Florida Department of Environmental Regulation

Twin Towers Office Bldg. ● 2600 Blair Stone Road ● Tallahassee, Florida 32399-2400

Bob Martinez, Governor | Dale Twachtmann, Secretary | John Shearer, Assistant Secretary

March 29, 1990

CERTIFIED MAIL-RETURN RECEIPT REQUESTED

Scott Quaas
Environmental Specialist
Tarmac Florida, Inc.
P. O. Box 2998
Hialeah, Florida 33012

Dear Mr. Quaas:

Attached is one copy of the Technical Evaluation and Preliminary Determination and proposed permit for Tarmac Florida, Inc., to convert kiln No. 2 to coal firing at their facility in Medley, Dade County, Florida.

Please submit any written comments you wish to have considered concerning the Department's proposed action to Mr. Bill Thomas of the Bureau of Air Regulation.

Sincerely,

C. H. Fancy, P.E.
Chief
Bureau of Air Regulation

CHF/JR/plm

Attachments

c: I. Goldman, SE District
D. Buff, P.E.
M. Armentrout, EPA
E. Anderson, DCDERM

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BEFORE THE STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION

In the Matter of
Application for Permit by:

Tarmac Florida, Inc.
P. O. Box 2998
Hialeah, Florida 33012

DER File No. AC 13-169901
PSD-FL-142

INTENT TO ISSUE

The Department of Environmental Regulation hereby gives notice of its intent to issue a permit (copy attached) for the proposed project as detailed in the application specified above. The Department is issuing this Intent to Issue for the reasons stated in the attached Technical Evaluation and Preliminary Determination.

The applicant, Tarmac Florida, Inc., applied on November 14, 1989, to the Department of Environmental Regulation for a permit to convert their kiln No. 2 to coal firing at their facility in Medley, Dade County, Florida.

The Department has permitting jurisdiction under Chapter 403, Florida Statutes, and Florida Administrative Code Chapters 17-2 and 17-4. The project is not exempt from permitting procedures. The Department has determined that an air construction permit is required for the proposed work.

Pursuant to Section 403.815, F.S. and DER Rule 17-103.150, F.A.C., you (the applicant) are required to publish at your own expense the enclosed Notice of Intent to Issue Permit. The notice shall be published one time only within 30 days, in the legal ad section of a newspaper of general circulation in the area affected. For the purpose of this rule, "publication in a newspaper of general circulation in the area affected" means publication in a newspaper meeting the requirements of Sections 50.011 and 50.031, F.S., in the county where the activity is to take place. The applicant shall provide proof of publication to the Department, at the address specified within seven days of publication. Failure to publish the notice and provide proof of publication within the allotted time may result in the denial of the permit.

The Department will issue the permit with the attached conditions unless a petition for an administrative proceeding (hearing) is filed pursuant to the provisions of Section 120.57, F.S.

A person whose substantial interests are affected by the Department's proposed permitting decision may petition for an administrative proceeding (hearing) in accordance with Section 120.57, Florida Statutes. The petition must contain the information set forth below and must be filed (received) in the Office of General Counsel of the Department at 2600 Blair Stone Road, Tallahassee, Florida 32399-2400. Petitions filed by the permit applicant and the parties listed below must be filed within 14 days of receipt of this intent. Petitions filed by other persons must be filed within 14 days of publication of the public notice or within 14 days of receipt of this intent, whichever first occurs. Petitioner shall mail a copy of the petition to the applicant at the address indicated above at the time of filing. Failure to file a petition within this time period shall constitute a waiver of any right such person may have to request an administrative determination (hearing) under Section 120.57, Florida Statutes.

The Petition shall contain the following information;

(a) The name, address, and telephone number of each petitioner, the applicant's name and address, the Department Permit File Number and the county in which the project is proposed;

(b) A statement of how and when each petitioner received notice of the Department's action or proposed action;

(c) A statement of how each petitioner's substantial interests are affected by the Department's action or proposed action;

(d) A statement of the material facts disputed by Petitioner, if any;

(e) A statement of facts which petitioner contends warrant reversal or modification of the Department's action or proposed action;

(f) A statement of which rules or statutes petitioner contends require reversal or modification of the Department's action or proposed action; and

(g) A statement of the relief sought by petitioner, stating precisely the action petitioner wants the Department to take with respect to the Department's action or proposed action.

If a petition is filed, the administrative hearing process is designed to formulate agency action. Accordingly, the Department's final action may be different from the position taken by it in this notice. Persons whose substantial interests will be affected by any decision of the Department with regard to the application(s) have the right to petition to become a party to the proceeding. The petition must conform to the requirements specified above and be filed (received) within 14 days of publication of this notice in the Office in General Counsel at the above address of the Department. Failure to petition within the allowed time frame constitutes a waiver of any right such

person has to request a hearing under Section 120.57, F.S., and to participate as a party to this proceeding. Any subsequent intervention will only be at the approval of the presiding officer upon motion filed pursuant to Rule 28-5.207, F.A.C.

Executed in Tallahassee, Florida.

STATE OF FLORIDA DEPARTMENT
OF ENVIRONMENTAL REGULATION

C. H. Fancy, P.E.
Chief
Bureau of Air Regulation

Copies furnished to:

I. Goldman, SE District
D. Buff, P.E.
M. Armentrout, EPA
E. Anderson, DCDERM

CERTIFICATE OF SERVICE

The undersigned duly designated deputy clerk hereby certifies that this NOTICE OF INTENT TO ISSUE and all copies were mailed before the close of business on 3-30-90.

