to the kiln. The limit established for clinker coolers within a new cement plant is 0.1 pounds of particulate matter per ton of feed to the kiln. The Tarmac kiln would be considered a new cement plant, so this standard would apply. The more stringent particulate matter emission standard of 0.063 pounds per ton of feed established under the Tarmac Title V permit, however, ensures that these emission limits set forth in Rule 62-296.407 are achieved.

[1] Subpart LLL addresses the use of fly ash a fuel but does not prohibit its use. Under 40 CFR 63.1346(f), the mercury content of fly ash may be restricted to ensure that mercury levels do not increase above baseline levels. Subpart LLL does not restrict any other type of fuel.

Local

The Miami-Dade County Code does not specifically regulate Portland cement kilns.

DESCRIPTION OF PROPOSED PROJECT

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INTRODUCTION

Tarmac America, LLC (Tarmac) owns and operates a cement plant located in Miami, Florida, designated as the Pennsuco Cement Plant. The cement plant consists of one dry-process kiln with preheater, precalciner, and clinker cooler capable of producing 2,190,000 tons per year (TPY) of clinker. The Department of Environmental Protection (DEP) issued an air construction permit for the new Tarmac dry-process cement kiln in 2002 and it began operating in 2004. The facility is currently permitted to utilize bituminous coal, used oil, No. 6 oil, No. 2 fuel oil, natural gas, and whole tires. The Tarmac kiln is currently authorized through Title V its current air permit to process and inject the following fuels: bituminous coal, used oil, No. 6 oil, No. 2 oil, natural gas, and whole tires. To expand the types of fuels that may be used in the cement kiln, this air permit application requests the authority to process and inject in the back-end kiln for the following fuels, alone or in any combination:

- Coal, non-specific
- Engineered fuel
- Tire-derived fuel (including tire fluff)
- Agricultural film
- Agricultural Byproducts
- Carpet-derived fuel
- Clean cellulosic biomass
- Other cellulosic biomass
- Shingles, manufacturer rejects
- Pre-consumer paper

The equipment to process and inject these fuels is requested through this permit. In addition, PSD analysis of each fuel is provided as reasonable assurance that use of these fuels does not

result in a significant net emissions increase. Subsequent to construction of the injection system and processing equipment, Tarmac will comply to annual review of emissions per, rule 62-212.300(1)(e), F.A.C. As discussed in the regulatory analysis, this permit will assure compliance to all federal, state, and local regulations.

This application does not request for an increase in either production or operation limits. During this construction permit, the Pennsuco Cement Plant shall operate under and at all times within the constraints specified by its existing operation permit (0250020-026-AV). If the co-firing of any material results in emissions exceeding current permit limits, co-firing shall cease immediately.

Tarmac believes this project is beneficial to the operation of the facility, as well as to the State of Florida for the following reasons:

1. Increase in the availability and stability of energy sources through the use of locally generated, processed, and transported energy sources in comparison to conventional fuels (i.e., coal which is transported from around the world).
2. Promotion of related recycling business activities (i.e., employment, taxable income) in the State.
3. Reduction of greenhouse gas emissions by re-using and reducing landfilled biogenic material, reducing source material transportation, and reducing methane emissions from landfilled materials.
4. Increase in the demand for recovered materials, which encourages an increase in processing versus landfilling. This matches the goals of the State efforts to increase waste diversion for re-use or recycling,[2]
5. Promotion of a more diverse energy supply.

[2] http://www.dep.state.fl.us/waste/recyclinggoal75/default.htm (last visited April 18. 2011)

While these materials may be considered recovered or byproduct by some, they have the capacity to deliver significant heating value. Efficient thermal combustion in a cement kiln can provide an alternative use for the material heat content, as well as supplying a component to the cement making process when noncombustible material (e.g., sand/silica) is introduced into the kiln. The use of alternative materials in cement production will eliminate a substantial amount of landfilled waste, as well as reduce environmental taxes associated with the cement industry through mining, transport, and the use of fossil fuels. Similarly, when this waste is oxidized as fuel in a combustion environment, greenhouse gas emissions are effectively reduced when compared to the landfill process, which generates methane as a byproduct of anaerobic decomposition. The greenhouse gas potential of methane is 21 times greater than that of the carbon dioxide produced during combustion. A significant recent EPA-funded study indicates the environmental air emissions benefits of waste combustion compared to landfilling with gas reclamation[3].

Tarmac views its effort to promote the beneficial use of these recovered materials in cement production to be in concert with the guidance of the EPA[4] and European IPPC Bureau[5] The World Business Council for Sustainable Development lists the United States as 13 in the list of countries replacing conventional fuels with alternative fuels including countries such as Germany and Switzerland[6]. In 2009, German cement plants replaced conventional fuels with alternative fuels on the average by 58 percent[7]. The attached CD includes a number of studies and presentation information of activities around the world of the use of alternative fuels in cement kilns.

Each of these fuels are discussed below for comparative emissions for PSD analysis. Because the PSD analysis will be verified by an annual review per rule 62-212.300(1)(e), F.A.C., these fuels should not

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[3] Rosenthal, E. *Europe Finds Clean Energy in Trash, but U.S. Lags*. 2011 [cited 2011 3/10/2011]; Available from: http://www.nytimes.com/2010/04/13/science/earth/13trash.html?_r=1

[4] International, I. *Trends in Beneficial Use of Alternative Fuels and Raw Materials*. 2008; Available from: http://www.epa.gov/sectors/pdf/cement-sector-report.pdf.

[5] Cement, Lime and Magnesium Oxide Manufacturing Facilities, May 2010, Table 4.16, http://eippcb.jrc.ec.europa.eu

[6] Development, W.B.C.f.S., *Guidelines for the Selection and Use of Fuels and Raw Materials in the Cement Manufacturing Process*, 2005, http://www.wbcsd.org/DocRoot/Vjft3qGjo1v6HREH7jM6/tf2-guidelines.pdf (last visited April 2, 2011)

[7] Verein Deutsche Zementindustrie, Environmental Data of the German Cement Industry 2009, http://www.vdz-online.de/uploads/media/Environmental_data_2009.pdf (last visited April 2, 2011)

require for air permitting purposes a test burn. The permit application is based on an analysis that compares baseline actual emissions with projected actual emissions and avoids the requirements of subsection 62-212.400(4) through (12), F.A.C.. Tarmac will be subject to the following monitoring, reporting and recordkeeping provisions.

a. The permittee shall monitor the emissions of any PSD pollutant that the Department identifies could increase as a result of the construction or modification and that is emitted by any emissions unit that could be affected; and, using the most reliable information available, calculate and maintain a record of the annual emissions, in tons per year on a calendar year basis, for a period of 5 years following resumption of regular operations after the change. Emissions shall be computed in accordance with the provisions in Rule 62-210.370, F.A.C.

b. The permittee shall report to the Department within 60 days after the end of each calendar year during the trial period setting out the unit's annual emissions during the calendar year that preceded submission of the report. The report shall contain the following:
   1) The name, address and telephone number of the owner or operator of the major stationary source;
   2) The annual emissions calculations pursuant to the provisions of 62-210.370, F.A.C., which are provided in Appendix C of this permit;
   3) If the emissions differ from the preconstruction projection, an explanation as to why there is a difference; and
   4) Any other information that the owner or operator wishes to include in the report.

c. The information required to be documented and maintained pursuant to subparagraphs 62-212.300(1)(e)1 and 2, F.A.C., shall be submitted to the Department, which shall make it available for review to the general public.

For this project, Tarmac requests that the permit require the annual reporting of actual emissions from the cement kiln for the following pollutants: CO, NOx reported as NO_2, SO_2 based on data from the existing CEMS; VOC based on data from the existing THC monitor; mercury (Hg) based on material balance; and PM based on stack test data.

Tarmac proposes that the proposed fuels acceptance criteria not be based on a specific fuel vendor or geographic location but on the merits of the fuel to comply to air permitting regulations. These pollutants are addressed below in separate sections for each material.

It should be noted that regarding air pollutant emission of organic compounds the EPA has repeatedly determined that high temperature and long residence times of cement kilns provided an optimum method of organic chemical destruction into benign, primary combustion by-products (e.g., CO_2, H_2O).

The NESHAP addressed concerns of metal emissions from cement kilns by use of particulate matter as a surrogate for metals. Tarmac's current PM limit is equal to that of the recently revised NESHAP, subpart LLL which is not applicable until 2013.

Quality Cement Production and Air Emissions

Coal and pet coke comprise over 85 percent of the fuels used currently in the U.S. cement industry[8]. Coal and pet coke are historically the fuels of choice, not for cost, but primarily for predictable fuel combustion properties. Alternative fuels that are out of balance to the chemistry of the kiln system, can cause significant physical damage to the kiln. For example, highly variable heat content and fuel mass flow can cause local overheating and redox reactions. The potential for increased thermal stresses in the kiln can damage the anchor and furnace shell. Variable alkali, chlorine, or sulfur content of a fuel can cause kiln refractory damage and possibly alkali bursting. As well, the mechanical behavior of particle size of fuels plays an important role in thermal distribution that must be considered.

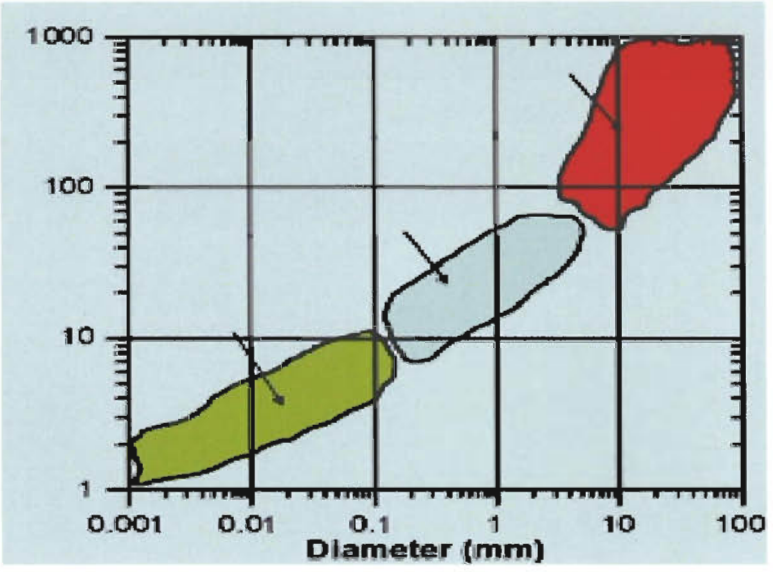


Figure 1. Burnout time (seconds) versus fuel particle size (mm)

Source: http://www.flsmidth.com/~/media/Brochures/Brochures%20for%20kilns%20and%20firing/AlternativeFuel.ashx

[8] International, I. *Trends in Beneficial Use of Alternative Fuels and Raw Materials*. 2008; Available from: http://www.epa.gov/sectors/pdf/cement-sector-report.pdf.

Clearly, as the percent of fuel substitution increases, the specifications of the alternative fuel must be tighter. If the fuel has highly variably properties, the cement product can be ruined and the value of both cement and fuel is worthless.

In summary, a kiln functions to make cement, not to burn fuel.

The discussion above of the optimum burning regime and the effect of coal ash clearly shows the need to use a fuel that has constant and controllable composition and characteristics.

TRANSPORT, HANDLING, STORAGE, PROCESSING AND INJECTION

All materials will be transported to the facility by covered truck and stored in trailers or under cover on top of a paved or compacted clay surface. The materials will be supplied to the facility in a manner suitable for mechanical and/or pneumatic injection into the pyroprocessing system through a feeding system that includes both pneumatic and mechanical systems at the base of the precalciner tower. Mechanically transported materials will be moved by automated conveyance from storage to a hopper which feeds the injection system through an enclosed bucket elevator, crossing a weigh belt before being injected into the precalciner. Pneumatically transported materials will be fed from the dump hopper into a weigh Shenck feeder system, and then be pneumatically blown through an eight inch pipe into the calciner. The design capacity of both systems is expected to be 15 tons/hour.

