November 13, 1989

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Mr. C.H. Fancy, P.E.
Bureau of Air Regulation
Florida Department of Environmental Regulation
2600 Blair Stone Road
Tallahassee, FL 32399-2400

Re: Proposed Modification--Kiln 2 Coal Conversion
PSD-FL-142 - AC13-169901

Dear Mr. Fancy:

This correspondence provides responses to the Department's completeness letter dated October 4, 1989, concerning the above-referenced permit application. Each topic described in the EPA's draft comment letter dated October 3, 1989 is addressed in the attached response. In addition, the Department's comment concerning an air quality analysis for the Biscayne National Monument is addressed. Two sets of supportive computer printouts and computer disks are included.

If you have any questions concerning this submittal, please call Mr. David A. Buff, P.E., at 904-331-9000. I appreciate your cooperation in reviewing this important permit application.

Sincerely,

David A. Buff

David A. Buff, M.E., P.E.
Principal Engineer

DAB:dk

cc: Scott Quass
Al Townsend

TARMAC
KILN 2 COAL CONVERSION
RESPONSES TO FDER/EPA COMMENTS
NOVEMBER 1989

Prepared for:

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KBN Engineering and Applied Sciences, Inc.
Gainesville, Florida

November 8, 1989
89025B1

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1.0 APPLICABILITY DETERMINATION

The U.S. Environmental Protection Agency (EPA) raises several points in commenting on the determination of PSD source applicability and, in particular, on the determination of baseline emissions for Prevention of Significant Deterioration (PSD) new source review applicability. In response, a few general statements are appropriate before discussing each specific pollutant.

EPA contends in its comments that PSD baseline emissions should be based on actual historical emissions. The applicant is in agreement with this comment, except in regards to hours of operation and production rates. In the case of Tarmac, Kiln 2 is the "source" being modified. According to EPA and Florida Department of Environmental Regulation (FDER) PSD regulations, an increase in the operating hours or in the production rate of a source does not constitute a physical change in the source or change in the method of operation of a source (unless prohibited by a federally enforceable permit condition) [Rule 17-2.100(119)]. Therefore, increases in the hours of operation or in the production rate of a source do not constitute "modification" of that source, unless the permit restrictions are exceeded. Thus, a source's annual production rate and operating hours may fluctuate from year to year, depending on market conditions, without triggering PSD review. The PSD regulations are not intended to penalize a source merely because it did not operate at its full permitted capacity.

Tarmac is not requesting any increase in the permitted hours of operation [8,760 hours per year (hr/yr)] or in the permitted production rate [25 tons per hour (TPH)] for Kiln 2. Based upon the exemption in the regulations, actual hours of operation and production rates were not considered in the PSD applicability determination for Tarmac. PSD baseline and future emissions after conversion to coal were based upon the maximum permitted operating hours (8,760) and the maximum production rate for the kiln of 25 TPH.

Tarmac is not requesting offset credit for shutting down a source. When a source is shutdown, it is acknowledged that emission reduction credit would be based on the actual emissions as determined by source operating records. Tarmac is only requesting that it not be penalized for operating a source at lower than capacity, consistent with the exemption in the PSD regulations.

1.1 PARTICULATE MATTER

It is acknowledged that the PSD baseline for PM/PM10 emissions should be based on the actual emissions from Kiln 2. The burning of natural gas or fuel oil has no effect on PM emissions from the kiln; therefore, fuel usage is not relevant to this determination. Since hours of operation and production rate do not enter into this determination, as discussed previously, only the actual emissions in lb/hr representative of the baseline period are required to determine baseline emissions.

To establish the baseline PM emissions for Kiln 2, historic test data for the kiln from 1978 through 1982 (when the kiln shutdown) were reviewed. The test data are summarized in Appendix A, Table A-1. Although PSD rules generally require the most recent 2-year operating period for determining actual emissions, the Department may allow a different time period if it is considered more representative of normal source operation. For Kiln 2, the year 1980 is considered to be more representative for the following reasons.

1. More PM stack tests were conducted during this year than during any other year. These tests were conducted at different times and, therefore, are considered more representative of yearly emissions.
2. The average of all PM stack tests during 1980 was 16.0 lb/hr. There is another year (1978) in which the measured PM emissions were higher (18.4 lb/hr). There are also five stack tests out of the total of 18 tests which resulted in PM emissions higher than 16.0 lb/hr.

Based on these considerations, the baseline PM emission rate is determined to be 16.0 lb/hr. It is further noted that actual PM emissions over the course of a year are likely to be higher than reflected by the stack tests. This is because the compliance tests are run under the best operating conditions (i.e., kiln and ESP are all operating at optimum). However, there is no way to establish what the actual emission rate for the year was, other than the compliance tests.

Based upon a baseline PM emission rate of 16.0 lb/hr for Kiln 2 and 8,760 hr/yr permitted operation, baseline emissions are 70.08 TPY. Baseline PM10 emissions are then 85 percent of PM emissions (refer to page 2-3 of the permit application), or 13.60 lb/hr and 59.57 TPY.

Tarmac is willing to limit future maximum PM emissions from Kiln 2 to 19.3 lb/hr or 84.53 TPY. Future maximum PM10 emissions, based upon the 85 percent factor, will then be limited to 16.4 lb/hr and 71.85 TPY. The proposed new PM limit is much less than the allowable rate of 31.0 lb/hr for Kiln 2, which was based on the process weight table.

Increased fugitive emissions from the existing coal-handling equipment and new coal mill were addressed in the permit application (refer to pages 2-7 and 3-12, Table 3-3, and Appendix B). It is noted that the new coal mill will produce no new emissions, since the exhaust gases are injected into the kiln. In order to further reduce future PM emissions from the coal-handling operation, Tarmac will use a water truck in the coal pile area. The water truck will be used on an as-needed basis to minimize fugitive dust emissions due to vehicular traffic associated with the handling of coal for Kiln 2. The fugitive dust emission estimates presented in the permit application did not consider any fugitive dust control measures. The watering of the coal pile is estimated to result in a 75 percent control efficiency for vehicular traffic, based upon Reference 1, which shows that up to 90 percent control of unpaved roads can be achieved by watering.

The revised fugitive dust emissions for Kiln 2 coal handling are shown in the revised Tables B-1 and B-3 (see Appendix B). As shown, the revised total PM emissions are 4.30 TPY, and the revised PM10 emissions are 2.64 TPY. The resulting PSD applicability is presented below:

	PM	PM10
Baseline (TPY)		
Kiln 2	70.08	59.57
Future (TPY)		
Kiln 2	84.53	71.85
Coal Handling	4.30	2.64
Subtotal	88.83	74.49
Net Change (TPY)	18.75	14.92

As shown, the net increase in PM emissions is 18.75 TPY, and the net increase in PM10 emissions is 14.92 TPY. These increases are less than the respective PSD significant emission rates of 25 TPY and 15 TPY, respectively.

1.2 SULFUR DIOXIDE (SO_2)

The applicant has stated that PSD review applies for SO_2. Therefore, the determination of exact PSD baseline emissions is not relevant. However, for documentation purposes, the baseline can be assumed to be 100 percent gas firing, which results in the lowest SO_2 emissions. SO_2 emissions from gas firing in Kiln 2 were measured at 4.5 lb/hr. This equates to 19.7 TPY, based on 8,760 hr/yr operation.

1.3 NITROGEN OXIDES (NO_x)

It is acknowledged that baseline emissions for NO_x should be based on the fuel usage in Kiln 2. Actual fuel usage for the period 1977 through 1982 is presented in Table A-2 (see Appendix A). As shown, both gas and oil were burned in 1977 and 1978, but only gas was burned in 1979 through 1982. The year 1980 would be the most representative year, since the most fuel usage and clinker production occurred in this year. This year was also selected as the baseline year for PM emissions.

Based on clinker production of Kiln 2 in 1980 of 184,922 tons and the measured NO_x emission rate for gas firing of 4.73 lb/ton clinker, baseline emissions are calculated as 437.3 TPY. The proposed NO_x emissions from Kiln 2 for coal burning, as presented in the application, are 741.3 TPY. Therefore, the net increase in NO_x emissions due to the proposed modification is 304.0 TPY. Since this increase exceeds the PSD significant emission rate of 40 TPY, PSD review applies for NO_x emissions. The PSD analysis for NO_x emissions, including air quality impacts, BACT evaluation, and additional impacts, is contained in Appendix B. Maximum hourly emissions for gas firing is 118.3 lb/hr, and, for coal firing, maximum hourly emissions will be 169.3 lb/hr.

1.4 VOLATILE ORGANIC COMPOUNDS (VOCs)

The baseline VOC emissions were not based upon maximum, worst-case conditions as stated by EPA. The baseline VOC emissions were based upon a stack test for VOC on Kiln 3, which established actual emissions. It was assumed that No. 6 fuel oil was burned in the baseline calculation; however, the fuel oil was determined to contribute only 1.3 lb/hr out of the total VOC of 23.1 lb/hr. Therefore, any difference in actual emissions between natural gas and oil firing are insignificant and within the experimental error of the measurement technique (Method 25). As described previously, baseline emissions were based upon 8,760 hr/yr operation, as were future VOC emissions.