FILING AND ACKNOWLEDGEMENT
FILED, on this date, pursuant to §120.52(9), Florida Statutes, with the designated Department Clerk, receipt of which is hereby acknowledged.

Kim Oaber
Clerk

3-30-90
Date

State of Florida
Department of Environmental Regulation
Notice of Intent to Issue

The Department of Environmental Regulation hereby gives notice of its intent to issue a permit to Tarmac Florida, Inc., 11000 NW 121 Way, Medley, Florida 33012, to convert kiln No. 2 to coal firing at their facility in Dade County, Florida. A determination of Best Available Control Technology (BACT) was required. The proposed project is subject to Prevention of Significant Deterioration (PSD) regulations. Significant net increases in emissions of sulfur dioxide, nitrogen oxides, and sulfuric acid mist will result from this project. The Class I nitrogen dioxide PSD increment consumed is 0.02 micrograms per cubic meter (1 percent of allowable increment of 2.5 micrograms per cubic meter, annual average). The Class I sulfur dioxide PSD increment consumed is 18.5 vs. 25 allowable 3-hour average, 4.1 vs. 5 allowable 24-hour average, and 0.6 vs. 2 allowable annual average, in micrograms per cubic meter, respectively. Class II nitrogen dioxide PSD increment consumption is 0.5 vs. 25 allowable annual average, in micrograms per cubic meter. Class II sulfur dioxide PSD increment consumption is 162.1 vs. 512 allowable 3-hour average, 55.1 vs. 91 allowable 24-hour average, and 5.1 us. 20 allowable annual average in micrograms per cubic meter, respectively. These emission increases are not expected to cause or contribute to a violation of any ambient air quality standard. The Department is issuing this Intent to Issue for the reasons stated in the Technical Evaluation and Preliminary Determination.

A person whose substantial interests are affected by the Department's proposed permitting decision may petition for an administrative proceeding (hearing) in accordance with Section 120.57, Florida Statutes. The petition must contain the information set forth below and must be filed (received) in the Office of General Counsel of the Department at 2600 Blair Stone Road, Tallahassee, Florida 32399-2400, within fourteen (14) days of publication of this notice. Petitioner shall mail a copy of the petition to the applicant at the address indicated above at the time of filing. Failure to file a petition within this time period shall constitute a waiver of any right such person may have to request an administrative determination (hearing) under Section 120.57, Florida Statutes.

The Petition shall contain the following information:

(a) The name, address, and telephone number of each petitioner, the applicant's name and address, the Department Permit File Number and the county in which the project is proposed;
(b) A statement of how and when each petitioner received notice of the Department's action or proposed action;
(c) A statement of how each petitioner's substantial interests are affected by the Department's action or proposed action;

(d) A statement of the material facts disputed by Petitioner, if any;

(e) A statement of facts which petitioner contends warrant reversal or modification of the Department's action or proposed action;

(f) A statement of which rules or statutes petitioner contends require reversal or modification of the Department's action or proposed action; and

(g) A statement of the relief sought by petitioner, stating precisely the action petitioner wants the Department to take with respect to the Department's action or proposed action.

If a petition is filed, the administrative hearing process is designed to formulate agency action. Accordingly, the Department's final action may be different from the position taken by it in this Notice. Persons whose substantial interests will be affected by any decision of the Department with regard to the application have the right to petition to become a party to the proceeding. The petition must conform to the requirements specified above and be filed (received) within 14 days of publication of this notice in the Office of General Counsel at the above address of the Department. Failure to petition within the allowed time frame constitutes a waiver of any right such person has to request a hearing under Section 120.57, F.S., and to participate as a party to this proceeding. Any subsequent intervention will only be at the approval of the presiding officer upon motion filed pursuant to Rule 28-5.207, F.A.C.

The application is available for public inspection during business hours, 8:00 a.m. to 5:00 p.m., Monday through Friday, except legal holidays, at:

Department of Environmental Regulation
Bureau of Air Regulation
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Department of Environmental Regulation
Southeast District Office
1900 S. Congress Ave., Suite A
West Palm Beach, Florida 33406

Dade County Department of Environmental
Resources Management
801 S.W. 3rd Avenue, 2nd Floor
Miami, Florida 33130

Any person may send written comments on the proposed action to Mr. Bill Thomas at the Department's Tallahassee address. All comments mailed within 30 days of the publication of this notice will be considered in the Department's final determination. Furthermore, a public hearing can be requested by any person. Such requests must be submitted within 30 days of this notice.

I. Application

A. Applicant

Tarmac Florida, Inc.
P. O. Box 2998
Hialeah, Florida 33012

B. Request

The Department received a complete application on November 14, 1989, for a permit to convert kiln No. 2 to coal firing at the applicant's portland cement manufacturing facility in Medley, Dade County, Florida.

C. Classification/Location

The applicant's portland cement manufacturing facility (SIC Code 3241) is located south of the intersection of U.S. Highway 27 and State Road 821 near Medley, Florida, with latitude of 25°52'30"N and longitude of 80°22'30"W. The UTM coordinates of the site are: Zone 17, 562.8 km E and 2861.7 km N.