Dust suppression, as needed, will consist of water sprays. Any stored material having nuisance odors will be removed from the site. Emissions from on-site material transport, storage, handling and processing are provided in Table 1.

A quantity of 200,000 tons of fuel is estimated to be conservative amount to be transported to the site annually. Grinding of any fuel materials is not expected to be needed as the fuel supplier will be required to deliver sized materials. However, Tarmac wants the option to grind, if needed, fuel materials on site. This option will allow fuels such as cellulosic biomass to be further processed if a batch of material affects (e.g., clogging) the handling system. To remove the material and grind off-site wastes the time and effort to size on site. As well, the material will lose heat value through natural degradation as the material remains in storage and unburned. Tarmac sees the onsite processing as a logical option to deal with materials than need to be resized. As such, Tarmac limits the grinding to less

than 75,000 tons per year. The resulting emissions from the grinding operations are below five tons for each pollutant allowing this operation to be an unregulated emissions unit.

TABLE 1. FUGITIVE EMISSIONS ESTIMATE – TRANSPORT, STORAGE, HANDLING, AND PROCESSING

Step	Action/Task	Unit of Measurement	% of Total Throughput	PM Emission Factor	PM_{10} Emission Factor	PM Emissions	PM_{10} Emission Factor
1	Material Transport to Piles[a,b]	9,333 miles	100%	0.524 lb/VMT	0.524 lb/VMT	2.45 tons	2.45 tons
2	Store in Covered Pile	200,000 tons	100%	*negligible, stored under cover*			
3	Material Loading to Grinding Hopper by Frontend Loader	200,000 tons	100%	8.74E-05 lb/ton	4.13E-05 lb/ton	8.74E-03 tons	4.13E-03 tons
4	Grinder[b]	200,000 tons	100%	0.0012 lb/ton	0.00054 lb/ton	0.12 lb/ton	0.054 lb/ton
5	Screening[b]	200,000 tons	100%	0.0001 lb/ton	0.000046 lb/ton	0.014 lb/ton	0.0046 lb/ton
6	Material Transport to Injection System[a,b]	1,333 miles	100%	0.524 lb/VMT	0.524 lb/VMT	0.35 tons	0.35 tons
7	Material Loaded into Pneumatic Hopper[b]	200,000 tons	100%	0.0001 lb/ton	0.0001 lb/ton	0.010 tons	0.010 tons
8	Pneumatic Transport to Calciner	200,000 tons	100%	*negligible, fully enclosed*			
					Total:	2.95 tons	2.87 tons

Source	Hours	SO_2 Emission Factor[c]	NO_x and NMHC Emission Factor[c]	CO Emission Factor[c]	SO_2 Emissions	NO_x and NMHC Emissions	CO Emissions
Grinder Engine (630 HP Engine, 75,000 at 50 ton/hr)	1,500 hours	0.929 gr/bhp.hr	3.0 gr/bhp.hr	3.7 gr/bhp.hr	0.9228 lb/ton	3.0298 lb/ton	3.6755 lb/ton
Screen Engine (100 HP Engine, 75,000 at 50 ton/hr)	1,500 hours	0.929 gr/bhp.hr	3.0 gr/bhp.hr	2.6 gr/bhp.hr	0.1538 lb/ton	0.4967 lb/ton	0.4305 lb/ton

Sample Calculations:	
Step 1	$\frac{1.4\ miles}{trip^d} \times \frac{trip^d}{15\ tons} \times 200{,}000\ tons\ alt\ fuel = 9{,}333\ miles$
Step 6	$\frac{0.1\ miles}{trip} \times \frac{trip}{15\ tons} \times 200{,}000\ tons = 1{,}333 miles$
a.	$E = \left[k\left(\frac{sL}{2}\right)^{0.65}\left(\frac{W}{3}\right)^{1.5} - C\right] x\ (1 - \frac{P}{4N})$ where from AP-42 and references, $k=0.082$, $sL=0.4$, $W=22$, $C=0.00047$, $p=120$, $N=1$ $E = \left\lvert k\left(\frac{0.4}{2}\right)^{0.65}\left(\frac{22}{3}\right)^{1.5} - 0.00047\right\rvert x\ (1 - \frac{120}{4}) = 0.524$

a. Potential PM emissions from truck traffic from paved roads are calculated based on AP- 42 factors in 13.2.1-1 and -2 and calculation a. above

b. Emission factors of screening, crushing, and conveying based on AP-42 Table 11.19.2-2. Alternate fuel PM factors assumed to have similar emissions to aggregate operation. Uncontrolled emission factors are used.

c. Schenk Shredder, shredding at minimum of 50 tn/hr of biomass having diesel engine maximum size 630 (grinder) and 100 (screen) horse power. Total shredding requires 1400 hours. 100 and 630 HP Tier 3 engine emission factors stated below. SO2 EF based on AP-42, 3.3-1 emission factor =0.929gr/bhp*hr-SOx.

d. Trip: route from plant entrance to storage piles

Engine Power	Tier	Year	CO	HC	NMHC+NOx	NOx	PM
(100 ≤ hp < 175)	Tier 2	2003	3.70	-	4.90	-	0.22
	Tier 3	2007	3.70	-	3.00	-	-†
(600 ≤ hp < 750)	Tier 2	2002	2.60	-	4.80	-	0.15
	Tier 3	2006	2.60	-	3.00	-	-†

Tarmac is investing significant capital into this enclosed permanent mechanical feeder system. The system has an expected design capacity of 15 tons per hour dependent on factors such as material viscosity and density. The time frame for completing the capital budgeting process (following issuance of the air construction permit), engineering and design, equipment procurement process, obtaining the necessary building permits, and constructing the equipment will take approximately twelve to eighteen months to complete. Following completion of equipment installation, Tarmac will begin to introduce each of the various alternative fuels over the next twelve to eighteen months. Tarmac therefore requests a three-year construction permit for this project.

Figure 2 shows the proposed enclosed mechanical feeder system. Figure 3 shows the proposed pneumatic system. Figure 4 shows the location where storage will be located.

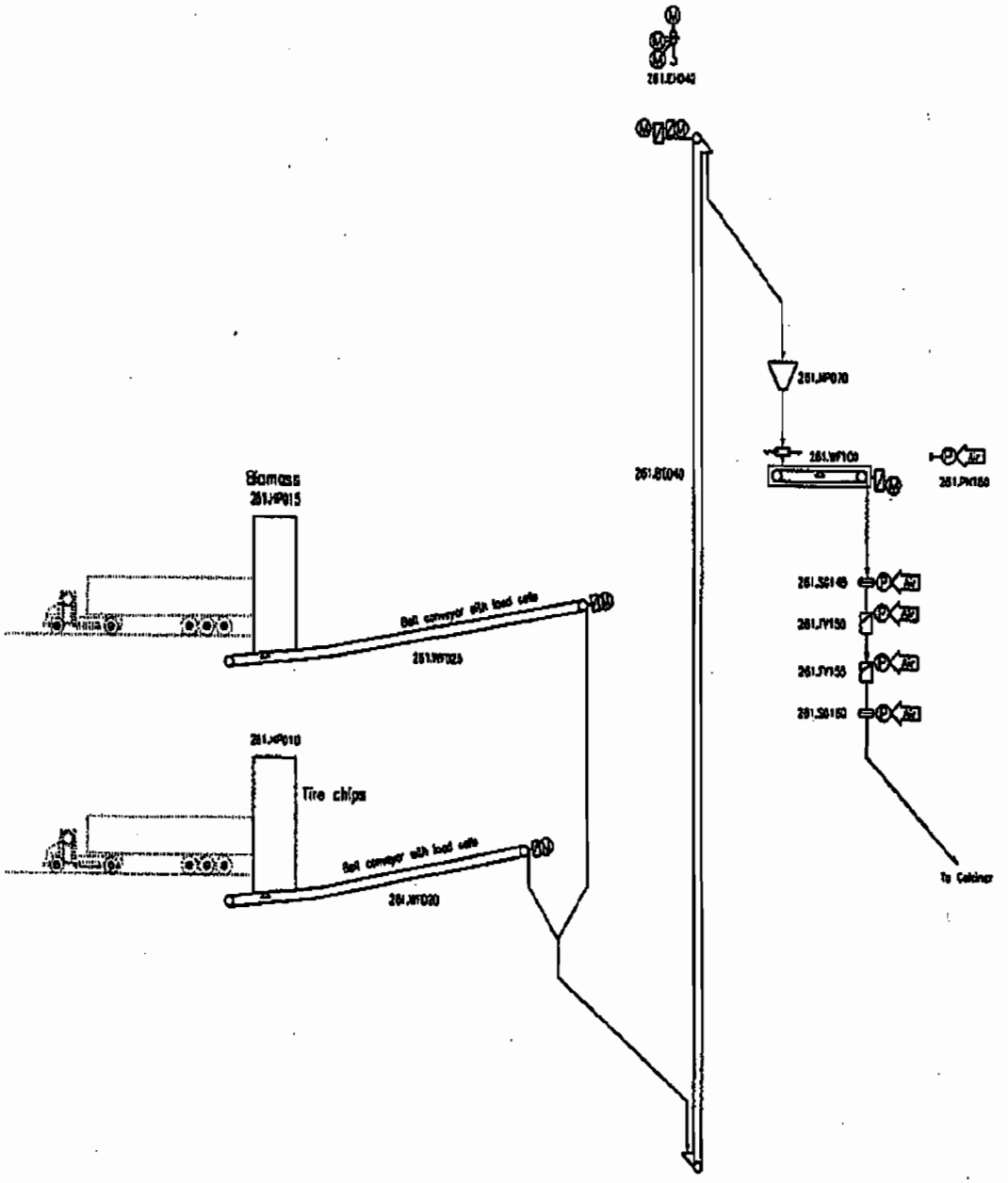


FIGURE 2. MECHANICAL FEEDER SYSTEM.

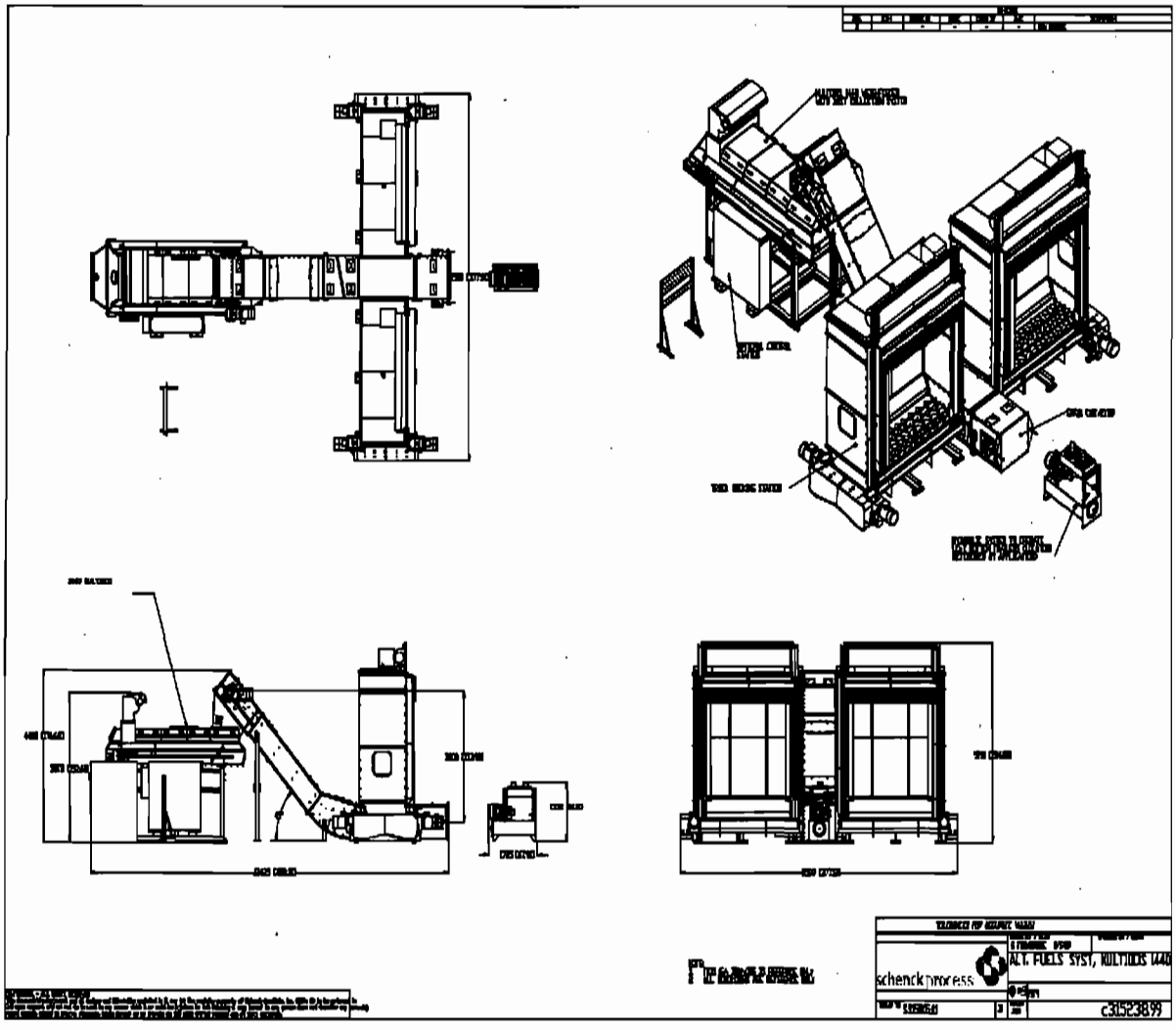


FIGURE 3. PNEUMATIC FEEDER SYSTEM.