2.0 BACT DETERMINATION FOR SO_2

In regards to the SO_2 removal efficiency for Kiln 2, EPA has misinterpreted the data in Appendix A. Kiln 2 has never been converted to coal, nor stack tested when burning coal. All SO_2 stack tests on the kiln were conducted when burning gas or oil, and the actual SO_2 removal efficiencies of the system are specific to these fuels. The SO_2 emissions and removal efficiency for coal shown in Appendix A are from the 1980 permit application for Kiln 2 coal conversion, and as such were theoretical or expected rates.

The Kiln 3 coal conversion demonstrated that burning coal can result in a very different SO_2 removal efficiency. Tarmac went through many attempts to simultaneously meet the SO_2 and NO_x emission rates. This is exactly the reason for requesting the higher SO_2 emission rate for Kiln 2 when burning coal. Tarmac does not want another noncompliance situation caused by a lack of operating data. The differences between Kilns 2 and 3 are significant, such that the Kiln 3 operating experience is not directly applicable. It is not known for certain what the SO_2/NO_x emissions and interrelationship between these two pollutants will be for Kiln 2 until the kiln is actually converted and operated on coal. As stated in the application, Tarmac is willing to accept a lower SO_2 emission limit if source test data show that such a limit can be met on a continuous basis.

The use of lower sulfur coal in Kiln 2 has been investigated. The current coal contract for Kiln 3 specifies a sulfur content not to exceed 2.0 percent. Actual average coal sulfur content in 1988 was 1.5 percent for Kiln 3. Therefore, Tarmac's coal is already fairly low in sulfur.

Based on information from coal suppliers, the cost of 1.5 percent maximum sulfur coal could be as much as $3.80/ton higher or more than 2.0 percent sulfur coal, depending on the tariff zone from which the coal originated. Coal with 1.0 percent sulfur maximum could be as much as $4.90/ton higher or more. The coal suppliers could not guarantee the tariff zone from which the lower sulfur would come and, therefore, could not guarantee a coal price. In addition, the coal suppliers indicated only 6-month contracts would be given, due to uncertainty in future coal prices and supplies.

In addition to the cost of the coal, Tarmac would need to construct separate coal handling and storage facilities for Kiln 2, since the lower sulfur coal could not be mixed with the higher sulfur coal for Kiln 3. This would include separate rail dump facilities, separate storage pile, additional front-end loader, and additional coal conveying and storage bins. The capital cost of new coal handling and storage facilities for segregated coal is $1.7 million. Additional operating and maintenance (O&M) costs are estimated at $100,000 per year, including labor and materials. Use of shared coal handling facilities for Kilns 2 and 3 will result only in increased O&M costs of $20,000/yr.

Utilizing lower sulfur coal will potentially lower SO_2 emissions, but this will be very dependent on operation of the kiln. Assuming the kiln will be operated to minimize SO_2 emissions, it is assumed that SO_2 emissions due to sulfur in the fuel will be directly proportional to the sulfur content of the fuel. Based upon the information presented in the permit application, maximum SO_2 emissions from the kiln are as follows (includes the 36 percent inherent SO_2 removal efficiency):

	2.0 Percent Sulfur	1.5 Percent Sulfur	1.0 Percent Sulfur	
SO_2 due to fuel (lb/hr)	333	250	167	
SO_2 due to raw feed	66	66	66	(lb/hr)
TOTAL (lb/hr)	400	316	233	

A cost-effectiveness analysis of utilizing lower sulfur coal in Kiln 2 is presented in Table 2-1. The capital cost and O & M costs are shown for each coal sulfur content (2.0, 1.5, and 1.0 percent), as well as total

Table 2-1. Cost Analysis of Using Lower Sulfur Coal In Kiln 2

Cost Element	Maximum Coal Sulfur Content (Percent)		
	2.0 percent*	1.5 percent	1.0 percent
Capital Cost	$0	$1,700,000	$1,700,000
Annual O&M Costs:			
Coal+	$1,423,500	$1,639,872	$1,702,506
Other	20,000	120,000	120,000
Subtotal	$1,443,500	$1,759,872	$1,822,506
Annualized Costs			
Annualized Capital Cost**	$0	$340,000	$340,000
Annual Operating Costs	1,443,500	1,759,872	1,822,506
Total Annual Cost	$1,443,500	$2,099,872	$2,162,506
Differential Annual Cost	-	$656,372	$719,006
Cost Effectiveness			
Increase in Production Cost ($/ton clinker)	$0.00	> $3.00	> $3.28
(%)	0.0	> 8	> 9
SO2 Emissions (TPY)	1,752	1,384	1,021
SO2 Removed (TPY)	-	368	731
Cost Effectiveness ($/ton removed)	-	$1,784	$983

Note: All values based upon a 100 percent annual operating capacity factor.
- 219,000 tons clinker per year.
- 56,940 tons coal per year.
- Current production cost is $38/ton clinker.

* Assumes shared coal handling facilities with Kiln 3.
\+ Minimum coal costs are as follows:
2.0 percent S - $25.00/ton
1.5 percent S - $28.80/ton
1.0 percent S - $29.90/ton
Coal costs may be higher depending on tariff zone.
** Based upon Capital Charge Factor of 0.20.

annualized costs. The O&M costs include fuel costs. As shown, the differential annual cost between 2.0 and 1.5 percent sulfur coal is $656,000 per year, and between 2.0 and 1.0 percent coal is $719,000 per year.

The most significant cost effectiveness figure is that of projected production cost associated with Kiln 2. The projected production cost (which Tarmac desires to keep confidential) currently is just marginally competitive on the open market. For Kiln 2, reducing coal sulfur content to 1.5 percent would increase production cost by $3.00 per ton clinker or more, or more than an 8 percent increase in production cost. Using a 1.0 percent sulfur coal will increase production cost by $3.28 per ton clinker or more, or more than a 9 percent increase over using 2.0 percent sulfur coal.

The increased production costs for Tarmac associated with lower sulfur coal would be prohibitive. The cement industry is highly competitive. The additional cost of lower sulfur coal would place Tarmac in an unfair economic position compared to local competitors who are not restricted to the use of lower sulfur coal.

Tarmac has provided information to support the "antidumping petition" filed September 26, 1989 with the U.S. International Trade Commission and with the International Trade Administration of the U.S. Department of Commerce. This petition depicts the devastating impact on domestic cement producers in Florida, Texas, New Mexico, and Arizona caused by the dumping of cement by Mexican producers. Any increase in production costs above those projected costs for Kiln 2 would seriously impact Tarmac's competitive position. In essence, Tarmac would be forced to keep Kiln 2 shut down. Operating the kiln on oil or gas results in even higher production costs, which would be prohibitive. As a result, using oil or gas is not an option.

In summary, the cost of using lower sulfur coal in Kiln 2 would be economically prohibitive in terms of production cost and the price of clinker on the open market. Future long-term coal prices and availability are uncertain. Tarmac already uses low sulfur coal, which has generally averaged about 1.5 percent sulfur. Using lower sulfur coal would reduce SO_2 emissions by at most 730 tons per year (TPY). The actual reduction may be much less, because, as stated previously, Tarmac will make all efforts to operate Kiln 2 in order to reduce SO_2 emissions below the requested 400 lb/hr. Tarmac will agree to revising this emission limit downward if source test data demonstrate that a lower limit can be met.

In regards to the use of a baghouse as a means of SO_2 control, review of the EPA publication entitled Portland Cement Plants--Background Information for Proposed Revisions To Standards (EPA-450/3-85-003a), shows that there is inconclusive evidence concerning baghouse versus electrostatic precipitator (ESP) SO_2 removal efficiencies. This is because many unpredictable factors affect SO_2 emissions. It is stated that no significant reduction may occur in the fabric filter, depending upon the chemistry of the filter cake. This same document places the 1983 cost of a fabric filter at a small kiln such as Tarmac's at $1.9 million capital cost and $0.6 million annual operating cost. In addition, at Tarmac, the existing ESP would have to be removed to accommodate a new baghouse, requiring additional capital costs. Such costs are not justified since little or no SO_2 removal may result, and an efficient particulate control device is already in place.

3.0 AIR QUALITY ANALYSIS

3.1 BUILDING DOWNWASH EFFECTS

To fully investigate the potential effects of building downwash, a complete downwash analysis with the ISCST model was performed. This analysis evaluated potential downwash due to all structures at Tarmac. The Kiln 3/4 ESPs were simulated as a solid structure, even though they are open at the bottom. The downwash analysis for SO_2 is presented in Appendix C, and the downwash analysis for NO_x emissions is presented in Appendix D.

3.2 PROPERTY BOUNDARY

A description of the property boundary and the restrictions to public access are presented in the revised SO_2 modeling analysis (Appendix C).

3.3 AIR QUALITY ANALYSIS FOR BISCAYNE NATIONAL MONUMENT

FDER has requested an analysis of air quality impacts for the Biscayne National Park. It is Tarmac's position that such an analysis is not required by an applicant under PSD regulations, since this area is not classified as a PSD Class I area. Of course, FDER and the National Park Service are free to conduct their own analysis of the impacts on this area. However, there is no regulatory authority to request that Tarmac perform such an analysis.