II. Project Description/Emissions

It is proposed to convert kiln No. 2 from burning natural gas or No. 6 fuel oil to firing coal. In 1980 the applicant applied for and received a federal PSD permit for the coal conversion of kiln No. 2 but, for various reasons, the coal conversion was not carried out. In 1984 the applicant obtained a revision of the emission limits in that permit. Now, the applicant wants to proceed with the coal conversion and has requested a substantial increase in the sulfur dioxide (SO_2) emission limits specified in the 1984 PSD permit revision. The applicant claims that the former SO_2 limits were not attainable and that this has been confirmed through extensive experience with burning coal in kiln No. 3.

Modifications to be accomplished by this project include installation of a new coal mill with totally enclosed conveyor transfer points, a new kiln chain system and a direct-fired coal burner. The project will utilize the existing kiln feed system, clinker cooler, clinker cooler electrostatic precipitator, dust insufflation system, and kiln electrostatic precipitator. The existing production capacity of 25 tons of clinker per hour will not be increased as a result of this project.

Emission changes from this modification are summarized in the following table:

Pollutant	Baseline Emissions (TPY)	Proposed Allowable Emissions (lb/hr)	(TPY)	Net Increase (TPY)	Significant Emissions (TPY)
PM(TSP)	42.48	14.40	56.76	18.58	25
SO_2	14.10	195.00	768.70	754.60	40
NO_x	396.90	113.80	448.40	51.50	40
VOC	73.7	28.8	113.5	39.8	40
H_2SO_4 Mist	0.42	5.86	23.06	22.64	7

III. Rule Applicability

The construction permit application is subject to review under Chapter 403, Florida Statutes, and Florida Administrative Code (F.A.C.) Chapters 17-2 and 17-4. The facility is located in an area classified as attainment for each of the regulated air pollutants except ozone for which the area is classified as nonattainment. The proposed modification is subject to the preconstruction review requirements of F.A.C. Rule 17-2.500, Prevention of Significant Deterioration (PSD). Certain of the proposed increases in emissions exceed significant levels set forth in Table 500-2 of F.A.C. Rule 17-2.500. Preconstruction review must include a determination of best available control technology (BACT), good-engineering practice stack height, ambient impact analysis, impact on soils, vegetation, and visibility. F.A.C. Rules 17-2.600(7) and Table 610-1, Process Weight Table, would apply except that the applicant has proposed a more stringent limit for particulate matter (TSP) emissions. Particulate matter emissions would have been limited by the federal new source performance standard for kiln gases set forth in 40 CFR 60, Subpart F, Standards of Performance for Portland Cement plants, except that the applicant states there will be no increase in actual particulate matter emissions from this modification. There are no specific limits for VOC emissions from coal combustion under the Reasonably Available Control Technology (RACT) rule (F.A.C. Rule 17-2.650). However, since the facility is located in an ozone nonattainment area and the emissions increase is 99.5 percent of the significant level (essentially significant), VOC emissions will be limited at the level estimated by the applicant. A Lowest Achievable Emission

Rate (LAER) determination would have been required had the estimated VOC emissions equalled or exceeded the significant level. Sulfur dioxide, nitrogen oxides, and sulfuric acid mist emissions will be limited by the BACT determination for those pollutants. ~~No limits are specified in the proposed permit for PM10, CO, lead or beryllium emissions due to their minimal ambient impacts discussed in the next section.~~

IV. Air Quality Impact Analysis

A. Introduction

The proposed conversion of Kiln 2 from burning natural gas to coal at the Tarmac plant, located in northwest Dade County, will cause increased emissions, in PSD-significant amounts, of five pollutants: nitrogen dioxide (NO2), sulfur dioxide (SO2), lead (Pb), beryllium (Be) and sulfuric acid mist.

The air quality impact analysis required by the PSD regulations for NO2, SO2, Pb, Be and sulfuric acid mist include:

* An analysis of existing air quality;
* A PSD increment analysis (NO2 and SO2 only);
* An Ambient Air Quality Standards (AAQS) analysis;
* An analysis of impacts on soils, vegetation, and visibility and of growth-related air quality impacts; and
* A "Good Engineering Practice" (GEP) stack height determination.

The analysis of existing air quality generally relies on preconstruction monitoring data collected with EPA-approved methods. The AAQS analysis depends on the air quality dispersion modeling carried out in accordance with EPA guidelines.

Based on the required analyses, the Department has reasonable assurance that the proposed modification to the Kiln 2 at the Tarmac facility, as described in this report and subject to the conditions of approval proposed herein, will not cause or contribute to a violation of any ambient air quality standard or PSD increment. A discussion of the modeling methodology and required analysis follows.

B. Modeling Methodology

The EPA-approved Industrial Source Complex Short-Term (ISCST) dispersion model was used in the air quality impact analysis. The applicant used the EPA recommended regulatory options in each modeling scenario.

The modeling used a radial receptor grid with the center of the grid coinciding with the center of the Tarmac facility's Kiln 2. Radials were spaced at 10 degree increments from 10 to 360

degrees. In order to avoid simulating downwash for directions in which the potential for downwash does not exist, the modeling analysis was separated into two cases. For those directions in which downwash potentially can occur for all three kiln stacks (i.e., 110 degrees through 150 degrees; 280 degrees through 300 degrees; and 310 degrees through 330 degrees) receptors were placed accordingly and building dimensions were input into the model for Kilns 1, 2, and 3. In a separate modeling analysis, receptors were located in those directions in which downwash will not occur for the stack for Kilns 1 and 2. The receptors were located along the radials at distances of 100, 300, 500, 800, 1100, 1500, 2000, and 2500 meters. Impacts on plant property were eliminated from consideration.