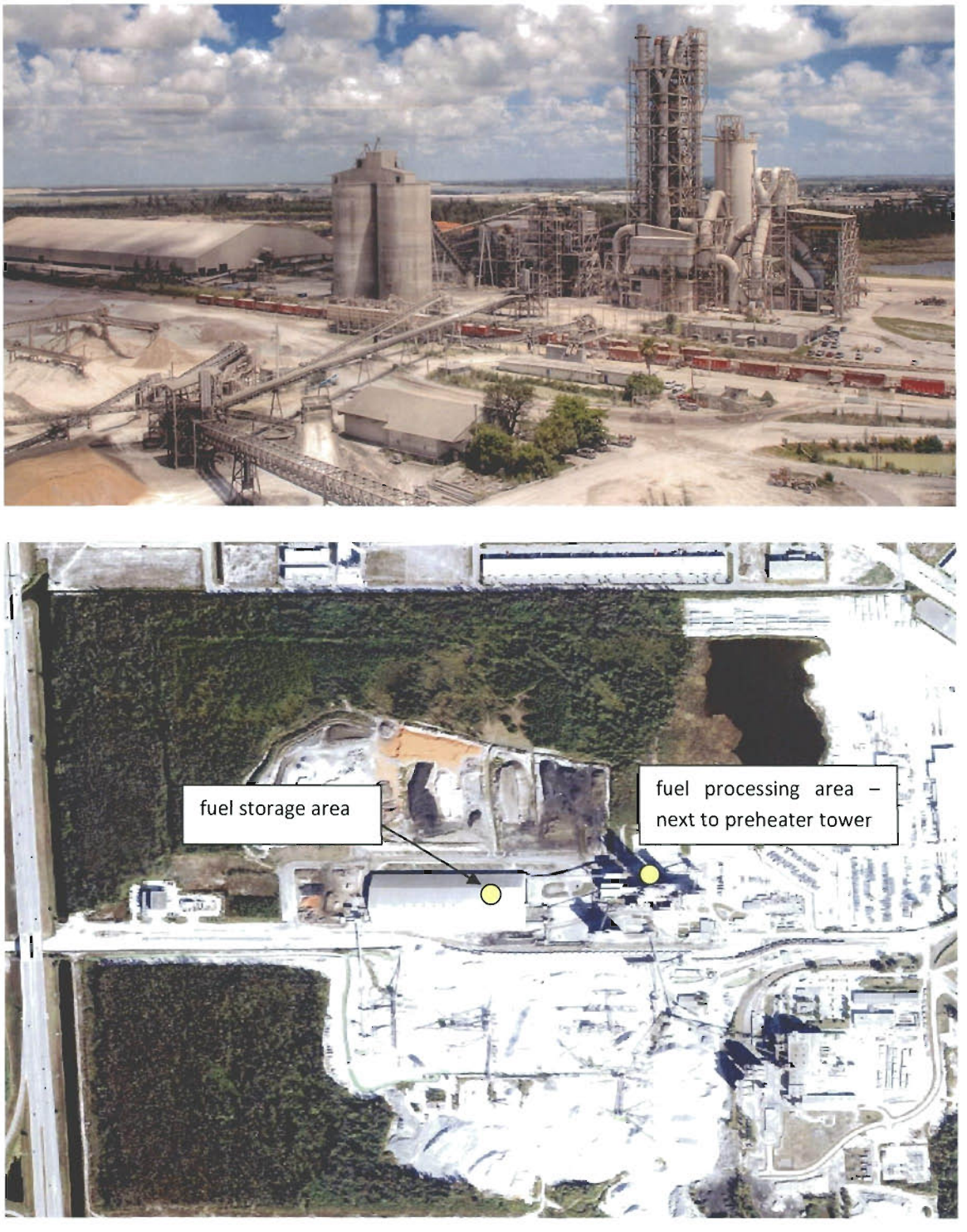


FIGURE 4. LOCATION OF THE PROCESSING AREA NEXT TO THE KILN PRECALCINER.

BEST MANAGEMENT PRACTICES

The following best management practices are proposed for the use the fuels at the Pennsuco Cement Plant.

BEST MANAGEMENT PRACTICES (BMP) PLAN FOR MINIMIZATION OF FUGITIVE DUST, PILE MANAGEMENT, AND FIRE PREVENTION

Practice	Description
Minimization of Fugitive Dust	1) Drop points to storage areas shall be designed to minimize the overall exposed (or exposed to the atmosphere) drop height 2) Periodic equipment maintenance shall be performed to maintain offloading locations and associated drop point integrity. Appropriate plant records shall be maintained on transportation equipment maintenance performed. 3) Daily observations of the off/up-loading and transportation and associated drop point integrity to identify any equipment abnormalities 4) Plant personnel shall be trained on identification of warning signs for potential equipment malfunction 5) Signs shall be posted identifying potential warning signs of equipment malfunction 6) Plant personnel shall visually observe truck offloading operations and if excessive fugitive dust is detected appropriate fugitive dust minimization techniques shall be implemented including water spray. Plant personnel shall be trained on procedures for defining and minimizing excessive dust from the truck unloading operations.
Storage Pile Management	1) Storage areas shall be managed to avoid excessive wind erosion. The material will be stored in the proposed storage area, only, which is covered and protected from wind 2) Mechanical moving by front end loaders and other supporting equipment shall be minimized on high wind event days. 3) Daily visual observations of the storage area shall be performed and if conditions are right for fugitive dust formation, procedures from the fugitive dust plan shall be implemented including water spray

Fire Prevention/ Spontaneous Combustion Minimization	1) The current Emergency Response Plan includes: a. Requirement to train onsite personnel to handle incipient fires and training on the identification of potential fire hazards; and b. Install and maintain equipment for plant personnel to handle incipient fires 2) Daily observations of the storage area shall be performed by plant personnel to identify potential fire hazards. Plant personnel shall be trained on identification of potential fire hazards. 3) Compaction of recovered materials in the storage areas shall be minimized
Quality Assurance	1) The materials will be delivered to the Plant in vehicles designed to prevent release 2) For each shipment of material, the permittee shall record the date, quantity and a description of the material received. 3) The permittee shall inspect each shipment of material. If the permittee identifies any such material that is not the expected material, the material shall be rejected and returned to the supplier. Rejected materials shall be moved off site in a logistically reasonable time period. 4) The permittee shall maintain records of rejected shipments and disposition thereof. Such records shall be made available to the Department upon request.

MONITORING AND TESTING

Emissions monitoring for each material tested shall consist of the following monitoring and stack testing:

- NO_x – CEM Data (PSD pollutant)
- SO_2 – CEM Data (PSD pollutant)
- VOC (as THC) – CEM Data (PSD pollutant)
- Opacity – COM Data (surrogate for HAP per NESHAP subpart LLL)
- PM – EPA Method 5 (PSD pollutant)
- CO – CEM Data(PSD pollutant)
- Hg – Materials Balance (HAP per NESHAP subpart LLL)

Submittal of all stack test reports will be provided in a timely manner as required by rule.

PSD ANALYSIS - ESTIMATED EMISSIONS

It should be stressed that while emission estimates are addressed, the Pennsuco Cement Plant will not exceed any current permit limit. Furthermore, in comparison to combustion for raw power production, Tarmac must create a salable product using the combustion process. As such, the combustion must be well controlled and predictable. Upsets or erratic behavior in combustion not only affect emissions, which is of concern to Tarmac, additionally the created product can easily be ruined. The air construction permit should include a note recognizing a shakedown period of 90/180 days (i.e., within 90 days of reaching maximum production or within 180 days after construction is completed) for each fuel. We believe that the shakedown period is for each fuel type because the handling and injection system operation depends on the type of fuel input. For example, the pneumatic injection system will vary depending on the type of fuel, its moisture, its viscosity, its "burnability". As well, each fuel may clog, corrode or affect the handling and injection system differently. So the shakedown period functions to allow the handling and injection system to be functional with each fuel type not just the system being able to be turned off and on.

Estimated emissions are addressed in the following sections for each material. Baseline emissions are calculated in detail for the baseline fuel, which is coal, using the hierarchy of data per 62-210.370, F.A.C. The coal emission factors for NO_x, SO_2, CO and THC (as VOC) are based on facility CEMs data. Emission

factor of PM is based on the rolling average of stack tests performed for up to five year averages. Note that the facility commenced full operation of the new dry process kiln in 2004. Therefore, the emissions data for baseline is based on 2005 and forward years. The summary indicates that estimated emissions for any or all fuels should not exceed the values of PSD applicability thresholds.

Notwithstanding the calculation of estimated emissions, the following discussion is provided on current methods to control pollutant emissions applied at the Pennsuco Cement Plant.

In particular, mercury and lead emissions are discussed for a basis to not include these two compounds in the PSD analysis due to the limit (mercury limited to 229 lb/yr) and stack tested emissions of lead.

CARBON MONOXIDE EMISSIONS

Carbon Monoxide (CO) emissions are not expected to increase since they can be controlled through the process to complete combustion. Tarmac will closely monitor the combustion of all fuel materials to ensure there is no partial combustion which could create CO emissions, as well as other constituents. The Pennsuco Cement Plant is designed for the use of alternate fuels with reduced volatile content and a large partial sizing by having the addition of a separate calciner chamber. This separate calciner chamber is referred to as a Combustion Chamber. The Combustion Chamber allows for the introduction of alternative fuels along with kiln feed, tertiary air (ambient air/combustion air) and mixing with other fuels (fine coal) to insure proper ignition with retention in a high temperature atmosphere to initiate combustion of the alternate fuel.

In addition, the preheater is designed to extend retention time to provide long residence time at high temperatures to complete the combustion process. Tarmac will closely monitor the volatile content and particle sizing of the processed fuels along with the combustion characteristics of the preheater/calciner to insure proper combustion of all fuel. Currently, the Pennsuco Cement Plant operates with an oxygen rich combustion environment through the calciner and preheater assisting in the combustion process. Tarmac monitors CO with continuous emissions monitoring to insure compliance and proper combustion. Proper combustion will be maintained through process controls such as changes in the location of the introduction of tertiary air, increases in process draft and oxygen content through the process, changes in fine coal feed rates into the Combustion Chamber, and/or changes in the kiln feed rates.

Through testing and monitoring of the recovered materials prior to introduction and with combustion characteristics monitoring and process adjustments, Tarmac will be able to ensure proper and complete combustion of the alternate fuel with no generation of constituents of partial combustion, such as CO.