APPENDIX A

HISTORICAL DATA FOR KILN 2

Table A-1. Historic PM Emissions, Kiln 2

Test Date	Run No.	Kiln Feed (TPH)	Fuel Type	Production Rate (TPH)	PM (lb/hr)	Gas Flow Rate acfm	Gas Flow Rate dscfm	Stack Temperature (°F)
02/15/78	1	39.8	gas	NA	16.46	111,745	51,066	367
02/16/78	2	39.8	gas	NA	23.28	118,490	54,982	370
02/16/78	3	39.8	gas	NA	15.40	112,319	53,501	352
1978 Average					18.38			
03/29/79	1	41.13	gas	NA	5.03	103,479	52,159	348
03/29/79	2	41.13	gas	NA	5.98	103,492	53,056	347
03/29/79	3	41.13	gas	NA	5.04	102,183	51,273	350
1979 Average					5.35			
04/24/80	20	37.68	gas	23.33	27.00	130,500	65,666	344
04/25/80	22	39.50	gas	24.46	10.00	128,300	62,500	337
04/26/80	24	36.95	gas	22.88	14.00	132,700	64,833	336
04/27/80	26	39.03	gas	24.17	12.00	132,700	64,666	335
04/28/80	28	40.38	gas	25.00	17.00	131,000	63,167	340
04/29/80	30	39.84	gas	24.67	16.00	133,700	64,500	347
1980 Average					16.00			
03/17/81	1	43.21	gas	NA	15.75	137,897	66,249	342
03/17/81	2	43.21	gas	NA	4.00	136,390	65,061	348
03/17/81	3	43.21	gas	NA	4.75	139,781	66,922	345
1981 Average					8.17			
03/04/82	1	44.38	gas	24.83	10.78	92,187	44,810	318
03/04/82	2	44.38	gas	24.83	26.29	101,278	48,082	322
03/04/82	3	44.38	gas	24.83	10.13	95,619	45,571	324
1982 Average					15.73			

Note: acfm = actual cubic feet per minute.
dscfm = dry standard cubic feet per minute.

Table A-2. Historic Fuel Usage Data, Kiln 2

Year	Production (tons clinker)	Fuel	Fuel Used*	MMBTU/ton Clinker
1977	125,443	gas oil	699 724	6.4
1978	157,352	gas oil	950 9	6.0
1979	169,075	gas	1,043	6.2
1980	184,922	gas	1,209	6.5
1981	150,690	gas	944	6.3
1982	57,098	gas	305	5.7

*Units of measure:
gas = 10^6 cubic feet.
oil = 10^3 gallon.

APPENDIX B

REVISIONS TO KILN 2 EMISSIONS OF PARTICULATE MATTER AND PM10

Table B-1. Tarmac Kiln 2 Annual Particulate Matter (TSP) Emissions Increase (Revised)

SOURCE	TYPE	s SILT CONTENT (%)	M MOISTURE CONTENT (%)	U WIND SPEED (MPH)	H DROP HEIGHT (FT)	Y DEVICE CAPACITY (YD**3)	E EMISSION FACTOR (LB/TON)
1) RAILCAR UNLOADING	BATCH DROP	5	7.2	8.8	20	87.0	0.00040
2) FEL-TO-PILE	BATCH DROP	5	7.2	8.8	10	7.0	0.00046
3) FEL-TO-LOADING HOPPER	BATCH DROP	5	7.2	8.8	10	7.0	0.00046
4) ACTIVE COAL PILE	WIND EROSION	5	-	-	-	-	*
5) ACTIVE COAL PILE	VEHICULAR TRAFFIC	5	-	-	-	-	*
6) BAGHOUSE G-509	BAGHOUSE	-	-	-	-	-	*
7) BAGHOUSE G-521	BAGHOUSE	-	-	-	-	-	*
8) BAGHOUSE G-527	BAGHOUSE	-	-	-	-	-	*

ANNUAL EMISSION ESTIMATES

SOURCE	UNCONTROLLED EMISSION FACTOR (LB/TON)	ANNUAL THRUPUT (TPY)	ANNUAL EMISSIONS (TPY)
1) RAILCAR UNLOADING	0.00040	56,940	0.012
2) FEL-TO-PILE	0.00046	56,940	0.013
3) FEL-TO-LOADING HOPPER	0.00046	56,940	0.013
4) ACTIVE COAL PILE (WIND)	*	*	0.480
5) ACTIVE COAL PILE (TRAFFIC)	*	56,940	2.56+
6) BAGHOUSE G-509	*	56,940	0.35
7) BAGHOUSE G-521	*	56,940	0.52
8) BAGHOUSE G-527	*	56,940	0.35

		TOTAL ANNUAL EMISSIONS =	4.30

*REFER TO TEXT FOR EMISSION FACTORS OR BASIS OF EMISSIONS
+RELECTS 75 PERCENT CONTROL DUE TO WATERING

Table B-3. Tarmac Kiln 2 PM10 Emissions Increase (Revised)

ANNUAL PM10 EMISSION ESTIMATES

SOURCE	TYPE OPERATION	ANNUAL PM(TSP) EMISSIONS (TPY)	PM10 PARTICLE SIZE MULTIPLIER	ANNUAL PM10 EMISSIONS (TPY)
1) RAILCAR UNLOADING	BATCH DROP	0.012	0.36	0.0043
2) FEL-TO-PILE	BATCH DROP	0.013	0.36	0.0047
3) FEL-TO-LOADING HOPPER	BATCH DROP	0.013	0.36	0.0047
4) ACTIVE COAL PILE	WIND EROSION	0.480	1.00	0.4800
5) ACTIVE COAL PILE	VEHICULAR TRAFFIC	2.56	0.36	0.9216
6) BAGHOUSE G-509	BAGHOUSE	0.35	1.00	0.3500
7) BAGHOUSE G-521	BAGHOUSE	0.52	1.00	0.5200
8) BAGHOUSE G-527	BAGHOUSE	0.35	1.00	0.3500
		------		------
	TOTAL ANNUAL EMISSIONS =	4.30		2.64

24-HOUR PM10 EMISSION ESTIMATES

SOURCE	TYPE OPERATION	MAXIMUM 24-HOUR PM EMISSIONS (lb/day)	PM10 PARTICLE SIZE MULTIPLIER	MAXIMUM 24-HOUR PM10 EMISSIONS (lb/day)
1) RAILCAR UNLOADING	BATCH DROP	0.00	0.36	0.00
2) FEL-TO-PILE	BATCH DROP	0.00	0.36	0.00
3) FEL-TO-LOADING HOPPER	BATCH DROP	0.15	0.36	0.05
4) ACTIVE COAL PILE	WIND EROSION	8.80	1.00	8.80
5) ACTIVE COAL PILE	VEHICULAR TRAFFIC	11.63	0.36	4.19
6) BAGHOUSE G-509	BAGHOUSE	2.04	1.00	2.04
7) BAGHOUSE G-521	BAGHOUSE	3.06	1.00	3.06
8) BAGHOUSE G-527	BAGHOUSE	2.04	1.00	2.04
		------		------
	TOTAL 24-HOUR EMISSIONS =	27.72		20.18

APPENDIX C

REVISIONS TO AIR QUALITY ANALYSIS FOR SO_2

REVISIONS TO AIR QUALITY ANALYSIS FOR SO_2

C.1 SO_2 MODELING METHODOLOGY

The following discussion is presented in response to comments received from FDER and EPA regarding the PSD permit application for the proposed conversion to coal of Kiln 2 at the Tarmac facility located in northwest Dade County. This response should be viewed in conjunction with the PSD Permit Application (Kiln 2 Coal Conversion, Tarmac Florida, Inc.) prepared by KBN and submitted to FDER in August 1989. All data and assumptions contained in the PSD application remain unchanged except as discussed in the following paragraphs.

The effects of building downwash from structures at the Tarmac facility on predicted SO_2 impacts were considered. The most significant structures at the Tarmac facility are the finish mill building, the kiln burner building, Kiln 1 and 2 ESPs, and Kiln 3 and 4 ESPs. As stated in the PSD application, the kiln burner building and Kiln 1 and 2 ESPs are not tall enough to influence plume dispersion from any of the kilns. However, potential downwash could occur due to the finish mill building and Kiln 3 and 4 ESPs, since the stacks for Kilns 1, 2, and 3 are less than Good Engineering Practice (GEP) stack height for these structures. Source-building combinations and directions relative to the location of Kiln 2, in which building downwash is possible, are presented in the following table (also refer to Figure C-1.).