Discrete receptors were used to determine the air quality impacts at the boundary of the Everglades National Park (PSD Class I area).

Meteorological data used in the modeling consisted of five years (1982-1986) of hourly surface data taken at Miami. Mixing heights used in the modeling were based on upper air data from West Palm Beach.

Table 1 lists the significant and net emission rates for the proposed conversion. To provide a conservative estimate of ambient impact, the applicant's proposed maximum emissions were used in the dispersion model. Table 2 lists the stack parameters and emission rates for the proposed conversion of Kiln 2 and the existing emission rates for Kilns 1 and 3.

Table 1. Significant and Net Emission Rates (Tons per Year)

Pollutant	Significant Emission Rate	Existing Emissions	Applicant's Proposed Maximum Emissions	Net Emissions	Applicable Pollutant (Yes/No)
CO	100	1281.6	1379.7	98.1	No
NO2	40	396.9	667.4	270.5	Yes
SO2	40	14.1	1576.8	1562.7	Yes
PM	25	42.5	61.1	18.6	No
PM10	15	36.1	50.9	14.8	No
VOC	40	73.7	113.5	39.8	No
Lead	0.6	8.4	9.9	1.5	Yes
Be	0.0004	0.168	0.197	0.029	Yes
Sulfuric Acid Mst	7	0.4	47.3	46.9	Yes

Table 2. Stack Parameters for Proposed and Existing SO2 Sources.

Source	Emission Rate (g/s)	Height (m)	Exit Temp (K)	Exit Vel (m/s)	Diameter (m)
Proposed Kiln 2	50.4	61	422	9.1	2.44
Existing Kiln 1	5.7	61	465	12.8	2.44
Kiln 3	50.4	61	450	11.0	4.57

The NO2 emission rate for Kiln 2 is 6.4 g/s.

C. Analysis of Existing Air Quality

Preconstruction ambient air quality monitoring is required for all pollutants subject to PSD review. In general, one year of quality assured data using an EPA reference, or the equivalent monitor must be submitted. Sometimes less than one year of data, but no less than four months, may be accepted when Departmental approval is given.

An exemption to the monitoring requirement can be obtained if the maximum air quality impact, as determined by air quality modeling, is less than a pollutant-specific "de minimus" concentration. In addition, if current monitoring data exists and these data are representative of the proposed source area, then at the discretion of the Department these data may be used.

The predicted ambient impact of the net emission increase for those pollutants subject to PSD review are listed in Table 3. Sulfuric acid mist is not listed because there is no de minimus level for this pollutant. However, an estimate of sulfuric acid mist ground-level concentrations can be obtained from modeling performed on SO2. Sulfuric acid mist is emitted at a rate of three percent of SO2. Therefore, a maximum concentration of 1.8 ug/m3 is predicted for sulfuric acid mist. This value is much less than the acceptable ambient concentration of 4.76 ug/m3, as defined by the Department. Consequently, monitoring for this pollutant is not required.

The predicted maximum impact for NO2 and lead is less than their respective de minimus impact levels. Therefore, no additional monitoring was required for NO2 and lead. While the modeled impact for Be is greater than its de minimus value, it is much below the Department's guideline acceptable ambient concentration of 0.0025 ug/m3 annual average. The predicted maximum impact for SO2 is greater than the appropriate de minimus value. The applicant obtained ambient SO2 monitoring data from the Department for a monitoring station located within 3 km of

the Tarmac facility. The monitor (Site 0860-019) is located at the intersection of SR 821 and US 27. The data were obtained from the monitor for the period August 1987 through October 1988.

The highest measured 3-hour SO2 concentration was 15 ug/m3, and the highest measured 24-hour concentration was 8 ug/m3. The annual mean recorded at this site was 3 ug/m3. For the purposes of application these monitored values are considered to be the "background" concentration for SO2 in this area.

Table 3. Maximum Air Quality Impacts for Comparison to the Significant Impact and De Minimus Ambient Levels.

Pollutant	Avg. Time	Predicted Impact (ug/m3)	Sign. Impact Level (ug/m3)	De Minimus Level (ug/m3)
NO2	Annual	0.5	1.0	14.0
SO2	3-hour	182.6	25.0	N/A
	24-hour	61.0	5.0	13.0
	Annual	4.1	1.0	N/A
Pb	3-Month	0.014	N/A	0.1
Be	24-hour	0.001	N/A	0.0005

D. PSD Increment Analysis (NO2 and SO2)

1. Class I Area

A Class I area increment analysis is required because the facility is located within 100 km of the Everglades National Park, a designated Class I area. Modeling results indicate the maximum NO2 PSD Class I increment consumed is 0.02 ug/m3, which is less than one percent of the allowable PSD NO2 increment of 2.5 ug/m3, annual average.

Modeling results indicate the maximum SO2 increment consumed is 18.5 ug/m3 for a three-hour average, 4.7 ug/m3 for a 24-hour average and 0.6 ug/m3 for an annual average. These predicted impacts are below the allowable increment values of 25, 5, 2 ug/m3, respectively.

2. Class II Area

The Tarmac facility is located in a Class II area. This area is also designated as an attainment area for NO2 and SO2. Therefore, a PSD increment analysis is required to show compliance with the Class II NO2 and SO2 increments.

The PSD increment represents the amount that new sources in an area may increase ambient ground-level concentrations of a pollutant. At no time, however, can the increased loading of a pollutant cause or contribute to a violation of the ambient air quality standard.