Nitrogen Oxide Emissions

Nitrogen Oxide (NO_x) emissions are not expected to change since they can be controlled by adjustments to the multistage combustion system timing, and fuel input rates.

Dioxin/Furans Emissions

Emissions of dioxin/furans (D/F) are not expected to change when using these alternate fuels due to the formation of D/F as a function of exhaust gas residence time and particulate matter loading when at a temperature range of 700°F to 400°F, which is independent of the fuel type. FDEP states in the technical evaluation for draft permit 0530021-031-AC,

> "At high temperatures and sufficient residence times, dioxins/furans can be destroyed. Pre-heater/pre-calciner kilns like that at the Brooksville South Cement Plant have high temperatures and sufficient retention times to destroy these organic compounds. The preheater/calciner design rapidly cools the exhaust gases, which prevents dioxin/furans from reforming."

Tarmac operates a pre-heater/pre-calciner kiln. Through the Portland cement NESHAP (40 CFR 63 subpart LLL), EPA restricts the inlet temperature to the baghouse to a limit that is established during emissions testing for D/F. At Tarmac, based on the most recent emissions test for D/F the baghouse inlet temperature is now restricted to a temperature of 241.2 degree F when the raw mill is up and 421.1 degree F when the raw mill is down. Tarmac has shown compliance s to the D/F standard (described below) since it was established by EPA.

0.4 nanograms (toxic equivalent) per dry standard cubic meter (corrected to 7% O_2) – when the temperature at baghouse inlet 400 degree F or less

0.2 nanograms (toxic equivalent) per dry standard cubic meter (corrected to 7% O_2) – when the temperature at baghouse inlet greater than 400 degree F.

Particulate Matter Emissions

The efficiency of a baghouse is related to the particulate loading. The impact of possible increased loading is to increase efficiency of particulate matter capture in the baghouse. The fuel type ash content impact on particulate matter loading is minimal (less than 10 percent of the total mass loading to the baghouse) given most of the particulate matter originates from the raw materials. As such the impact of PM emissions from fuel is expected to be limited. For example, the raw material particulate loading to

the baghouse is about 8 percent of the raw material input (425 raw material input = 34 tons of dust per hour). Particulate matter from fuel ash is based on fuel. Coal input for maximum production is 23 tons per hour. The ash content of coal is typically 10 percent . So the fuel ash dust loading to the baghouse is 2.3 tons per hours. Therefore, the fraction of fuel ash to total dust is 6.3 percent of the total dust loading to the baghouse. Assuming a scenario of an alternative fuel replacing half the coal input, having half the heat content and twice the ash content, the portion of fuel ash from 6.3 percent to 14.4 percent.

Collaborative studies by EPA show that with competent test teams, the within-team Relative Standard Deviation (RSD) of a Method 5 test was 10.4 percent and the between-team RSD was 12.1 percent[9]. More recently, ASME reported that the RSD is from 5 to 11% and the accuracy of a Method 5 test (the departure of the average of three test runs from the true stack gas concentration) should be less than 14.7 percent[10].

Given that the precision and accuracy of one standard deviation of Method 5 test results are in the range of approximately 10-15 percent of the emission rate being measured, the impact of the fuel ash content should be within the measurement error of Method 5 and should not result in a measurable increase.

MERCURY EMISSIONS

The current permitted limit of 229 pounds per year. The PSD threshold is 200 pound per year. The current amount of mercury input for 2010 is 0.00132 lb Hg/ton clinker resulting in 94 pounds of mercury for production of 712,691 tons of clinker in 2010. Therefore, the PSD analysis for each material does not include mercury.

LEAD EMISSIONS

Stack testing in 2009 showed by EPA method 29 that lead emissions are (0.00207 lb/hr) 7 pounds per year for production of 3248 hours. The contribution of lead is from raw materials and fuels. The lead

[9] Quality Assurance Handbook for Air Pollution Measurement Systems: Volume III. Stationary sources Specific Methods. Section 3.16 EPA/600/4-77/027b.

[10] Lanier, S.; Hendricks, C. Reference Method Accuracy and Precision (ReMAP): Phase I. February 2001. ASME International.

content of limestone (85 percent or more of raw materials) is typically 3 ppm[11] and the typical content of coal is 10 ppm (Kentucky coal)[12]. Therefore the input from raw materials is predominantly from raw materials. Thus, any fuel contribution increase should be far below the PSD threshold of 1200 pounds per year. Therefore the PSD analysis for each material does not include lead.

FUEL ESTIMATED EMISSIONS

Each fuel type and the PSD analysis of each fuel is provided below. As noted above, the PSD analysis does not include mercury or lead. The analysis addresses NOx, SO2, CO, VOC and PM/PM10.

[11] Hill, L; Stevenson, R., Mercury and lead Content in Raw Materials. Portland Cement Association, R&D serial No. 288.

[12] http://kgs.uky.edu/kgsweb/DataSearching/Coal/Quality/QualitySearch.asp (last visited April 18, 2011)

TABLE 2. SUMMARY OF ESTIMATED EMISSIONS FOR RECOVERED MATERIALS

	SO_2 Inc./Dec. (tons)	NO_x Inc./Dec. (tons)	CO Inc./Dec. (tons)	VOC Inc./Dec. (tons)	PM Inc./Dec. (tons)	PM10 Inc./Dec. (tons)
Trucking					4.89	4.89
Grinding, handling and storage	1.08	3.53	4.11	3.53	0.61	0.61
Alternative fuels						
Coal (non-specific ranking)	0.0	0.0	0.0	0.0	0.0	0.0
Engineered fuel	-5.0	-449.3	-1045.4	-20.5	-9.7	-9.7
Tire Derived Fuel	-5.8	-476.8	-983.0	-32.8	-8.3	-8.3
Agricultural Film	-5.8	-476.8	-983.0	-32.8	-8.3	-8.3
Agricultural Byproduct	-5.0	-449.3	-1045.4	-20.5	-9.7	-9.7
Carpet-Derived Fuel	-5.0	-449.3	-1045.4	-20.5	-9.7	-9.7
Woody Biomass	-5.0	-449.3	-1045.4	-20.5	-9.7	-9.7
Manufacturer Reject Roofing Shingles	-5.8	-476.8	-983.0	-32.8	-8.3	-8.3
Preconsumer Paper	-5.0	-449.3	-1045.4	-20.5	-9.7	-9.7
Worst-case emissions from any fuel	0.0	0.0	0.0	0.0	0.0	0.0
↓	↓	↓	↓	↓	↓	↓
Total	1.08	3.53	4.11	3.53	5.50	5.50
↓	↓	↓	↓	↓	↓	↓
PSD Threshold	40	40	100	40	25	15
PSD Threshold exceeded?	NO	NO	NO	NO	NO	NO

COAL, NON-SPECIFIC

Tarmac requests to include all types of coal. As discussed below, the availability of all types of coal provides a option to Tarmac to maintain coal supplies from a broader range of sources. This coal can be processed in the existing coal mill and provide adequate heat input in the back end of the kiln as well as supplement front-end burning.

Coal is distributed around the world. It has been estimated that there are over 847 billion tonnes of proven coal reserves worldwide. This means that there is enough coal to last us around 119 years at current rates of production .[13]

USGS Information of coal[14]

Note please refer to the reference for linked figures and tables.

Coal is composed of complex mixtures of organic and inorganic compounds. The organic compounds, inherited from the plants that live and die in the swamps, number in the millions. The approximately more than 120 inorganic compounds in coal either were introduced into the swamp from waterborne or windborne sediment, or were derived from elements in the original vegetation; for instance, inorganic compounds containing such elements as iron and zinc are needed by plants for healthy growth. After the plants decompose, the inorganic compounds remain in the resulting peat. Some of those elements combine to form discrete minerals, such as pyrite. Other sources of inorganic compounds used by the plants may be either the mud that coats the bottom of the swamp, sediments introduced by drainage runoff, dissolved elements in the swamp water, windborne sand, ash, or dust.

Coals may contain as many as 76 of the 92 naturally occurring elements of the periodic table (fig. 9)[shown below]; however, most of those elements usually are present in only trace amounts on the order of parts per million. Occasionally, some trace elements may be concentrated in a specific coal bed, which may make that bed a valuable resource for those elements (such as silver, zinc, or germanium) (Finkelman and Brown, 1991). Some elements, however, have the potential to be hazardous (for example, cadmium or selenium), particularly if they are concentrated in more than trace amounts. Although as many as 120 different minerals have been identified in coal, only about 33 of them commonly are found in coal, and of these, only about 8 (quartz, kaolinite, illite, montmorillonite, chlorite, pyrite, calcite, and siderite) are abundant enough to be considered major constituents (table 1).

The organic compounds in coal are composed of the elements carbon, hydrogen, oxygen, nitrogen, sulfur, and trace amounts of a variety of other elements. Although only a few elements compose the organic compounds found in coal, these compounds are extremely complex and, as a result, they are not well understood; for example, an attempt to define the structure of just one organic compound in a brown coal (lignite) is shown in figure 10, but even this relatively simple structure is based on scientific conjecture. The organic compounds in coal produce heat when coal is burned; they also may be converted to synthetic fuels, or may be used to produce the organic chemicals shown in the centerfold illustration.

[13] http://www.worldcoal.org/coal/where-is-coal-found/ (last visited April 18, 2011)