Source	Radial Direction (Degrees)	Structure
Kilns 1 and 2	120-150	Kiln 3 and 4 ESP
	100-120	Finish Mill Building
	280-330	Kiln 3 and 4 ESP
	Other directions	None
Kiln 3	All directions	Kiln 3 and 4 ESP

The Kiln 3 stack is downwashed in all directions, but Kiln 1 and Kiln 2 stacks are downwashed only in certain directions. The stacks for Kilns 1

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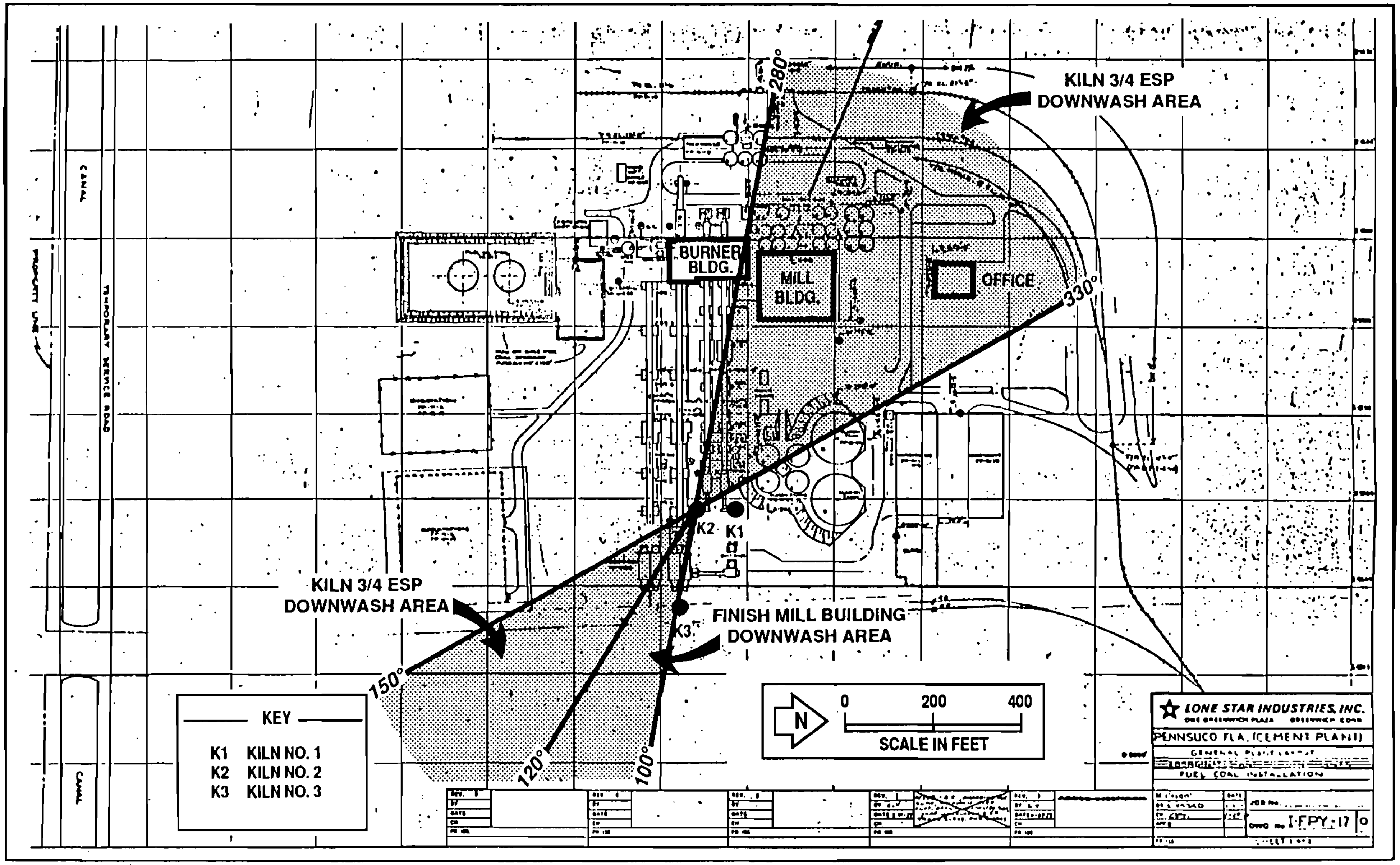

Figure C-1 BUILDING DOWNWASH ANALYSIS FOR KILN NO. 2

KBN

and 2 are more than two building heights upwind from the finish mill building and, therefore, are only influenced downwind of this building in the 100° through 120° radial directions.

The building dimensions presented in the PSD application were used in the modeling analysis. None of the structures at the Tarmac facility are tall enough, relative to the stack heights, to require direction-specific building dimensions used in the Schulman-Scire downwash algorithm. Therefore, potential downwash at the Tarmac facility is simulated using the Huber-Snyder downwash algorithms that conservatively assume that any stack within the influence of a building has the potential to downwash in all directions. When a stack is in the influence of several buildings, the building dimensions resulting in highest GEP are used to simulate downwash.

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° through 150°; 280° through 300°; and 310° through 330°) 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. Therefore, building dimensions were not input into the model for Kilns 1 and 2 for this case. Building dimensions were included for Kiln 3, which due to its proximity to Kiln 3 and 4 ESP, has the potential to downwash in all directions. The results of each case were reviewed and highest annual and highest, second-highest short-term impacts were identified.

Impacts on plant property, previously reported in the PSD application, were eliminated from consideration. Only those impacts affecting ambient air (not on the limited access Tarmac property) were reported for comparison to PSD increments and AAQS. The extent of Tarmac's plant property is shown in Figure C-2. Distance and direction to plant property relative to Kiln 2 are presented in Table C-1. (Note that in Figure 2-2 of the application,

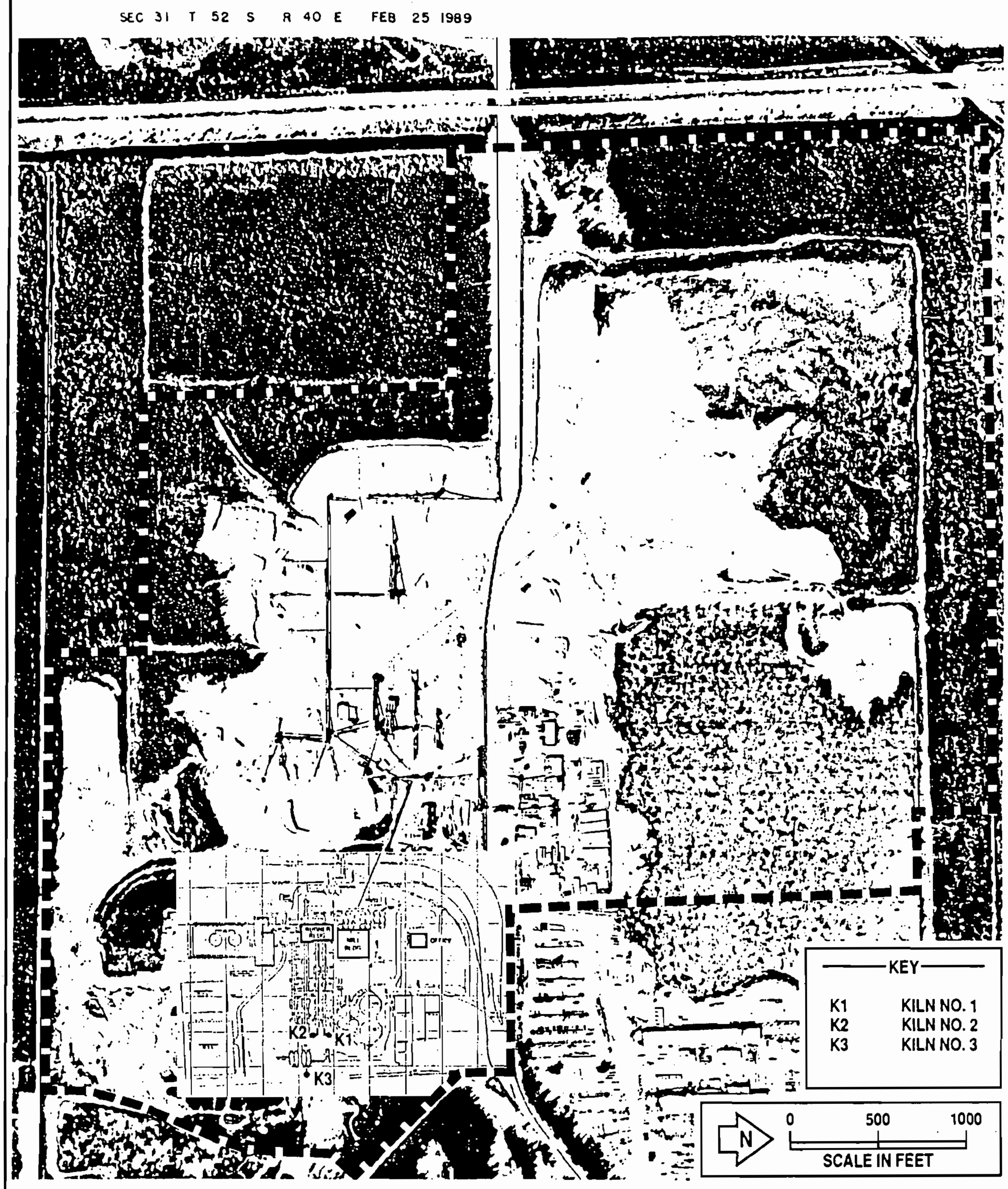

Figure C-2 PLOT PLAN AND PLANT PROPERTY BOUNDARY OF TARMAC FACILITY

KBN

Table C-1. Plant Property Receptors Used in the Modeling Analysis

Direction* (°)	Distance* (m)	Direction* (°)	Distance* (m)
10	336	190	461
20	230	200	470
30	211	210	509
40	211	220	576
50	211	230	701
60	221	240	739
70	230	250	835
80	202	260	1,094
90	192	270	1,085
100	192	280	1,114
110	211	290	1,613
120	211	300	1,766
130	278	310	1,766
140	250	320	1,488
150	221	330	374
160	326	340	346
170	461	350	336
180	451	360	326

*Relative to Kiln 2 stack location.

the north arrow was incorrectly oriented. Figures C-1 and C-2 are correct as shown.

Preliminary modeling showed that maximum impacts would be due to downwash conditions within several hundred meters of Kiln 2. Therefore, a less extensive receptor grid was used in this modeling analysis than in the original PSD application. The ring distances presented in the PSD application were retained, except that 2.5 km was the furthest downwind distance considered.