Atmospheric dispersion modeling, as previously described, was performed to quantify the amount of PSD increment consumed. The results of this modeling indicate that the predicted NO2 impact is below the significant impact level (Table 3). The modeling results indicate the maximum NO2 Class II increment consumed is 0.5 ug/m3, which is two percent of the allowable PSD NO2 increment of 25 ug/m3, annual average.

Modeling results indicate the maximum SO2 increment consumed is 162.1 ug/m3 for a three-hour average, 55.1 ug/m3 for a 24-hour average and 5.1 ug/m3 for an annual average. These predicted impacts are below the allowable increment values of 512, 91 and 20 ug/m3, respectively.

E. AAQS Analysis

Given existing air quality in the area of the Tarmac facility, emissions from the proposed conversion are not expected to cause or contribute to a violation of an AAQS. The results of the AAQS analysis are summarized in Table 4.

Of the pollutants subject to review, only NO2, SO2 and lead have an AAQS. Dispersion modeling was performed as detailed earlier for the proposed modification. The results indicate that, except for SO2 and lead, the maximum impacts of these pollutants were less than the significant impact levels defined in Rule 17-2.100 (170), FAC. As such, no modeling of other sources was necessary for NO2. The total NO2 impact was determined from the impact of Kiln 2 added to a background concentration of 31 ug/m3 (the highest annual average in Dade County in 1988). The maximum calendar quarterly average for lead was estimated to be 0.014 ug/m3. When combined with a background concentration of 0.1 ug/m3 (the highest quarterly average in Dade County in 1988), this results in a total concentration of 0.114 ug/m3 which is well below the lead AAQS. The total SO2 impacts were determined from the impacts of the modeled sources added to the background concentration.

The total impact on ambient air is obtained by adding a "background" concentration to the maximum modeled concentration. This "background" concentration takes into account all sources of a particular pollutant that are not explicitly modeled. The "background" concentrations for SO2 are discussed in the Analysis of Existing Air Quality section.

Table 4. Ambient Air Quality Impact

Pollutant and Averaging Time	Maximum Impact of Proposed Project (ug/m3)	Predicted Total Impact (ug/m3)	Florida AAQS (ug/m3)
NO2 (Annual)	0.5	31.5	60
SO2 (3-hour)	239.4	254.4	1300
SO2 (24-hour)	65.1	73.1	260
SO2 (Annual)	10.7	13.7	60
Lead (3-Month)	0.014	0.114	1.5

The predicted SO2 impacts, as detailed in Table 4, are well below the Dade County AAQS's of 350 ug/m3 (3-hour), 110 ug/m3 (24-hour) and 25 ug/m3 (Annual).

VI. Additional Impacts Analysis

1. Impacts on Soils and Vegetation

The maximum ground-level concentration predicted to occur for SO2 as a result of the proposed project, including a background concentration, will be below the applicable AAQS including the national secondary standard developed to protect public welfare-related values. As such, this project is not expected to have a harmful impact on soils and vegetation.

2. Impact on Visibility

Impacts upon visibility in the PSD Class I area (Everglades National Park) were predicted with the EPA Level-1 visibility screening model. The predicted impacts upon visibility are below the Level-1 screening criteria for the visibility parameters. As a result, virtually no impacts upon visibility are predicted.

3. Growth-Related Air Quality Impacts

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

4. GEP Stack Height Determination

Good Engineering Practice (GEP) stack height means the greater of: (1) 65 meters or (2) the maximum nearby building height plus 1.5 times the building height or width, whichever is less. The existing stack for Kiln 2 is 61.0 m in height and, therefore, does not exceed the GEP stack height (65 m).

V. Conclusion

Based on the information provided by Tarmac Florida, Inc., the Department has reasonable assurance that the proposed kiln No. 2 coal conversion project, as described in this evaluation, and subject to the conditions proposed herein, will not cause or contribute to a violation of any air quality standard, PSD increment, or any other technical provision of Chapter 17-2 of the Florida Administrative Code.

Thomas
3/30/90

Best Available Control Technology (BACT) Determination
Tarmac Florida, Inc.
Dade County

The applicant proposes to convert an existing natural gas/No. 6 fuel oil kiln to coal firing at their portland cement manufacturing plant in northwest Dade County. The kiln (No. 2) is one of three cement kilns at the facility. Each of the kilns was permitted to convert to coal in 1984, however kiln No. 2 was never converted. In addition, it is expected that the permit limit that was established for sulfur dioxide is not adequate based on experience with burning coal in kiln No. 3.

The applicant has indicated the maximum net total annual tonnage of regulated air pollutants emitted from the fuel conversion project based on 197,100 tons per year clinker production to be as follows:

Pollutant	Max. Net Increase in Emissions (TPY)	PSD Significant Emission Rate (TPY)
TSP	18.6	25
PM_{10}	14.8	15
SO_2	1,563	40
NOx	270.5	40
CO	98.1	100
VOC	39.8	40
Pb	1.46	0.6
H_2SO_4 Mist	46.9	7
Be	0.03	0.0004

Rule 17-2.500(2)(f)(3) of the Florida Administrative Code (F.A.C.) requires a BACT review for all regulated pollutants emitted in an amount equal to or greater than the significant emission rates listed in the previous table.

BACT Determination Requested by the Applicant

Pollutant	Determination
SO_2	16.0 lb/ton of clinker
H_2SO_4 Mist	0.48 lb/ton of clinker
NOx	8.02 lb/ton of clinker

Date of Receipt of a BACT Application

September 5, 1989

Review Group Members

This determination was based upon comments received from the applicant and the Permitting and Standards Section.