[14] http://pubs.usgs.gov/circ/c1143/html/text.html

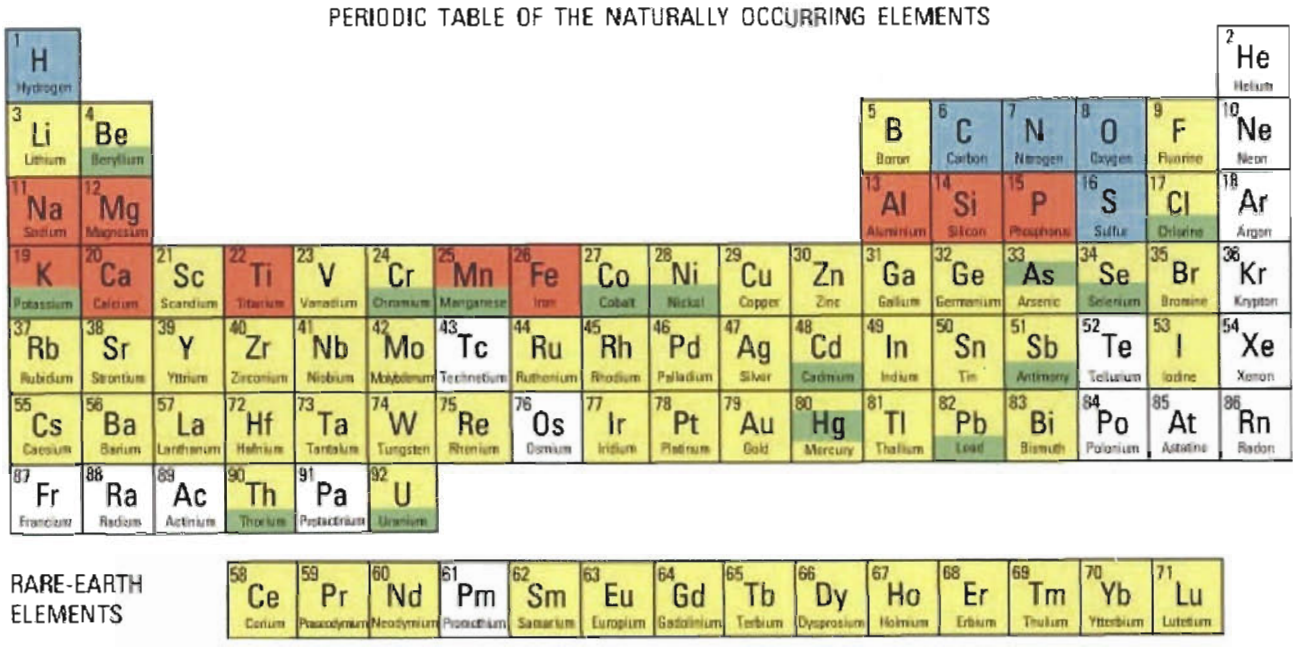


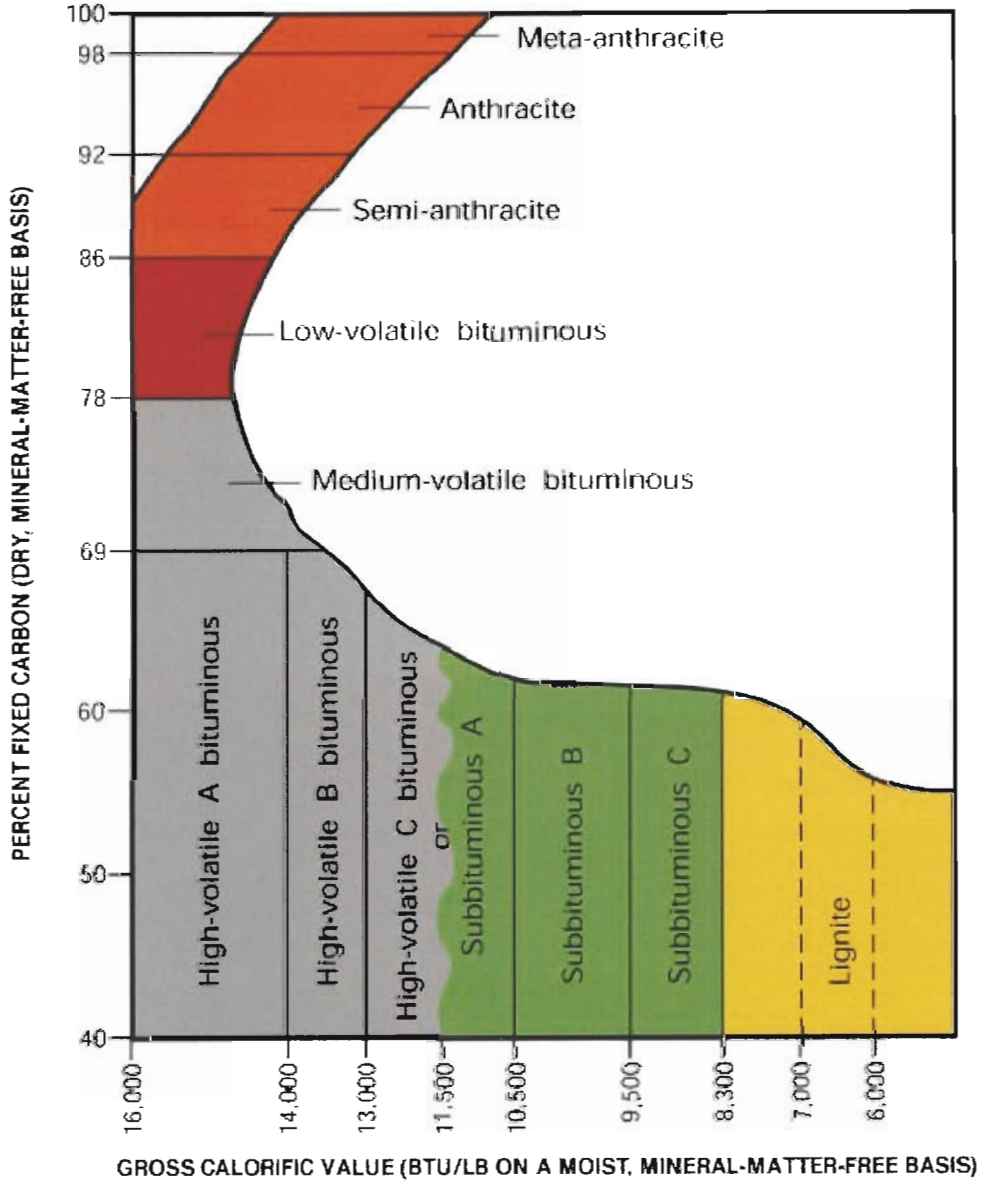
Figure 9. Periodic table of the elements. The 76 elements found in coal are highlighted by colors with regard to their general abundance in coal, as follows: blue, major elements (generally greater than 1.0 percent in abundance); red, minor elements (generally greater than or equal to 0.01 percent); and yellow, trace elements (generally less than 0.001 percent). Pursuant to the Clean Air Act Amendments of 1990 (Public Law 101-549), the U.S. Environmental Protection Agency (EPA) studied fifteen of these elements as potentially hazardous air pollutants (HAPs); green bars in their boxes indicate those fifteen elements. Thirteen of the original were cleared when the EPA found that there was no compelling evidence that they cause human health problems; a green bar across the bottom of the box indicates those elements. Two elements from the original fifteen, mercury (Hg) and arsenic (As), indicated by a green bar across the centers of their boxes, are still under study—mercury as a HAP and arsenic as a potential pollutant in ground water that flows through fly-ash and coal-mine spoil piles. Subsequently, in December 2000, EPA found that mercury emissions from coal-fired power plants require regulation; EPA will propose regulations in 2003 and issue final rules in 2004. Modified from Periodic Table of the Elements (Sargent-Welch Scientific Company, 1979), used with permission.

COAL RANK

A major factor in determining coal quality is coal rank. Rank refers to steps in a slow, natural process called "coalification," during which buried plant matter changes into an ever denser, drier, more carbon rich, and harder material. The major coal ranks, from lowest to highest, are lignite (also called "brown coal" in some parts of the world), subbituminous coal, bituminous coal, and anthracite. Each rank may be further subdivided, as shown in figure 17[shown below]. The rank of coal is determined by the percentage of fixed carbon, moisture (water), volatile matter, and calorific value in British thermal units (Btu) after the sulfur and mineral-matter content have been subtracted. Fixed carbon is solid, combustible matter left in coal after the lighter, volatile, hydrogen-rich compounds are driven off during coalification. Volatile matter is slowly removed from coal during coalification, but may be rapidly removed during destructive distillation. Volatile matter contains the raw materials from which the organic chemicals are obtained. In the U.S., the tests to determine the amounts of the above-mentioned substances and the rank of the coal are performed using standards published by ASTM International (2002).

In general, the higher the rank of a coal, the more deeply it was buried, and, therefore, the higher the temperature it was subjected to during and after burial. Older coals tend to be of higher rank because they are more likely to have been buried more deeply for longer periods of time than younger coals. To give a sense of the effects of increasing rank, the following comparison may be used: lignite is soft, dusty, and can ignite spontaneously under the appropriate conditions, whereas anthracite is quite hard, clean to the touch, and must reach a temperature of about 925°F before it will ignite. Furthermore, anthracite contains about twice the calorific value of lignite (about 15,000 Btu/lb and 7,000 Btu/lb, respectively) because lignite contains more moisture and oxygen and less fixed carbon than anthracite. Subbituminous and high-volatile bituminous C coals have oxygen and moisture content and

calorific values that range between those of lignite and anthracite. Bituminous coals of higher rank have calorific values that may exceed those of anthracite (fig. 17)[shown below].



PSD Analysis – Comparison to other projects

Comprehensive data of European cement kilns show that firing of alternative fuels does not increase emissions of air pollutants.[5] Therefore, for PSD analysis in review of other projects is the general trend of similar or reduced emissions from comparable projects. The following example of emissions summary data shows these general trends. A CD is attached that provides substantial additional data showing similar results.

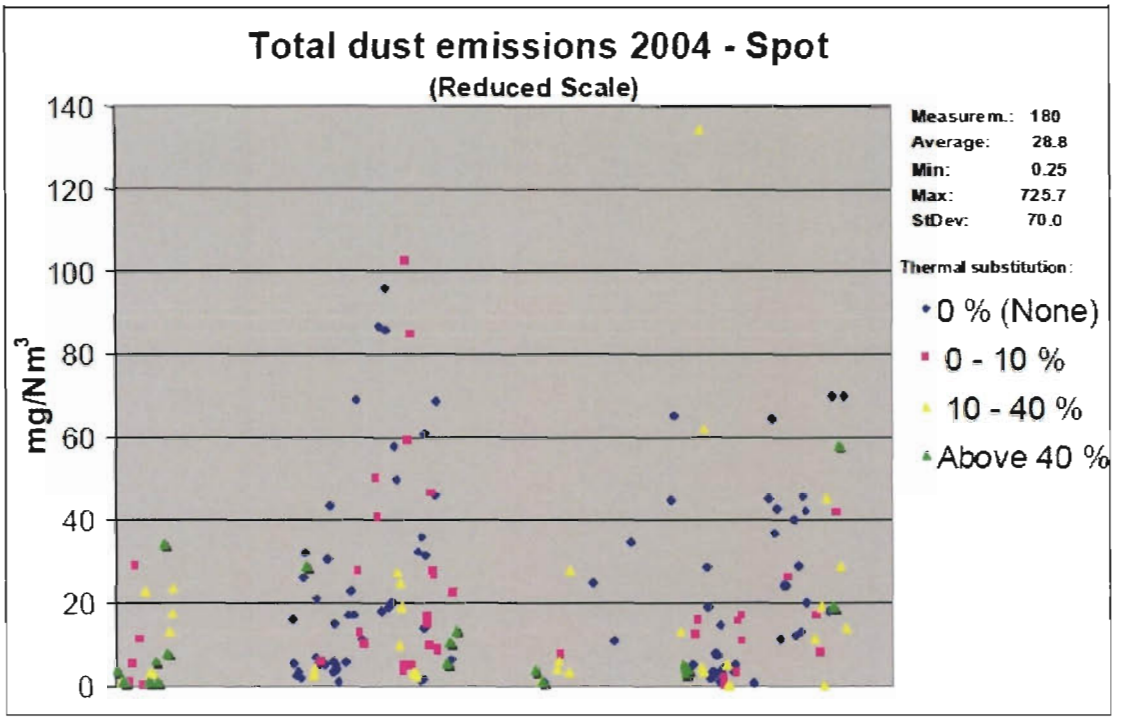


Figure 1.24: **Dust emission values from 180 spot dust measurements in the clean gas of rotary kilns in the EU-27 and EU 23+ countries**

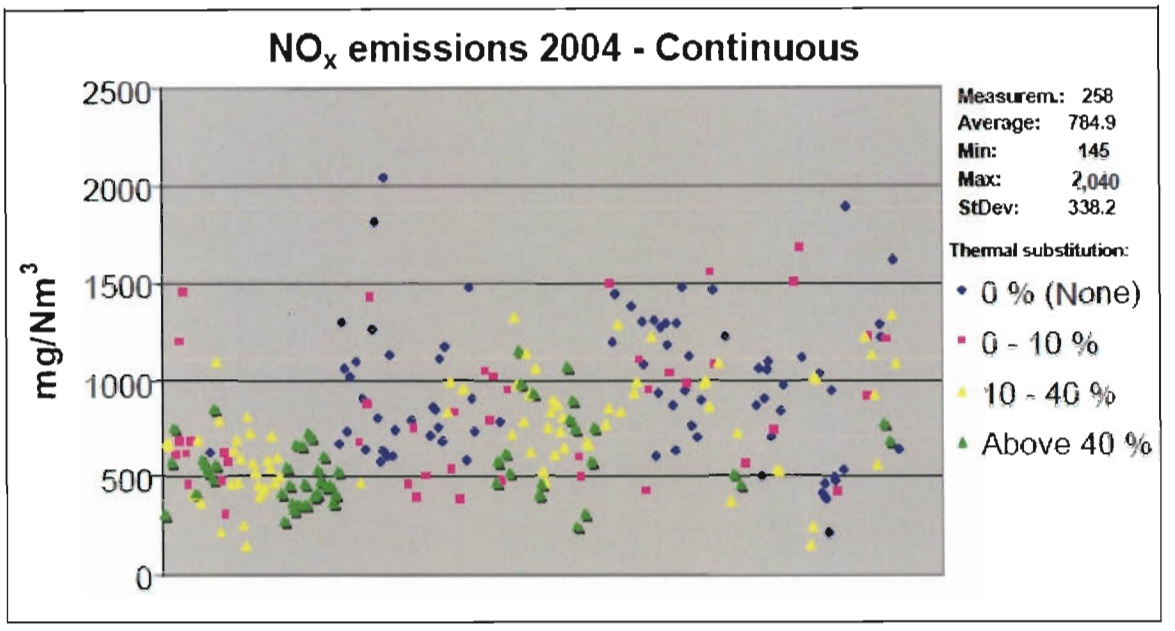


Figure 1.25: NO_x emissions (expressed as NO_2) from cement kilns in the EU-27 and EU-23+ countries in 2004 categorised by substitution rate