Tarmac's property boundaries are restricted by physical barriers, inaccessibility, no-trespassing signs, and guard gates. Security patrols the plant area to provide further restriction to the public. The northern, northeastern, and northwestern property boundaries are all protected by canals or lakes. In the southwest portion of the property, Tarmac's property abuts the Florida East Coast (FEC) railway property. Although no fence is located along this property, there is no access to the property by roadway, and the terrain is rugged. The FEC property in this area is bordered by canals on the west and south, further restricting public access.

Tarmac's property to the south of the kiln facilities is bordered by a canal. To the southeast, there is no access to the property by roadway. FEC property also abuts this boundary. Access roads to the southeast and northeast have guard gates. In summary, access to the Tarmac facility is difficult, with restrictions provided by water bodies, spoil piles, guards, restricted signs, and patrols.

C.2 REVISED SO_2 MODELING RESULTS

C.2.1 KILN 2 ONLY

The increase in SO_2 emissions due to Kiln 2 coal conversion, from Table 2-1 of the PSD application, is 354.7 lb/hr. The maximum impacts due to this increase are as follows: 162 $\mu g/m^3$, 3-hour; 54 $\mu g/m^3$, 24-hour; and

3.6 $\mu g/m^3$, annual average. These concentrations were obtained by rationing the maximum predicted impacts due to the proposed SO_2 emission rate for Kiln 2 (400 lb/hr), presented in Table C-2. The impacts due to the increase are above significance levels established by EPA and FDER; therefore, further modeling analysis is required for SO_2 to demonstrate compliance with PSD increments and AAQS.

C.2.2 PSD CLASS II INCREMENT ANALYSIS

Maximum SO_2 concentrations predicted from the screening analysis for comparison to the PSD Class II increments are presented in Table C-3. The results reflect impacts due to all increment consuming sources, which include Kiln 2 and Kiln 3 at Tarmac. The maximum PSD increment consumption values are well below the allowable increments. Based on the receptor spacing utilized in the modeling analysis, no refinements of the PSD Class II increment consumption values were necessary.

A summary of the maximum SO_2 PSD Class II increment consumption concentrations predicted in the analysis are presented in Table C-4. The maximum 3-hour average SO_2 PSD Class II increment consumption due to all increment consuming sources is predicted to be 162 $\mu g/m^3$, which is 32 percent of the maximum allowable PSD Class II increment of 512 $\mu g/m^3$, not to be exceeded more than once per year.

The maximum 24-hour average SO_2 PSD Class II increment consumption due to all sources is predicted to be 55 $\mu g/m^3$, which is 60 percent of the maximum allowable PSD Class II increment of 91 $\mu g/m^3$, not to be exceeded more than once per year. This maximum impact occurs at a receptor very close to the facility (300 m), and is a result of downwash conditions.

The maximum annual average SO_2 PSD Class II increment consumption is predicted to be 5.1 $\mu g/m^3$, which is 26 percent of the maximum allowable PSD Class II increment of 20 $\mu g/m^3$.

Table C-2. Maximum Predicted SO_2 Concentrations from the Screening Analysis Due to Kiln 2 Only at 400 lb/hr

Averaging Period	Maximum Concentration ($\mu g/m^3$)	Receptor Location* Direction (°)	Receptor Location* Distance (km)	Period Julian Day	Period Hour Ending	Period Year
3-Hour+	129	150	0.300	53	15	1982
	183	130	0.300	61	3	1983
	144	150	0.300	310	3	1984
	155	150	0.300	342	24	1985
	155	150	0.300	108	3	1986
24-Hour+	33	150	0.300	351	--	1982
	61	130	0.300	61	--	1983
	41	150	0.300	5	--	1984
	44	150	0.300	77	--	1985
	41	150	0.300	28	--	1986
Annual	4.1	320	1.488	--	--	1982
	2.9	310	1.766	--	--	1983
	2.9	310	1.766	--	--	1984
	3.9	150	0.300	--	--	1985
	3.5	150	0.300	--	--	1986

*Relative to the location of the Kiln 2.
+Highest, second-highest concentrations predicted for this averaging period.

Table C-3. Maximum Predicted SO_2 Concentrations from the Screening Analysis for Comparison to PSD Class II Increments

Averaging Period	Maximum Concentration ($\mu g/m^3$)	Receptor Location* Direction (°)	Receptor Location* Distance (km)	Period Julian Day	Period Hour Ending	Period Year
3-Hour+	123	150	0.300	53	15	1982
	162	130	0.300	61	3	1983
	128	150	0.300	310	3	1984
	137	150	0.300	342	24	1985
	137	150	0.300	108	3	1986
24-Hour+	40	150	0.300	11	--	1982
	55	130	0.300	61	--	1983
	38	130	0.300	328	--	1984
	43	330	0.374	325	--	1985
	44	150	0.374	80	--	1986
Annual	5.1	320	1.488	--	--	1982
	4.5	0.300	1.766	--	--	1983
	4.0	310	1.766	--	--	1984
	4.8	0.150	0.300	--	--	1985
	4.2	0.150	0.300	--	--	1986

*Relative to the location of the Kiln 2.
+Highest, second-highest concentrations predicted for this averaging period.

Note: Concentrations remain unchanged if the impacts of the proposed combined cycle units and Units 4 and 5 at FPL Fort Lauderdale are not considered in the modeling analysis.

Table C-4. Maximum Predicted SO_2 Concentrations for Comparison to PSD Class II Increments

Averaging Period	Maximum Concentration ($\mu g/m^3$)	Receptor Location* Direction (°)	Receptor Location* Distance (km)	Period Julian Day	Period Hour Ending	Period Year	PSD Class II Increment
SO_2 Concentrations							
3-Hour+	162	130	0.300	61	12	1983	512
24-Hour+	55	130	0.300	61	--	1983	91
Annual	5.1	320	1.488	--	--	1982	20

*Relative to the location of Kiln 2.

+Highest, second-highest concentrations predicted for this averaging period.

Based upon these results, operation of Kiln 2 on coal, in conjunction with all other PSD increment consuming sources, will consume less than 60 percent of the allowable Class II increments. Thus, there is PSD increment available for significant future growth in the area. As discussed in Section 6.0 of the application, the PSD Class II analysis was conducted both with and without the planned FPL Lauderdale Repowering Project. Maximum increment consumption values near Tarmac did not change as a result of the planned FPL facility. This indicates that other nearby sources (i.e., Tarmac and Dade County Resource Recovery) are the primary contributors to the Class II increment consumption values.

C.2.3 AAQS ANALYSIS

The maximum 3-hour, 24-hour, and annual average total SO_2 concentrations predicted from the screening analysis are presented in Table C-5. The total concentrations were determined from the impacts of the modeled sources added to the background concentration. These results show that the maximum SO_2 concentrations due to all sources are well below the AAQS for all averaging periods. Based upon the low predicted values, no refinements of these concentrations were performed.

The maximum 3-hour average SO_2 concentration due to all sources is predicted to be 254 $\mu g/m^3$, which is 20 percent of the Florida AAQS of 1300 $\mu g/m^3$, not to be exceeded more than once per year. The maximum 24-hour average SO_2 concentration due to all sources is predicted to be 71 $\mu g/m^3$, which is 27 percent of the Florida AAQS of 260 $\mu g/m^3$, not to be exceeded more than once per year. The maximum annual average SO_2 concentration due to all sources is predicted to be 14 $\mu g/m^3$, which is 23 percent of the Florida AAQS of 60 $\mu g/m^3$.

The Dade County Department of Environmental Resources Management, Environmental Planning Division has developed the following AAQS for SO_2 that must not be exceeded in any part of Dade County:

Table C-5. Maximum Predicted Total SO_2 Concentrations from the Screening Analysis for Comparison to AAQS

Averaging Period	Concentration ($\mu g/m^3$) Total	Total Due To Modeled Sources	Total Due To Background	Receptor Location* Direction (°)	Receptor Location* Distance (km)	Period Julian Day	Period Hour Ending	Period Year
3-hour⁺	243	228	15	20	2.500	28	24	1982
	220	205	15	10	2.500	277	21	1983
	199	184	15	220	2.500	284	3	1984
	219	204	15	360	2.500	156	24	1985
	254	239	15	350	2.500	130	24	1986
24-hour⁺	64	56	8	240	2.000	325	--	1982
	71	63	8	130	0.300	61	--	1983
	64	56	8	240	2.500	284	--	1984
	66	58	8	350	2.500	337	--	1985
	61	53	8	150	0.300	14	--	1986
Annual	14	10.5	3	320	1.488	--	--	1982
	12	8.9	3	300	1.766	--	--	1983
	12	8.8	3	310	1.766	--	--	1984
	13	10.1	3	150	0.300	--	--	1985
	12	9.4	3	150	0.300	--	--	1986

*Relative to the location of Kiln 2.
⁺Highest, second-highest concentrations predicted for this averaging period.

Note: AAQS are 1,300 ug/m³, 3-hour
260 ug/m³, 24-hour
60 ug/m³, annual

3-Hour Average--350 $\mu g/m^3$
24-Hour Average--110 $\mu g/m^3$
Annual Average--25 $\mu g/m^3$

The 3- and 24-hour average AAQS may be exceeded once per year. As shown in Table C-5, none of the predicted concentrations exceed the Dade County AAQS.

C.2.4 CLASS I AREA ANALYSIS

The results of the PSD Class I area modeling analysis for the Everglades National Park are presented in Table C-6. The modeling analysis evaluated a number of receptors along the boundary of the Class I area.