BACT Determination Procedure

In accordance with Florida Administrative Code Chapter 17-2, Air Pollution, this BACT determination is based on the maximum degree of reduction of each pollutant emitted which the Department, on a case by case basis, taking into account energy, environmental and economic impacts, and other costs, determines is achievable through application of production processes and available methods, systems, and techniques. In addition, the regulations state that in making the BACT determination the Department shall give consideration to:

(a) Any Environmental Protection Agency determination of Best Available Control Technology pursuant to Section 169, and any emission limitation contained in 40 CFR Part 60 (Standards of Performance for New Stationary Sources) or 40 CFR Part 61 (National Emission Standards for Hazardous Air Pollutants).

(b) All scientific, engineering, and technical material and other information available to the Department.

(c) The emission limiting standards or BACT determinations of any other state.

(d) The social and economic impact of the application of such technology.

The EPA currently stresses that BACT should be determined using the "top-down" approach. The first step in this approach is to determine the most stringent control available for a similar or identical source or source category. If it is shown that this level of control is technically or economically infeasible for the source in question, then the next most stringent level of control is determined and similarly evaluated. This process continues until the BACT level under consideration cannot be eliminated by any substantial or unique technical, environmental, or economic objections.

BACT Analysis

A review of the BACT/LAER clearinghouse for portland cement manufacturing facilities indicates a wide range of SO_2 limitations. The BACT determinations have been established in terms of percent reduction, mass emissions per ton of feed, per ton of product (clinker), and per unit of time (hour). In some cases determinations have been expressed in terms of pounds per million Btu heat input, or parts per million.

For percent SO_2 reduction BACT determinations have ranged from a low of 20 percent to a high of 90 percent for coal fired facilities.

For mass emissions as a function of heat input, previous BACT determinations from coal fired facilities range from 0.488 to 2.41 pounds per million Btu. Although the BACT/LAER Clearinghouse has several determinations which have been expressed in terms of throughput (lbs/ton), it is not clear as to whether or not the emissions rate given is based on raw materials, feed or clinker produced. As this is the case, these determinations will not be used in evaluating the proposed emission rate of 16 pounds per ton of clinker produced.

The applicant has proposed a SO_2 emission rate of 400 lbs/hr (16 lb/ton of clinker). This emission is based on an inherent removal efficiency of 36 percent, considering that the coal for firing the kiln will have a maximum sulfur content of 2.0 percent. Taking into consideration the kiln's maximum heat input of 162.5 MMBtu/hr, the proposed emission rate can also be equated to 2.46 lb/MMBtu.

The proposed SO_2 emission rate reduction can be compared to previous BACT determinations as follows:

Previous BACT Determinations

Basis	Least Stringent	Most Stringent	Applicant's Proposal
Percent SO_2 Reduction	20	90	36
lbs/MMBtu	2.41	0.488	2.46

A review of the SO_2 emission rate/reduction summary indicates that the applicant's proposal is not representative of what BACT should be in terms of pounds emitted per million Btu heat input and is marginal for percent SO_2 reduction. In fact, the least stringent BACT determinations (20% reduction and 2.41 lb/MMBtu) were established for a source which was permitted in 1981 and is not representative of today's "top down" BACT evaluations.

The sulfur dioxide emissions from coal fired portland cement production facilities can be reduced or controlled by restricting the coal's sulfur content, add on control equipment, and inherent removal attributed to the limestone feed which is dependent upon the kiln's design.

Several of the more stringent BACT determinations have been based on the use of low sulfur coal, with the lowest level indicated being 0.8 percent. In other cases the determinations have established that control be achieved by using lime injection and/or fabric filters as BACT, or have based BACT on the inherent SO_2 removal that is provided only by the limestone component of the feed to produce clinker. Each of these alternatives will be evaluated in greater detail below.

The applicant has proposed to use coal with a sulfur content not to exceed 1.75 percent on a monthly average with the maximum sulfur content not to exceed 2.0 percent. Given these maximums, a cost/benefit analysis of switching to a lower sulfur content coal can be conducted. The applicant has indicated that the cost of switching to coal with a sulfur content of 1.5 and 1.0 percent would be an additional $3.80 and $4.90 per ton of coal, respectively. Given the sulfur dioxide reductions that would be achieved using the lower sulfur coals the costs per ton of SO_2 controlled would be $1,784 and $983 for 1.5 and 1.0 percent sulfur coal, respectively. Each of these costs is below the New Source Performance Standard (NSPS) guideline of $2,000 per ton of SO_2 controlled that is used for establishing NSPS.

Several of the portland cement manufacturing facilities listed in the BACT/LAER Clearinghouse achieve part of the overall SO_2 control by using a baghouse as the particulate control device. The applicant stated that a baghouse would inherently provide greater removal (in the range of 20 to 45 percent) than the proposed ESP due to the filter cake formed on the bags. The clearinghouse lists some facilities in which the level of control has been additionally enhanced by incorporating lime/limestone injection.

The applicant has indicated that the additional removal which might be obtained from using a baghouse does not warrant the expense. In 1983 dollars, the cost of purchasing and operating a baghouse is estimated to be 1.9 million and 0.6 million, respectively. These costs are not justified since an efficient particulate control device (ESP) is already in place.