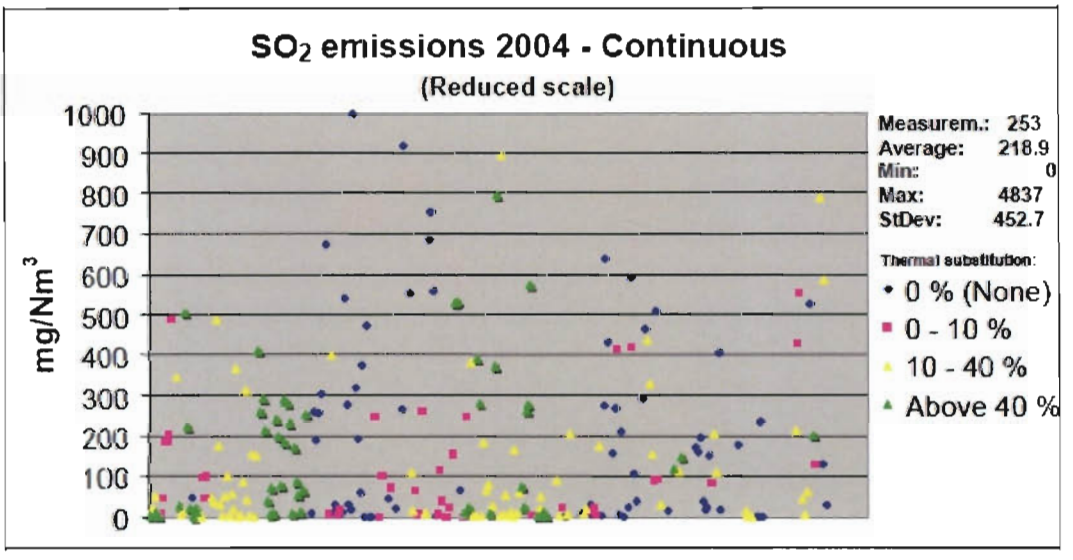


Figure 1.32: Values of SO_2 measurements in the clean gas from cement plants in the EU-27 and EU-23+ countries

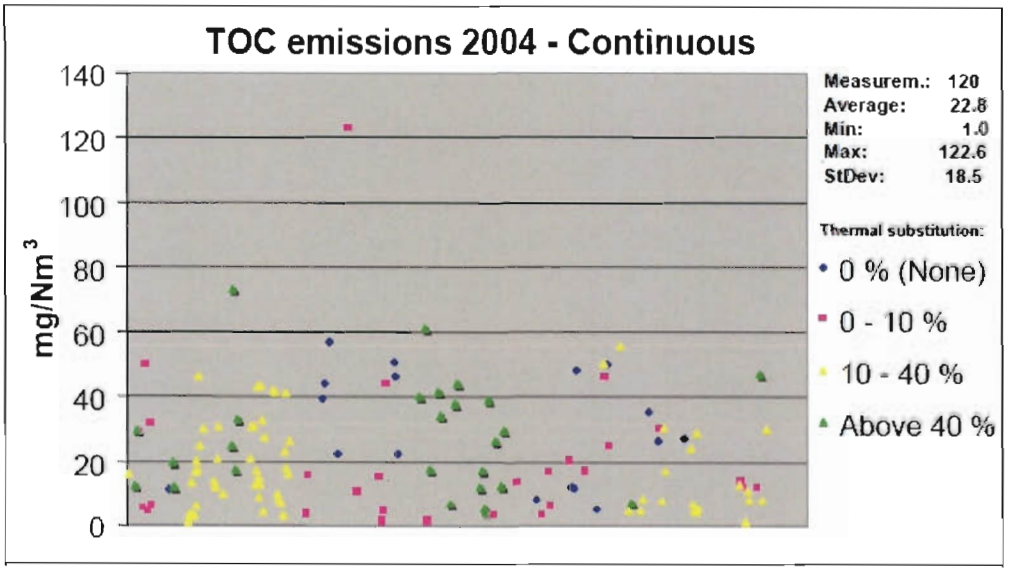


Figure 1.35: **TOC emission values from continuous measurements in the clean gas of cement kilns in the EU-27 and EU-23+ countries**

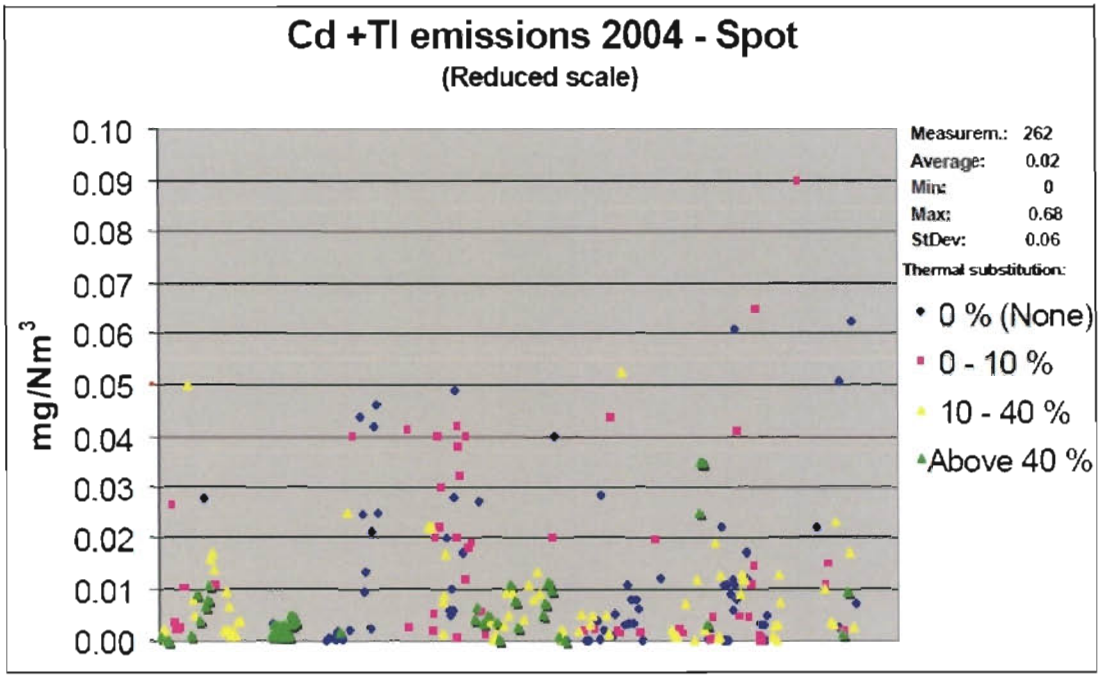


Figure 1.42: Cadmium and thallium emission values from 262 spot ∑ (Cd, Tl) measurements in the EU-27 and EU-23+ countries

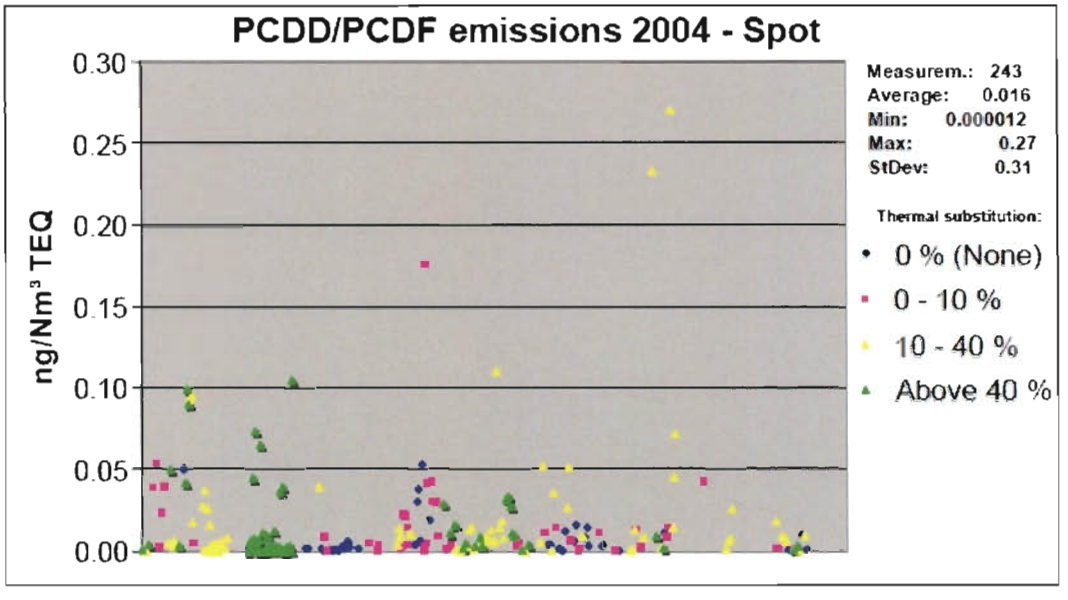


Figure 1.38: Emissions of PCDD/F in the EU-27 and EU-23+ countries in 2004 categorised by thermal substitution rate

PSD Analysis – Coal (non-specific)

Representative data of emissions from bituminous coal are applied for comparison to other forms of coal. The similarity of applicable coals that would be used in the kiln system are such the projected emissions would be the same.

The following table shows baseline emissions from bituminous coal. Note that the new kiln system was operational from 2005 onward.

Table 3. Summary of Baseline Emissions for coal.

Baseline Emissions Calculations

Operational Parameters*

Month	Clinker Production (Coal-Fired)	MMBtu (Coal (26 mmbtu/ton))	Fuel Usage Tons (Coal)
2005	1,591,615 ton/yr	4,322,812 MMBtu/yr	166,262 ton/yr
2006	1,714,239 ton/yr	4,786,366 MMBtu/yr	184,091 ton/yr
2007	1,390,239 ton/yr	3,647,384 MMBtu/yr	140,284 ton/yr
2008	1,259,556 ton/yr	3,737,838 MMBtu/yr	143,763 ton/yr
2009	808,512 ton/yr	2,374,372 MMBtu/yr	91,322 ton/yr
2010	712,691 ton/yr	1,955,824 MMBtu/yr	75,224 ton/yr
average		3,470,766 MMBtu/yr	

CEM Data

Nitrogen Oxides

	Lbs NO_x/ton Clinker	Lbs NO_x/ mmbtu	
2005	2.11	0.778	1682.30 ton/yr
2006	2.05	0.734	1757.1 ton/yr
2007	2.15	0.820	1494.7 ton/yr
2008	1.95	0.657	1228.6 ton/yr
2009	2.07	0.704	835.7 ton/yr
2010	1.92	0.699	683.4 ton/yr
Baseline Emissions			1719.7 ton/yr
	average	0.7320	

Volatile Organic Compounds

	Lbs VOC/ton Clinker	Lbs VOC/ mmbtu	
2005	0.0736	0.0271	58.60 ton/yr
2006	0.1205	0.0432	103.3 ton/yr
2007	0.0732	0.0279	50.9 ton/yr
2008	0.0929	0.0313	58.5 ton/yr
2009	0.1086	0.0370	43.9 ton/yr
2010	0.1167	0.0425	41.6 ton/yr
			81.0 ton/yr
	average	0.0348	

Sulfur Dioxide

	Lbs SO2/ton Clinker	Lbs SO2/ mmbtu	
2005	0.0028	0.00102	2.20 ton/yr
2006	0.0064	0.00230	5.5 ton/yr
2007	0.0234	0.00894	16.3 ton/yr
2008	0.0080	0.00271	5.1 ton/yr
2009	0.0119	0.00404	4.8 ton/yr
2010	0.0043	0.00155	1.5 ton/yr
Baseline Emissions			10.9 ton/yr
	average	0.0034	