As shown in Table C-6, total Class I PSD increment consumption concentrations for SO_2 are below the Class I increments for all averaging times. The maximum 3-hour increment consumption is predicted to be 18 $\mu g/m^3$, compared to the Class I increment of 25 $\mu g/m^3$. The maximum predicted 24-hour increment consumption for SO_2 is 4.5 $\mu g/m^3$, which is below the allowable increment of 5 $\mu g/m^3$. These maximum increment consumption values are due to the effects of two increment consuming sources located in Dade County: Tarmac Florida (cement plant) and Dade County Resource Recovery (MSW incinerator). The proposed Lauderdale Repowering Project does not contribute to these maximum increment consumption values. This value was further refined using a refined receptor grid with 100 m spacing along the boundary of the Class I area. The resulting 24-hour increment consumption was 4.7 $\mu g/m^3$ (1983, Day 178).

The maximum predicted annual SO_2 increment consumption concentration in the Class I area is predicted to be 0.56 $\mu g/m^3$. This value is well below the allowable Class I increment of 2 $\mu g/m^3$ for SO_2.

To demonstrate the effects the proposed Kiln 2 Coal Conversion will have on the Class I area, the modeling analysis evaluated the impacts of Kiln 2

Table C-6. Maximum Predicted SO_2 Concentrations for Comparison to PSD Class I Increments

Averaging Period	Maximum Concentration (ug/m^3)	Period: Julian Day	Period: Hour Ending	Period: Year	PSD Class I Increment
3-Hour*	15	317	12	1982	25
	16	266	9	1983	
	16	69	24	1984	
	18	150	9	1985	
	12	251	24	1986	
24-Hour*	3.9	291	--	1982	5
	4.5	303	--	1983	
	3.8	268	--	1984	
	3.7	256	--	1985	
	4.1	349	--	1986	
Annual	0.56	--	--	1982	2
	0.53	--	--	1983	
	0.52	--	--	1984	
	0.49	--	--	1985	
	0.54	--	--	1986	

*Highest, second-highest concentrations predicted for this averaging period.

only. The results of this analysis are presented in Table C-7. As shown, the maximum Class I impacts due to Kiln 2 only are 7.6 $\mu g/m^3$, 3-hour, 1.8 $\mu g/m^3$, 24-hour, and 0.17 $\mu g/m^3$, annual average. These values are less than 40 percent of the Class I increments.

Maximum total SO_2 concentrations predicted in the Class I area due to all sources are presented in Table C-8. These concentrations include the estimated background concentration for the Tarmac area. As shown, the maximum concentrations are predicted to be: 197 $\mu g/m^3$, 3-hour average; 53 $\mu g/m^3$, 24-hour average; and 10.0 $\mu g/m^3$, annual average. These maximum impacts are 20 percent of the AAQS or less.

C.3 ADDITIONAL IMPACT ANALYSIS

The revised SO_2 modeling analysis demonstrates insignificant changes in total SO_2 air quality impacts in the Tarmac area and in the Class I area, compared with the original modeling results. Therefore, the additional impact analysis for SO_2 contained in the application is still applicable.

Table C-7. Maximum Predicted SO_2 Concentrations for Comparison to PSD Class I Increments Due to Kiln 2 Only at 400 lb/hr

Averaging Period	Maximum Concentration (ug/m^3)	Period: Julian Day	Period: Hour Ending	Period: Year	PSD Class I Increment
3-Hour*	7.1	281	21	1982	25
	7.6	138	6	1983	
	6.8	260	24	1984	
	6.7	297	3	1985	
	6.2	221	3	1986	
24-Hour*	1.4	292	--	1982	5
	1.8	290	--	1883	
	1.4	227	--	1984	
	1.2	229	--	1985	
	1.3	303	--	1986	
Annual	0.17	--	--	1982	2
	0.14	--	--	1983	
	0.15	--	--	1984	
	0.13	--	--	1985	
	0.15	--	--	1986	

*Highest, second-highest concentrations predicted for this averaging period.

Table C-8. Maximum Total Predicted SO_2 Concentrations for the Everglades NP Class I Area

Averaging Period	Concentration ($\mu g/m^3$)			Year	AAQS
		Total due to			
	Total	Modeled Sources	Background		
3-Hour*	163	148	15	1982	1,300
	197	182	15	1983	
	185	170	15	1984	
	171	156	15	1985	
	169	154	15	1986	
24-Hour*	49	41	8	1982	260
	51	43	8	1983	
	51	43	8	1984	
	53	45	8	1985	
	44	36	8	1986	
Annual	10.0	7.0	3	1982	60
	9.3	6.3	3	1983	
	10.0	7.0	3	1984	
	9.1	6.1	3	1985	
	9.1	6.1	3	1986	

*Highest, second-highest concentrations predicted for this averaging period.

APPENDIX D

PSD ANALYSIS FOR NO_x

PSD ANALYSIS FOR NO_x

D.1 NO_x AIR QUALITY IMPACT ANALYSIS

The results of the SO_2 analysis for the burning of coal in Kiln 2 were scaled to determine maximum annual NO_x impacts. Maximum annual SO_2 impacts due to Kiln 2 only at 400 lb/hr were 4.1 $\mu g/m^3$. The increase in NO_x emissions for Kiln 2, due to conversion from gas to coal, is 51 lb/hr (169.3 lb/hr minus 118.3 lb/hr). The calculated maximum annual NO_x impact due to this increase is therefore 0.52 $\mu g/m^3$. By the same methodology, the maximum annual NO_x impact in the Class I area due to Kiln 2 coal conversion is 0.02 $\mu g/m^3$. The significant impact level established by FDER and EPA is 1.0 $\mu g/m^3$; therefore, no further modeling analysis for NO_x is required.

The maximum predicted NO_x impact due to the increase is also below the NO_x de minimis monitoring concentration of 14 $\mu g/m^3$, annual average. Therefore, Tarmac may be exempted from the preconstruction PSD monitoring requirements for NO_x.

D.2 BACT ANALYSIS FOR NO_x

The State of California, South Coast Air Quality Management District (SCAQMD) was contacted (Mr. Bill Dennison) to inquire as to NO_x control technologies for cement kilns. Mr. Dennison stated that to his knowledge there were no cement kilns operating or permitted in California with add-on NO_x control (i.e., selective catalytic or nonselective catalytic reduction). Review of the BACT/LAER Clearinghouse publications also did not reveal any determinations that required add-on NO_x control. All newly permitted cement kilns were "dry" process kilns, which employed precalciners or calciners ahead of the kiln. NO_x controls utilized were low furnace temperatures and low excess air.

EPA conducted a review of the NSPS for Portland plants in 1985 (Portland Cement Plants--Background Information for Proposed Revisions to Standards). This review revealed only one study that addressed NO_x reduction technologies for Portland cement plants firing coal (KVB, 1982). This report presented the results of a testing program on a subscale cement kiln. Only natural gas was fired in the kiln. It was concluded from the test data that the kiln was not representative of a full-scale production kiln. Therefore, the study is inconclusive. Nevertheless, the following general observations were noted.

1. Fly ash injection (dust insufflation) was the most effective means of reducing NO_x emissions.
2. Lowered excess air was not practical to control NO_x, since the cement industry already maintains the lowest practical oxygen levels in most kilns (1.5 to 2.0 percent O_2).

In another study by KVB, Inc. (1983), a wet process, coal-fired cement kiln was tested for NO_x emissions. This testing showed a 38 percent reduction in NO_x when the oxygen level was lowered from 2.9 percent to 1.5 percent. However, a simultaneous increase of 47 percent in SO_2 emission occurred. Excess air was the only process variable investigated in the full-scale testing. Further testing on a subscale cement kiln was performed, but only generalized conclusions regarding NO_x control measures could be made.

In a third study (KVB, 1984), a subscale cement kiln was evaluated for NO_x emissions. Several control techniques were analyzed, including flue gas recirculation, combustion air preheat, primary air velocity, primary/secondary air ratio, and oxygen level. Because data obtained from the study were limited, only the following general conclusions could be drawn.

1. NO_x emissions are very sensitive to excess O_2 levels.
2. Flue gas recirculation is more effective with gas firing than with coal firing.
3. Primary air dilution with inert gas was the most effective combustion modification for NO_x reduction firing coal.

Unfortunately, SO_2 emissions were not measured and hence, no assessment of NO_x/SO_2 relationships was performed.

In summary, there are few data available on NO_x combustion modification techniques for full-scale wet process cement kilns. In the one study which employed a full-scale kiln, only the oxygen level in the kiln was evaluated, and the data show a significant increase in SO_2 emissions when oxygen is lowered to reduce NO_x emissions. Significantly more research and application to a full-scale cement kiln is needed before combustion modification techniques can be applied successfully to cement kilns. Tarmac will minimize the oxygen level in Kiln 3 to the extent possible, while monitoring clinker quality and minimizing SO_2 emissions.

The most useful information concerning potential NO_x emission reductions through process controls is the experience Tarmac has gained from operation of Kiln 3 on coal. Although Kiln 2 may operate somewhat differently because of its smaller size and different operating parameters, the following general statements are believed to be applicable.

1. NO_x emissions are inversely related to SO_2 emissions (i.e., as NO_x is reduced, SO_x increases).
2. NO_x emissions are reduced by lowering flame temperature and oxygen level (low excess air) in the kiln.