The BACT/LAER Clearinghouse lists facilities that provide SO_2 reductions up to 90 percent based on the inherent control that is provided only by the alkaline content of the cement dust and the particulate control device. The applicant stated that the proposed inherent SO_2 removal efficiency of 36 percent is based upon experience with burning coal in kiln No. 3. Testing of kiln No. 3 has shown an average SO_2 removal efficiency of approximately 75 percent. The applicant does not expect the same efficiency, however, for kiln No. 2 since kiln No. 2 is smaller, shorter, and less energy efficient. Being shorter, the applicant states that there would be less retention time of the gases in the kiln, thereby having less time for absorption into the

clinker. In addition, the operating conditions (temperature, excess air, etc.) may be different in kiln No. 2 than kiln No. 3. As a result, the inherent SO_2 removal efficiency is expected to be less than that achieved in kiln No. 3 and is proposed to be 36 percent.

The applicant has indicated that the amount of sulfuric acid mist (H_2SO_4) emissions will be equivalent to approximately 3 percent of the SO_2 emissions. As this is the case, BACT for H_2SO_4 will be established at 3 percent of the BACT emission limit for SO_2.

Like SO_2, a review of the BACT/LAER Clearinghouse indicates a wide range of limitations for nitrogen oxides. For NOx, previous BACT determinations have been established in terms of pounds emitted per ton of feed, pounds per million Btu heat input and parts per million.

In terms of pounds per ton of feed, previous BACT determinations for NOx range from a low of 1.6 pounds to a high of 2.9 pounds. For BACTs that were expressed as pounds per million Btu heat input, the clearinghouse indicates a range of 0.32 to 0.7 lb/MMBtu.

The applicant has proposed a NOx emission rate of 169.3 lb/hr. Taking into consideration the kiln's raw material feed rate of 81,000 lb/hr and heat input of 162.5 MMBtu/hr, the proposed emission rate equates to 4.2 lb/ton of feed and 1.04 lb/MMBtu, respectively.

The proposed NOx emission rate can be compared to previous BACT determinations as follows:

Previous BACT Determinations

Basis	Least Stringent	Most Stringent	Applicant's Proposal
lbs/ton feed	2.9	1.6	4.2
lb/MMBtu	0.7	0.32	1.04

A review of the NOx emission rate summary indicates that the applicant's proposal is not representative of what BACT should be both in terms of pounds emitted per ton of feed and pounds emitted per million Btu heat input. Here again, the least stringent of these BACT determinations were established for sources which were permitted several years ago, and hence is not representative of today's "top down" BACT evaluation.

The emissions of nitrogen oxides result from the oxidation of nitrogen in the fuel (fuel NOx) as well as in incoming combustion air (thermal NOx). Based on these principles, the formation of NOx is dependent upon the type of fuel, its nitrogen content, and the combustion parameters of the kiln. Although cement kilns are

limited as to what can be done to limit NOx emissions, previous BACT determinations indicate that most, if not all, facilities are controlling NOx emissions to levels which are lower than proposed by the applicant.

Environmental Impact Analysis

A review of the maximum ambient impacts associated with the coal conversion of kiln No. 2 indicates that the increase in SO_2 emissions will contribute significantly to the present background concentrations. Based on the applicant's proposal for BACT, the impacts associated with the increase in SO_2 emissions are estimated to be 162 ug/m^3, 3-hour; 54 ug/m^3, 24-hour; and 3.6 ug/m^3, annual average. These impacts are well in excess of the present background concentrations of 15 ug/m^3, 3-hour; 8 ug/m^3, 24-hour; and 3 ug/m^3, annual average.

Based on this impact review, the Department has determined that Tarmac's proposal to convert kiln No. 2 to coal firing has the potential to contribute substantially to the SO_2 concentration in that area. As this is the case, the Department believes that a BACT determination which would reduce the proposed SO_2 impacts is justified. Although BACT has also been required for NOx emissions, the maximum annual impact associated with the conversion of kiln No. 2 is below the significant impact level of 1.0 ug/m^3. As this is the case, the increase in NOx impact due to the proposal will not be a major factor in the BACT determination.

In addition to the increased emissions of criteria pollutants, the conversion to coal has the potential to generate hazardous air pollutants which are not associated with oil firing. These pollutants (zinc, phenol, and pyridine) should be controlled to some degree by the existing control equipment, and hence should not have an effect on the BACT determination. The conversion may also result in increases of other noncriteria pollutants. Here again, these increases would be minimal and would not affect the BACT determination.

Potential Sensitive Concerns

The applicant has indicated that any level of control which would result in higher costs to the facility such as switching to a lower sulfur content coal would affect the company's ability to be competitive with other cement suppliers. For example, the additional cost of switching to a coal with a 1.5 or 1.0 percent sulfur content would increase the cost of production by 8 and 9%, respectively. This would limit Tarmac's ability to be competitive with other cement manufacturers since Tarmac is currently just marginally competitive in this industry. In addition, Tarmac as well as other domestic cement producers, competitiveness is being currently strained by the importing of cement from Mexico.

Since 1983, Mexican producers have been importing gray portland cement and cement clinker into Arizona, New Mexico, Texas, and Florida. This cement, which has been alledgely sold at less than fair value and in some cases below production costs, has led to decreased sales by domestic producers, and resulted in the closure of 2 cement plants in Florida. As this is the case, any control measures that result in higher production costs would be economically burdensome to the applicant.

BACT Determination by DER

Discussion

Based on the information provided by the applicant and the studies conducted as part of the Department's review, the levels of control proposed by the applicant are not representative of BACT.