Carbon Monoxide

	Lbs CO/ton Clinker	Lbs CO/ mmbtu	
2005			3.40 ton/yr
2006	0.8516	0.3050	729.9 ton/yr
2007	1.0420	0.3972	724.3 ton/yr
2008	1.1320	0.3815	712.9 ton/yr
2009	1.3008	0.4430	525.9 ton/yr
2010	1.3984	0.5096	498.3 ton/yr
			727.1 ton/yr
	average	0.4072	

Baseline Emissions Calculations -continued

Stack Test

Particulate Matter

	Lbs PM/ton Clinker	Lbs PM/ mmbtu	
2005	0.0591	0.02175	47.0 ton/yr
2006	0.0590	0.02114	50.6 ton/yr
2007	0.0590	0.02248	41.0 ton/yr
2008	0.0726	0.02445	45.7 ton/yr
2009	0.0633	0.02156	25.6 ton/yr
2010	0.0623	0.02270	22.2 ton/yr

Particulate Matter

5-year average	Lbs PM/ton Clinker	Lbs PM/ mmbtu	
2005	0.0591	0.0217	47.0 ton/yr
2005-2006	0.0590	0.0214	48.8 ton/yr
2005-2007	0.0590	0.0218	46.2 ton/yr
2005-2008	0.0624	0.0225	46.1 ton/yr
2005-2009	0.0626	0.0223	42.0 ton/yr
2006-2010	0.0632	0.0225	37.0 ton/yr
Baseline Emissions			47.9 ton/yr
	average	0.0220	

Stack Test

Particulate Matter 10 (85% PM)

	Lbs PM10/ton Clinker	Lbs PM10/ mmbtu	
2005	0.0502	0.0185	40.0 ton/yr
2006	0.0502	0.0180	43.0 ton/yr
2007	0.0501	0.0191	34.9 ton/yr
2008	0.0617	0.0208	38.8 ton/yr
2009	0.0538	0.0183	21.8 ton/yr
2010	0.0530	0.0193	18.9 ton/yr

Particulate Matter 10 (85% PM)

	Lbs PM10/ton Clinker	Lbs PM10/ mmbtu	
2005	0.0502	0.0185	40.0 ton/yr
2005-2006	0.0502	0.0182	41.5 ton/yr
2005-2007	0.0502	0.0185	39.3 ton/yr
2005-2008	0.0530	0.0191	39.2 ton/yr
2005-2009	0.0532	0.0189	35.7 ton/yr
2006-2010	0.0538	0.0191	31.5 ton/yr
			40.7 ton/yr
	average	0.0187	

ENGINEERED FUEL

Engineered fuel is comprised of materials such as those included in the list of requested materials (e.g. clean cellulosic biomass) and other non-hazardous materials to meet a fuel design specification that allows Tarmac to ensure it will meet regulatory limits as discussed in the Regulatory analysis section and quality control purposes. Tarmac will work with Engineered fuel supplier companies, such as PEER (in coordination with FLSmidth – see Appendix 2 for example engineered fuel creation) or VEXOR as a contracted provider to meet the specifications.

PSD Analysis – Engineered fuel

The PSD analysis for engineered fuel is based on the results of studies at the Cemex UK Rugby cement plant. Results of this study are attached (see appendix 2). The emission results from this study show that emissions are either the same or reduced when burning engineered fuel. For the PSD analysis, the emission factors for coal and engineered fuel are estimated to be the same.

Table 4. Summary of Emissions from Engineered fuel.

Engineered Fuel

Material Comparison:

	Coal (wet)	Material (wet)	
typical Moisture Content	5.00%	10%	percent
typical Heat Content	13,000	7,000	btu/lb
typical Heat Content	26.0	14	mmbtu/ton

Emissions Comparison:

		Coal Emission factor	Test Material Emiss Factor	Projected heat input[c]	Projected Actual Emissions	Baseline Actual Emissions	Difference in Emissions
		(lb/mmbtu)	(lb/mmbtu)	mmbtu/yr	(tons/yr)	(tons/yr)	(tons)
SO_2	Test Material[a]		0.0034	3470766	5.9		-5.0
	Coal Equivalent[b]	0.0034				10.9	
NO_x	Test Material[a]		0.7320	3470766	1270.4		-449.3
	Coal Equivalent[b]	0.7320				1719.7	
CO	Test Material[a]		0.4072	3470766	706.7		-1045.4
	Coal Equivalent[b]	0.4072				1752.1	
VOC	Test Material[a]		0.0348	3470766	60.5		-20.5
	Coal Equivalent[b]	0.0348				81.0	
PM	Test Material[a]		0.0220	3470766	38.2		-9.7
	Coal Equivalent[b]	0.0220				47.9	

a. Emission Factor (EF): Test material emissions estimated to be no greater than coal
b. EF: Based on CEM data and stack test data (see Baseline Emissions Calculations sheet)
c. Projected heat input based on 2005-2010 average, (see Baseline Emissions Calculations sheet)

TIRE-DERIVED FUEL (TDF) INCLUDING TIREFLUFF

This material must consist of shredded used tires and may have some steel belt material. The TDF may include tirefluff. Tires are readily available and have a higher heating value than coal. The high temperatures, long residence times, and inherent scrubbing that take place within a cement kiln provide an environment conducive to the efficient combustion of tires. For these reasons, firing tire-derived fuels (TDF) in cement kilns has become relatively common practice in Florida. Combustion of TDF alleviates problems associated with the stockpiling or landfilling of waste tires. Use of TDF at cement kilns in Florida is approved at the following cement production facilities: Florida Rock Industries - Newberry , Cemex - Miami, Cemex - Brooksville South and North, and American Cement Company - Sumter.

The following table is from the FDEP Technical Evaluation for the Kiln 2 project at Brooksville North, permit number 0530010-022-AC. This FDEP information indicates that tires and tire-derived fuel should either not change or reduce emissions except zinc.

Table 5. General Expected Effects of TDF On Emissions

Pollutant	Expected Effect of TDF/Scrap Tire
CO	None
SO2	None
NOx	Decrease
PM	None
Total Hydrocarbons	None
Zinc	Increase
Other Metals	None or Decrease
Dioxins/Furans	None
Benzene	Decrease
Formaldehyde	Decrease
Semi-volatiles	Decrease

The above results are consistent with a USEPA report citing that "with the exception of zinc emissions, potential emissions from TDF are not expected to be very much different from other conventional fossil fuels, as long as combustion occurs in a well-designed, well-operated, and well-maintained combustion device".[Emphasis added.] The data above is also consistent with claims of NO_x reductions as a result of firing TDF. [0530010-022-AC]

PSD Analysis – TDF

Plant data are available for tires, which is the source material of tirefluff. Estimated emissions calculations are based on whole tire burning at the Pennsuco Cement Plant. The information found in Table 7, below, was extrapolated, applying the percent increase or decrease in emissions found to an equivalent baseline factor.

Table 6. Tire-Derived Fuel Emissions – Direct Comparison

Tire-Derived Fuel Emissions - Direct Comparison
Tarmac America LLC, Pennsuco Cement Plant

	Measured Stack Emissions (lb/ton clinker)				
Tires & Coal Co-Firing	SO_2	NO_x	CO	VOC	PM
Tarmac Stack Test (09/22/09)	--	--	--	--	0.035
Tarmac Stack Test (09/26/09)	--	--	--	--	0.040
Tarmac Stack Test (11/09/09)	--	--	--	--	0.044
Tarmac Stack Test (11/14/09)	--	--	--	--	0.06
Tarmac Stack Test (07/26/10)	--	--	--	--	0.035
Tarmac Stack Test (07/27/10)	--	--	--	--	0.053
Tarmac Stack Test (11/16/10)	--	--	--	--	0.042
Tarmac Stack Test (11/17/10)	--	--	--	--	0.035
Tarmac 2010 CEMS	0.011	1.922	1.534	0.100	--
EF =	0.011	1.922	1.534	0.100	0.043

	Measured Stack Emissions (lb/ton clinker)				
Coal-Fired Only (No Tires)	SO_2	NO_x	CO	VOC	PM
Tarmac 5 Year Stack Test Average	--	--	--	--	0.0415
Tarmac 2010 CEMS	0.012	1.964	1.409	0.125	--
EF =	0.012	1.964	1.409	0.125	0.042

Comparative Percent Change of Emissions When Firing Tires versus Coal-only				
SO_2	NO_x	CO	VOC	PM
-14%	**-2%**	**9%**	**-20%**	**4%**

Table 7. Estimated Emissions for TDF

Tire Derived Fuel

Material Comparison:

	Coal (wet)	Material (wet)	
typical Moisture Content	5.00%	0.5%	percent
typical Heat Content	13,000	13,800	btu/lb
typical Heat Content	26.0	27.6	mmbtu/ton

Emissions Comparison:

		Coal Emission factor	Test Material Emiss Factor	Projected heat input[c]	Projected Actual Emissions	Baseline Actual Emissions	Difference in Emissions
		(lb/mmbtu)	(lb/mmbtu)	mmbtu/yr	(tons/yr)	(tons/yr)	(tons)
SO_2	Test Material[a]		0.0030	3470766	5.1		-5.8
	Coal Equivalent[b]	0.0034				10.9	
NO_x	Test Material[a]		0.7162	3470766	1242.9		-476.8
	Coal Equivalent[b]	0.7320				1719.7	
CO	Test Material[a]		0.4432	3470766	769.1		-983.0
	Coal Equivalent[b]	0.4072				1752.1	
VOC	Test Material[a]		0.0278	3470766	48.2		-32.8
	Coal Equivalent[b]	0.0348				81.0	
PM	Test Material[a]		0.0228	3470766	39.6		-8.3
	Coal Equivalent[b]	0.0220				47.9	

a. Emission Factor (EF): Test material adjusted for percent change of emissions when burning tires, see Table 6.
b. EF: Based on CEM data and stack test data (see Baseline Emissions Calculations sheet)
c. Projected heat input based on 2005-2010 average, (see Baseline Emissions Calculations sheet)

AGRICULTURAL FILM

Agricultural film is used in agriculture and silviculture to prevent weed growth, control soil erosion and moisture exposure. The film is a composed of polyethylene, non-chlorinated plastics. The energy content per ton for these films is near 50 percent higher than coal. The high temperatures, long residence times, and inherent scrubbing that take place within a cement kiln calciner provides an environment conducive to the efficient combustion of this film. Currently, agricultural film is disposed in landfills or open burned in fields.

PSD Analysis – Agricultural film

Data are not currently available for emissions from agricultural film burning in cement kilns; however the film is a petroleum-based polyethylene product manufactured to specification. Estimated emissions calculations are based on the whole tire burning at the Pennsuco Cement Plant. Tires are similarly manufactured from petroleum. Given the lack of testing data, these emissions are the best available comparison.

Table 8. Estimated Emissions for Agricultural Film.

Agricultural Film

Material Comparison:

	Coal (wet)	Material (wet)	
typical Moisture Content	5.00%	0.5%	percent
typical Heat Content	13,000	18,600	btu/lb
typical Heat Content	26.0	37.2	mmbtu/ton

Emissions Comparison:

		Coal Emission factor	Test Material Emiss Factor	Projected heat input[c]	Projected Actual Emissions	Baseline Actual Emissions	Difference in Emissions
		(lb/mmbtu)	(lb/mmbtu)	mmbtu/yr	(tons/yr)	(tons/yr)	(tons)
SO_2	Test Material[a]		0.0030	3470766	5.1		-5.8
	Coal Equivalent[b]	0.0034				10.9	
NO_x	Test Material[a]		0.7162	3470766	1242.9		-476.8
	Coal Equivalent[b]	0.7320				1719.7	
CO	Test Material[a]		0.4432	3470766	769.1		-983.0
	Coal Equivalent[b]	0.4072				1752.1	
VOC	Test Material[a]		0.0278	3470766	48.2		-32.8
	Coal Equivalent[b]	0.0348				81.0	
PM	Test Material[a]		0.0228	3470766	39.6		-8.3
	Coal Equivalent[b]	0.0220				47.9	

a. Emission Factor (EF): Test material adjusted for percent change of emissions when burning tires, see Table 6.
b. EF: Based on CEM data and stack test data (see Baseline Emissions Calculations sheet)
c. Projected heat input based on 2005-2010 average, (see Baseline Emissions Calculations sheet)

AGRICULTURAL BYPRODUCTS

This material include organic materials from agricultural operations such as peanut hulls, rice hulls, corn husks, citrus peels, cotton gin byproducts, animal bedding, etc. These materials are typically of little value to farmers. The materials can provide significant heat content and other parameters acceptable for kiln firing.