In a wet process kiln, such as Kiln 2, temperature is critical and high enough temperatures must be a maintained to calcine the raw feed. If temperature is not maintained, product quality is reduced.

As a result, NO_x emissions from Kiln 2 can be reduced only by adjusting process parameters, but not so much as to affect clinker quality. Also, SO_2 emissions will increase when reducing NO_x emissions. Tarmac's objective for Kiln 2 will be to minimize SO_2 emissions while simultaneously achieving the proposed NO_x emission limit of 6.77 lb/ton clinker.

REFERENCES

KVB, Inc. 1984. Combustion Modification Tests on a Subscale Cement Kiln for NO_x Reduction. EPA-600/7-84-075.

KVB, Inc. 1983. Evaluation of Combustion Variable Effects on NO_x Emissions From Mineral Kilns. EPA-600/7-83-045.

KVB, Inc. 1982. Application of Advanced Combustion Modifications to Industrial Process Equipment: Subscale Test Results. EPA-600/7-82-021.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IV
345 COURTLAND STREET. N.E.
ATLANTA. GEORGIA 30365

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OCT 18 1989

Ms. Patricia G. Adams, Planner
Bureau of Air Regulation
Florida Department of Environmental
  Regulation
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee Florida 32399-2400

RE: Tarmac Florida, Inc. (PSD-FL-142)

Dear Ms. Adams:

We have received your September 15, 1989, letter transmitting the Prevention of Significant Deterioration (PSD) application submitted by Tarmac Florida, Inc., for the conversion of kiln No. 2 to coal at the facility's existing Portland cement plant. As discussed on October 3, 1989, between Mr. John Reynolds of the Florida Department of Environmental Regulation (DER) and Mark Armentrout of my staff, we are offering the following comments.

Applicability Determination

The source has incorrectly performed PSD applicability determinations for particulate matter (PM/PM_{10}), oxides of nitrogen (NO_x), sulfur dioxide (SO_2) and volatile organic compounds (VOC). The underlying flaw in all of these determinations is in the calculation of baseline (historic actual) emissions. In the case of PM emissions, the source concluded that baseline emissions are 31.3 lb/hr. They justify this value by stating that the highest actual source test emissions, as determined by a March 1982 test, resulted in a PM emission rate of 26.3 lb/hr which is close to the current allowable of 31.3 lb/hr. As you are aware, baseline emissions must be calculated based on the two-year average of actual emissions under representative operating conditions. We request that the facility amend their application by including the results of all PM source tests during the representative two-year period, recalculating baseline emissions, and performing a PSD review, if applicable. Furthermore, and as discussed below, the applicant must submit production records for the baseline period which indicate the usage of oil and gas in the kiln and annual hours of operation. It also appears that the applicant has not included the fugitive emissions increases (new coal mill) and increases from the No. 3 kiln coal handling equipment in the PM applicability determination, i.e., in the new allowable PM emission rates.

UNITED STATES
ENVIRONMENTAL PROTECTION AGENCY
REGION IV
345 COURTLAND STREET
ATLANTA, GEORGIA 30365

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1989

Ms. Patricia G. Adams, Planner
~~Bureau of Air Regulation~~
Florida Dept. of Envirn. Regulation
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, FL 32399-2400

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OCT 23 1989
DER - BAQM

Regarding the baseline emissions calculation for SO_2 and NO_x, the applicant again used data unrepresentative of average actual emissions. The source should be required to supply actual fuel usage data and annual hours of operation in order to properly establish baseline emissions.

The baseline emission calculations for VOC also were based on maximum, worst case conditions rather than a two-year average of actual emissions. After actual fuel usage data and plant operation data is supplied for the two-year baseline period, the baseline VOC emissions should be recalculated. If the potential VOC increase resulting from the proposed coal conversion is above 40 tpy, the nonattainment new source review regulations will apply.

BACT Determination for SO_2

The applicant has requested that best available control technology (BACT) for SO_2 be their existing electrostatic precipitator/kiln system coupled with a 400 lb/hr emission limit. This represents a 36 percent SO_2 removal efficiency based upon the potential SO_2 emissions of 623.7 lb/hr. In Appendix A, actual stack test results for the No. 2 kiln indicate that the SO_2 removal inherent in the process is 91.3 percent. Actual SO_2 emissions while burning coal are calculated to be 56.7 lb/hr or about 2.27 lb SO_2 per ton of clinker (based on rated capacity). Note also that actual testing on No. 3 kiln indicates a 98.7% SO_2 removal efficiency. The current allowable emission rate for SO_2 from the No. 3 kiln is 4.6 lb SO_2 per ton of clinker. This limit is being achieved. Since actual SO_2 removal efficiency has already been established for the No. 2 kiln, the BACT determination should be based on this degree of reduction. Further, the feasibility of utilizing lower sulfur coals should be analyzed.

Air Quality Analysis

1. On page 6-14, Building Downwash Effects, the kiln should be modeled to include effects of downwash. Alternatively, the applicant could present a detailed drawing of the ESP with supporting documentation showing why the source is not subject to a building wake effects analysis.

2. A description of the property line is needed showing the area that is fenced (precluding public access). Note: The property would not be exempt unless public access is restricted.

3. A copy of the modeling input data and output tables should be submitted.

We appreciate the opportunity to comment on this permit application. It would also be appropriate to submit this application to the Federal Land Manager since the proposed facility is only 30 km from the Everglades National Park. If you have any questions, please contact Mark Armentrout of my staff at (404) 347-2864.

Sincerely yours,

Bruce P. Miller

Bruce P. Miller, Chief
Air Programs Branch
Air, Pesticides, and Toxics
Management Division

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

John Bunyak
Air Quality - Permit Review
National Park Service
P.O. Box 25287
Denver, Colorado 80225

copied: J. Reynolds
B. Andrews
M. Linn
I. Goldman
P. Hong
CHF/BT

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

October 4, 1989

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

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

Dear Mr. Quaas:

Re: Proposed Modification - Kiln No. 2 Coal Conversion
PSD-FL-142 - AC 13-169901

This is to provide notice that additional information is required for preliminary review of the above application. EPA Region IV requests a reassessment of baseline emissions, fugitive emissions, redetermination of BACT for SO_2, and revision of the air quality analysis to include downwash effects. Rather than duplicating EPA's concerns in this letter, we have enclosed a faxed copy of their draft letter to DER dated October 3, 1989. In addition to the EPA's questions, the DER meteorological staff will require an air quality impact analysis for Biscayne National Park (treated as if a Class I area) including a Level I visibility analysis.

If you have any questions, please call John Reynolds at (904)488-1344 or write to me at the above address.

Sincerely,

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

CHF/JR/t

cc: M. Armentrout, EPA
I. Goldman, SE District
P. Wong, DCDERM
D. Buff, P.E., KBN
C. Shaver, NPS

enclosure

● **SENDER:** Complete items 1 and 2 when additional services are desired, and complete items 3 and 4.

Put your address in the "RETURN TO" Space on the reverse side. Failure to do this will prevent this card from being returned to you. The return receipt fee will provide you the name of the person delivered to and the date of delivery. For additional fees the following services are available. Consult postmaster for fees and check box(es) for additional service(s) requested.

1. ☐ Show to whom delivered, date, and addressee's address. *(Extra charge)*
2. ☐ Restricted Delivery *(Extra charge)*

3. Article Addressed to:

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

HIALEAH, FL

4. Article Number

P 938 762 702

Type of Service:
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X

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PS Form **3811**, Mar. 1988 ★ U.S.G.P.O. 1988-212-865 **DOMESTIC RETURN RECEIPT**

P 938 762 702

RECEIPT FOR CERTIFIED MAIL

NO INSURANCE COVERAGE PROVIDED
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(See Reverse)

Sent to Mr. Scott Quaas, Tarmac Florida	
Street and No. P.O. Box 2998	
P.O., State and ZIP Code Hialeah, FL 33012	
Postage	$
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt showing to whom and Date Delivered	
Return Receipt showing to whom, Date, and Address of Delivery	
TOTAL Postage and Fees	$
Postmark or Date Mailed: 10-4-89 Permit: AC 13-169901 PSD-FL-142	

PS Form 3800, June 1985

DRAFT

OCT 3 1989

4APT-APB-cdw

Ms. Patricia G. Adams, Planner
Bureau of Air Regulation
Florida Department of Environmental
Regulation
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee Florida 32399-2400

RE: Tarmac Florida, Inc. (PSD-FL-142)

Dear Ms. Adams:

We have received your September 15, 1989, letter transmitting the Prevention of Significant Deterioration (PSD) application submitted by Tarmac Florida, Inc., for the conversion of kiln No. 2 to coal at the facility's existing Portland cement plant. As discussed on October 3, 1989, between Mr. John Reynolds of the Florida Department of Environmental Regulation (DER) and Mark Armontrout of my staff, we are offering the following comments.

Applicability Determination

The source has incorrectly performed PSD applicability determinations for particulate matter (PM/PM_{10}), oxides of nitrogen (NO_x), sulfur dioxide (SO_2) and volatile organic compounds (VOC). The underlying flaw in all of these determinations is in the calculation of baseline (historic actual) emissions. In the case of PM emissions, the source concluded that baseline emissions are 31.3 lb/hr. They justify this value by stating that the highest actual source test emissions, as determined by a March 1982 test, resulted in a PM emission rate of 26.3 lb/hr which is close to the current allowable of 31.3 lb/hr. As you are aware, baseline emissions must be calculated based on the two-year average of actual emissions under representative operating conditions. We request that the facility amend their application by including the results of all PM source tests during the representative two-year period, recalculating baseline emissions, and performing a PSD review, if applicable. Furthermore, and as discussed below, the applicant must submit production records for the baseline period which indicate the usage of oil and gas in the kiln and annual hours of operation. It also appears that the applicant has not included the fugitive emissions increases (new coal mill) and increases from the No. 3 kiln coal handling equipment in the PM applicability determination, i.e., in the new allowable PM emission rates.