For sulfur dioxide the level of control proposed by the applicant (36% control and 2.46 lb/MMBtu) is only equivalent at best to the least stringent BACT determinations for other portland cement manufacturing facilities. Although the Department recognizes the economic hardship that could result from switching to a lower sulfur coal, there is evidence to suggest that a lower SO_2 emission rate can be achieved without switching.

In 1984 Tarmac applied for and received a modification of their 1980 federal Prevention of Significant Deterioration (PSD) permit to convert kiln Nos. 1, 2, and 3 to coal firing. An excerpt from the BACT determination for that PSD permit provides information on the expected level of control as follows:

"The applicant submitted test data while firing residual oil containing 2.38 percent sulfur to determine kiln product absorption of SO_2. The data indicated that 91.3% of the potential SO_2 was absorbed by the aggregate processed in kiln Nos. 1 and 2 and 98.7% in kiln No. 3. A BACT determination was made based upon the applicant's data.

After one of the kilns [kiln 3] had been converted to fire coal, the exhaust gases were tested for SO_2 content. The data indicated the absorption of SO_2 in the kiln product was 75 to 80 percent, not the reduction originally anticipated. The coal fired in the kiln during the test contained two percent sulfur."

This information indicates that for kiln No. 3 the efficiency of SO_2 absorption decreased by a maximum of 24 percent when coal was fired instead of residual oil. Although the data indicate that the efficiency of absorption was higher for kiln No. 3 (98.7% for kiln No. 3 compared to 91.3% for kiln Nos. 1 and 2) when firing residual oil, it is expected that the differential efficiency

decrease for firing coal instead of residual oil should be similar for all three kilns. Based on this the expected efficiency of SO_2 absorption when firing coal would be a minimum of 69.4% instead of the proposed 36 percent for kiln 2.

A sulfur dioxide reduction of 69.4 percent is more representative of previous BACT determinations. In terms of pounds emitted per heat input, a 69.4 percent reduction equates to 1.18 lb/MMBtu which also better represents BACT. In addition, 1.18 lb/MMBtu is consistent with the New Source Performance Standard (NSPS) for fuel burning equipment of similar size. For coal fired industrial-commercial-institutional steam generating units with heat input capacities between 100 and 250 million Btu per hour the least stringent NSPS requires that SO_2 emissions not exceed 1.2 lb/MMBtu.

For nitrogen oxides the level of control proposed by the applicant also exceeds what has been previously established as BACT. Here again, the Department believes that there is evidence to suggest that cement kilns can meet a lower than proposed emission limitation.

Taking into consideration the applicant's proposed NOx emission rate of 169.3 lb/hr with the proposed clinker production rate of 25 tons per hour, the NOx emissions are equivalent to 6.77 pounds per ton of clinker produced. This level greatly exceeds the uncontrolled NOx emission factor of 2.8 lb/ton of clinker that is given in EPA AP-42 for both dry and wet process kilns.

The AP-42 emission factor, equivalent to 1.74 lb/ton of feed, is more representative of previous BACT determinations. In terms of heat input, the AP-42 emission factor equates to 0.43 lb/MMBtu. This emission level is within the range of precious BACT determinations, though it is on the stringent side.

By comparison, the least stringent NSPS for NOx from coal fired (except lignite) industrial-commercial-institutional steam generating units is 0.70 lb/MMBtu. This level, equivalent to a 2.84 lb/ton of feed for the Tarmac facility is representative of the least stringent BACT determination both in terms of emission per ton of feed and lb/MMBtu. As this is the case, this level (0.7 lb/MMBtu) does not appear to be unreasonable as BACT for the Tarmac facility.

Conclusion

Based on the information presented, the Department has determined that BACT for the Tarmac facility is equivalent to limiting the sulfur dioxide and nitrogen oxide emissions to the least stringent NSPS for coal fired industrial-commercial-institutional steam generating units. This decision is consistent with the requirements that all BACT determinations be at least as

stringent as any applicable NSPS. Although kilns are not steam generating units, emission limitations for fuel burning equipment should be consistent where possible. As this is the case, an emission limitation based on the least stringent NSPS limitation for another type of coal fired equipment is judged to be reasonable as a "top-down" BACT determination. In fact, any emission limitation which would exceed the least stringent NSPS would be judged to be unrepresentative of today's "top-down" BACT procedure.

The Department has determined that these levels are consistent with previous BACT determinations for portland cement manufacturing facilities and the information available suggests that these levels are reasonable for the Tarmac facility. The BACT emission levels are thus established as follows:

Pollutant	Emission Limit	Equivalent Limit
SO_2	1.20 lb/MMBtu	7.80 lbs/ton of clinker produced
NOx	0.70 lb/MMBtu	4.55 lbs/ton of clinker produced
H_2SO_4 Mist	0.036 lb/MMBtu	0.23 lbs/ton of clinker produced

In accordance with the Department's Final Order issued on December 7, 1990, (DOAH Case No. 90-3852, OGC File No. 90-0954), appended hereto is Attachment A reflecting the amount and percentage of SO_2 increment consumed in Class I and Class II areas in conjunction with SO_2 emission rates of 195 lbs/hr and 275 lbs/hr, respectively.

Details of the Analysis May be Obtained by Contacting:

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Recommended by:

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January 25, 1991
Date

Approved by:

Carol M. Browner, Secretary
Dept. of Environmental Regulation

February 25, 1991
Date