PSD Analysis – Agricultural byproducts

These materials have organic content and composition that is similar to cellulosic biomass. Therefore, the PSD analysis is based on the data applied for biomass.

Table 9. Estimated Emissions for Agricultural Byproducts.

Agricultural Byproducts

Material Comparison:

	Coal (wet)	Material (wet)	
typical Moisture Content	5.00%	10%	percent
typical Heat Content	13,000	8,000	btu/lb
typical Heat Content	26.0	16	mmbtu/ton

Emissions Comparison:

		Coal Emission factor	Test Material Emiss Factor	Projected heat input [c]	Projected Actual Emissions	Baseline Actual Emissions	Difference in Emissions
		(lb/mmbtu)	(lb/mmbtu)	mmbtu/yr	(tons/yr)	(tons/yr)	(tons)
SO_2	Test Material[a]		0.0034	3470766	5.9		-5.0
	Coal Equivalent[b]	0.0034				10.9	
NO_x	Test Material[a]		0.7320	3470766	1270.4		-449.3
	Coal Equivalent[b]	0.7320				1719.7	
CO	Test Material[a]		0.4072	3470766	706.7		-1045.4
	Coal Equivalent[b]	0.4072				1752.1	
VOC	Test Material[a]		0.0348	3470766	60.5		-20.5
	Coal Equivalent[b]	0.0348				81.0	
PM	Test Material[a]		0.0220	3470766	38.2		-9.7
	Coal Equivalent[b]	0.0220				47.9	

a. Emission Factor (EF): Test material emissions estimated to be no greater than coal
b. EF: Based on CEM data and stack test data (see Baseline Emissions Calculations sheet)
c. Projected heat input based on 2005-2010 average, (see Baseline Emissions Calculations sheet)

CARPET DERIVED FUEL

In the US, approximately 2 million tons of carpet is replaced annually. Most carpet is disposed of in landfills. Carpet is composed in part of non-chlorinated plastic and has an overall heating value similar to that of coal, and carpet contains a significant fraction (≈ 30 % by weight) of CaCO3 in the backing material which is a beneficial component of cement production.[15]

PSD Analysis – CDF

Limited data are available for carpet derived fuel. The referenced emission data (14) provides reasonable assurance of emissions comparable to coal. Given the results of the testing show emissions are the same if not lower, the emissions estimates for carpet derived fuel are estimated to be the same as for coal.

Table 10. Estimated Emissions for CDF.

Carpet Derived Fuel

Material Comparison:

	Coal (wet)	Material (wet)	
typical Moisture Content	5.00%	10%	percent
typical Heat Content	13,000	8,000	btu/lb
typical Heat Content	26.0	16	mmbtu/ton

Emissions Comparison:

		Coal Emission factor	Test Material Emiss Factor	Projected heat input[c]	Projected Actual Emissions	Baseline Actual Emissions	Difference in Emissions
		(lb/mmbtu)	(lb/mmbtu)	mmbtu/yr	(tons/yr)	(tons/yr)	(tons)
SO_2	Test Material[a]		0.0034	3470766	5.9		-5.0
	Coal Equivalent[b]	0.0034				10.9	
NO_x	Test Material[a]		0.7320	3470766	1270.4		-449.3
	Coal Equivalent[b]	0.7320				1719.7	
CO	Test Material[a]		0.4072	3470766	706.7		-1045.4
	Coal Equivalent[b]	0.4072				1752.1	
VOC	Test Material[a]		0.0348	3470766	60.5		-20.5
	Coal Equivalent[b]	0.0348				81.0	
PM	Test Material[a]		0.0220	3470766	38.2		-9.7
	Coal Equivalent[b]	0.0220				47.9	

a. Emission Factor (EF): Test material emissions estimated to be no greater than coal
b. EF: Based on CEM data and stack test data (see Baseline Emissions Calculations sheet)
c. Projected heat input based on 2005-2010 average, (see Baseline Emissions Calculations sheet)

[15] Carpet Derived Fuel - Emissions from Combustion of Post-consumer Carpet in a cement Kiln, P Lemieux, et al. , IT3 conference 2005. Paper for presentation at the 2005 Conference on Incineration and Thermal Treatment Technologies, Galveston, TX, May 9-13, 2005

CELLULOSIC BIOMASS

Tarmac is proposing two categories of cellulosic biomass. The first category is clean cellulosic biomass as defined in 40 CFR 241.2. The second category is "other" cellulosic biomass which does not meet the definition of clean cellulosic biomass. For example other cellulosic biomass would include copper-chromium-arsenic (CCA)-treated wood, creosote-treated wood, construction and demolition (C&D) debris not meeting the definition of clean C&D wood per 40 CFR Part 241, plywood, particle board, medium density fiberboard, oriented strand board, laminated beams, finger-jointed trim and sheet goods. Other cellulosic biomass will be comparable to conventional fuels that the unit is designed to burn.

PSD Analysis – cellulosic biomass

Data are available for cellulosic biomass in cement kilns as discussed for agricultural byproducts.

Table 11. Estimated Emissions for Cellulosic Biomass.

Woody Biomass

Material Comparison:

	Coal (wet)	Material (wet)	
typical Moisture Content	5.00%	40%	percent
typical Heat Content	13,000	5,200	btu/lb
typical Heat Content	26.0	10	mmbtu/ton

Emissions Comparison:

		Coal Emission factor	Test Material Emiss Factor	Projected heat input[c]	Projected Actual Emissions	Baseline Actual Emissions	Difference in Emissions
		(lb/mmbtu)	(lb/mmbtu)	mmbtu/yr	(tons/yr)	(tons/yr)	(tons)
SO_2	Test Material[a]		0.0034	3470766	5.9		-5.0
	Coal Equivalent[b]	0.0034				10.9	
NO_x	Test Material[a]		0.7320	3470766	1270.4		-449.3
	Coal Equivalent[b]	0.7320				1719.7	
CO	Test Material[a]		0.4072	3470766	706.7		-1045.4
	Coal Equivalent[b]	0.4072				1752.1	
VOC	Test Material[a]		0.0348	3470766	60.5		-20.5
	Coal Equivalent[b]	0.0348				81.0	
PM	Test Material[a]		0.0220	3470766	38.2		-9.7
	Coal Equivalent[b]	0.0220				47.9	

a. Emission Factor (EF): Test material emissions estimated to be no greater than coal
b. EF: Based on CEM data and stack test data (see Baseline Emissions Calculations sheet)
c. Projected heat input based on 2005-2010 average, (see Baseline Emissions Calculations sheet)

SHINGLES, MANUFACTURER REJECTS

Manufacturers of asphalt roofing shingles reject a certain fraction of roofing shingle product. This product contains valuable heat content and raw materials of a very consistent composition. This material is an excellent source of raw material and heat content for cement production. Shingles are no longer manufactured with asbestos and the manufacturer will provide written certification of this assertion.

PSD Analysis – Shingles

There are no data for emissions comparison of fuel from shingles. Shingles are a petroleum based product. The resulting emissions would be similar to an oil or other petroleum product. As such, similar to agricultural film, the same emissions from coal are used for shingles.

Table 12. Estimated Emissions for Shingles.

Shingles

Material Comparison:

	Coal (wet)	Material (wet)	
typical Moisture Content	5.00%	3.1%	percent
typical Heat Content	13,000	5,842	btu/lb
typical Heat Content	26.0	11.7	mmbtu/ton

Emissions Comparison:

		Coal Emission factor (lb/mmbtu)	Test Material Emiss Factor (lb/mmbtu)	Projected heat input[c] mmbtu/yr	Projected Actual Emissions (tons/yr)	Baseline Actual Emissions (tons/yr)	Difference in Emissions (tons)
SO_2	Test Material[a]		0.0030	3470766	5.1		-5.8
	Coal Equivalent[b]	0.0034				10.9	
NO_x	Test Material[a]		0.7162	3470766	1242.9		-476.8
	Coal Equivalent[b]	0.7320				1719.7	
CO	Test Material[a]		0.4432	3470766	769.1		-983.0
	Coal Equivalent[b]	0.4072				1752.1	
VOC	Test Material[a]		0.0278	3470766	48.2		-32.8
	Coal Equivalent[b]	0.0348				81.0	
PM	Test Material[a]		0.0228	3470766	39.6		-8.3
	Coal Equivalent[b]	0.0220				47.9	

a. Emission Factor (EF): Test material adjusted for percent change of emissions when burning tires, see Table 6.
b. EF: Based on CEM data and stack test data (see Baseline Emissions Calculations sheet)
c. Projected heat input based on 2005-2010 average, (see Baseline Emissions Calculations sheet)

PRE-CONSUMER PAPER

Pre-consumer reject paper is produced by companies specifically marketing such a products (e.g., International Paper Products Corp (IPP), enviro-fuelcubes) or waste handlers that certify and manifest to only supply pre-consumer reject paper. Typical sources of such paper are manufacturers having a supply of outdated paper printings (e.g., calendars) that must dispose of the material in some manner. Example material sources are listed below. The obvious benefit of these materials is that consumers have not been able to potentially contaminate the paper. As such the quality of the product is much more reliable and the potential to contamination (e.g., mercury containing materials) is essentially negated.

These materials contain high amounts of energy, are relatively slow to biodegrade in landfills and have been successfully used at cement facilities in the US and around the world.

FEEDSTOCK MATERIAL & EXAMPLES	TYPICAL SOURCES
PAPER	
Printing &Writing Paper	Original Article Manufacturers
Pre-Consumer Household & Sanitary Paper	Paper Goods Manufacturers and Converters
Wrapping & Packaging Paper and Paper Board	Game/Novelty Manufacturers/Distributors
Linerboard (chipboard)	Packaging Operations
Kraft Liner	Commercial and Retail Packaging Discards
Fluting (corrugated interiors)	Institutional Discards
Kraft Wrapping & Packaging	References www.fao.org/ http://www.fao.org/docrep/w5622t/w5622t4o.htm
Other Wrapping and Packaging Paper	

PSD Analysis – Paper

The organic content of paper is similar to a wood product. As such, the emissions of paper should be similar to that of biomass.

Table 13. Estimated Emissions for paper.

Paper

Material Comparison:

	Coal (wet)	Material (wet)	
typical Moisture Content	5.00%	40%	percent
typical Heat Content	13,000	5,200	btu/lb
typical Heat Content	26.0	10	mmbtu/ton

Emissions Comparison:

		Coal Emission factor	Test Material Emiss Factor	Projected heat input[c]	Projected Actual Emissions	Baseline Actual Emissions	Difference in Emissions
		(lb/mmbtu)	(lb/mmbtu)	mmbtu/yr	(tons/yr)	(tons/yr)	(tons)
SO_2	Test Material[a]		0.0034	3470766	5.9		-5.0
	Coal Equivalent[b]	0.0034				10.9	
NO_x	Test Material[a]		0.7320	3470766	1270.4		-449.3
	Coal Equivalent[b]	0.7320				1719.7	
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	Coal Equivalent[b]	0.4072				1752.1	
VOC	Test Material[a]		0.0348	3470766	60.5		-20.5
	Coal Equivalent[b]	0.0348				81.0	
PM	Test Material[a]		0.0220	3470766	38.2		-9.7
	Coal Equivalent[b]	0.0220				47.9	

a. Emission Factor (EF): Test material emissions estimated to be no greater than coal
b. EF: Based on CEM data and stack test data (see Baseline Emissions Calculations sheet)
c. Projected heat input based on 2005-2010 average, (see Baseline Emissions Calculations sheet)


TDK
700MB 80min
UP TO 52x SPEED
TARMAC
4/19/11