Regarding the baseline emissions calculation for SO_2 and NO_x, the applicant again used data unrepresentative of average actual emissions. The source should be required to supply actual fuel usage data and annual hours of operation in order to properly establish baseline emissions.

The baseline emission calculations for VOC also were based on maximum, worst case conditions rather than a two-year average of actual emissions. After actual fuel usage data and plant operation data is supplied for the two-year baseline period, the baseline VOC emissions should be recalculated. If the potential VOC increase resulting from the proposed coal conversion is above 40 tpy, the nonattainment new source review regulations will apply.

BACT Determination for SO_2

The applicant has requested that best available control technology (BACT) for SO_2 be their existing electrostatic precipitator/kiln system coupled with a 400 lb/hr emission limit. This represents a 36 percent SO_2 removal efficiency based upon the potential SO_2 emissions of 623.7 lb/hr. In Appendix A, actual stack test results for the No. 2 kiln indicate that the SO_2 removal inherent in the process is 91.3 percent. Actual SO_2 emissions while burning coal are calculated to be 56.7 lb/hr or about 2.27 lb SO_2 per ton of clinker (based on rated capacity). Note also that actual testing on No. 3 kiln indicates a 98.7% SO_2 removal efficiency. The current allowable emission rate for SO_2 from the No. 3 kiln is 4.6 lb SO_2 per ton of clinker. This limit is being achieved. Since actual SO_2 removal efficiency has already been established for the No. 2 kiln, the BACT determination should be based on this degree of reduction. Further, the feasibility of utilizing lower sulfur coals should be analyzed. The applicant has also dismissed the use of a baghouse, which achieves greater SO_2 removal, based upon a conclusory statement that it is economically prohibitive. This economic showing must be included in the BACT determination.

Air Quality Analysis

1. On page 6-14, Building Downwash Effects, the kiln should be modeled to include effects of downwash. Alternatively, the applicant could present a detailed drawing of the ESP with supporting documentation showing why the source is not subject to a building wake effects analysis.

2. A description of the property line is needed showing the area that is fenced (precluding public access). Note: The property would not be exempt unless public access is restricted.

3. A copy of the modeling input data and output tables should be submitted.

We appreciate the opportunity to comment on this permit application. It would also be appropriate to submit this application to the Federal Land Manager since the proposed facility is only 30 km from the Everglades National Park. If you have any questions, please contact Mark Armentrout of my staff at (404) 347-2864.

Sincerely yours,

Bruce P. Miller, Chief
Air Programs Branch
Air, Pesticides, and Toxics
Management Division

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

John Bunyak
Air Quality - Permit Review
National Park Service
P.O. Box 25287
Denver, Colorado 80225

MARMENTROUT/CDW/10/3/89 DOC: 21-PA-BM

ARMENTROUT__________ ARONSON__________ MILLER__________

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

September 15, 1989

Mr. Wayne Aronson, Chief
Program Support Section
U.S. EPA, Region IV
345 Courtland Street, N.E.
Atlanta, Georgia 30365

Dear Mr. Aronson:

RE: Tarmac Florida, Inc.
Kiln 2 Coal Conversion
State Permit Number AC 13-169901
Federal Permit Number PSD-FL-142

Enclosed for your review and comment is the permit application for the above referenced project. If you have any comments or questions, please contact John Reynolds (review engineer), Barry Andrews (BACT), or Tom Rogers (modeling) at the above address or at (904)488-1344.

Sincerely,

Patricia G. Adams

Patricia G. Adams
Planner
Bureau of Air Regulation

/pa

Enclosure

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

September 14, 1989

Mrs. Chris Shaver, Chief
Policy, Planning and Permit Review Branch
Dept. of Interior, National Park Service
Post Office Box 25287
Denver, Colorado 80225

Dear Mrs. Shaver:

RE: Tarmac Florida, Inc.
Kiln 2 Coal Conversion
State Permit Number AC 13-169901
Federal Permit Number PSD-FL-142

Enclosed for your review and comment is the permit application for the above referenced project. If you have any comments or questions, please contact John Reynolds (review engineer), Barry Andrews (BACT), or Tom Rogers (modeling) at the above address or at (904)488-1344.

Sincerely,

Patricia G. Adams

Patricia G. Adams
Planner
Bureau of Air Regulation

/pa

Enclosure

BEST AVAILABLE COPY

TARMAC FLORIDA, INC.

P.O. Box 2998
Hialeah, Florida 33012

August 31, 1989

RECEIVED
DER - MAIL ROOM
1989 SEP -5 AM 9:37

Mr. Clair Fancy, P.E.
Division of Air Resources Management
Fla. Department of Environmental Regulation
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

RE: **Application For Major Modification**
Pennsuco Cement & Supply
Permit No. AO13-157297

Dear Mr. Fancy:

Tarmac is pleased to submit an *Application To Operate/Construct Air Pollution Sources* for the modification of Kiln 2 to burn coal as primary fuel. Included as part of the submittal is a PSD application, BACT evaluation, and air quality analysis. Additionally, a check in the amount of $5000.00 is enclosed for the permit processing fee.

Tarmac looks forward to working with you and your staff on this project. Please do not hesitate to contact me or Scott Quaas of this office regarding any questions or further information you may need. The telephone number is (305)823-8800.

Sincerely,

Albert Townsend
Manager
Real Estate & Environmental

cc: K. Riveira
D. Bailey
S. Quaas
D. Buff - KBN Engineering
S. Brooks - FDER, SE Dist.
[illegible] [illegible], DERM
[illegible]
[illegible]

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PACKAGE TRACKING NUMBER 40536053[illegible]

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1 From (Your Name) Please Print: [illegible]avid A. Buff
Your Phone Number (Very Important): (904) 375-8000
Company: [illegible]
Department/Floor No.:
Street Address: [illegible]
City: [illegible] State: FL ZIP Required: [illegible]

2 To (Recipient's Name) Please Print: Mr. Clair Tancy
Recipient's Phone Number (Very Important): (904) 488-[illegible]
Company: Fla. Dept. of Environmental Regulati[illegible]
Department/Floor No.:
Exact Street Address (We Cannot Deliver to P.O. Boxes or P.O. ® Zip Codes.): 2600 Blair Stone Road
City: Tallahassee State: FL ZIP Required: 32399-240[illegible]

3 YOUR BILLING REFERENCE INFORMATION (FIRST 24 CHARACTERS WILL APPEAR ON INVOICE.)
[illegible]9024

H IF HOLD FOR PICK-UP, Print FEDEX Address Here
Street Address
City State ZIP Required

PAYMENT [X] Bill Sender [ ] Bill Recipient's FedEx Acct. No. [ ] Bill 3rd Party FedEx Acct. No. [ ] Bill Credit Card
[ ] Cash [redacted]

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7 [ ]
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9 [ ]
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10 [ ]

*Declared Value Limit $100.

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3 DELIVER SATURDAY (Extra charge) [ ]
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5 [ ] CONSTANT SURVEILLANCE SERVICE (CSS) (Extra charge) (Release Signature Not Applicable)
6 [ ] DRY ICE ______ Lbs.
7 [ ] OTHER SPECIAL SERVICE ______
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9 [ ] SATURDAY PICK-UP (Extra charge)
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11 [ ]
12 [ ] HOLIDAY DELIVERY (If offered) (Extra charge)

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5 Sender authorizes Federal Express to deliver this shipment without obtaining a delivery signature and shall indemnify and hold harmless Federal Express from any claims resulting therefrom.

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Federal Express Use
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Declared Value Charge
Other 1
Other 2
Total Charges

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TARMAC FLORIDA, INC.
P.O. BOX 8648, DEERFIELD BEACH, FL 33443

66-798
531

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NCNB NATIONAL BANK, ASHEVILLE, NORTH CAROLINA

FIVE THOUSAND DOLLARS NO CENTS

PAY TO THE ORDER OF

FLA DEPT OF ENVIRONMENTAL
REGULATION

DATE	CHECK AMOUNT
8-25-89	*****5,000.00

[redacted]

Division of Air Resources Management
Fla. Department of Environmental Regulation
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

RECEIVED
R - MAIL ROOM
SEP -5 AM 9:37

RE: **Application For Major Modification**
Pennsuco Cement & Supply
Permit No. AO13-157297

Dear Mr. Fancy:

Tarmac is pleased to submit an *Application To Operate/Construct Air Pollution Sources* for the modification of Kiln 2 to burn coal as primary fuel. Included as part of the submittal is a PSD application, BACT evaluation, and air quality analysis. Additionally, a check in the amount of $5000.00 is enclosed for the permit processing fee.

Tarmac looks forward to working with you and your staff on this project. Please do not hesitate to contact me or Scott Quaas of this office regarding any questions or further information you may need. The telephone number is (305)823-8800.

Sincerely,

Albert Townsend
Manager
Real Estate & Environmental

1032

cc: K. Riveira
D. Bailey
S. Quaas
D. Buff - KBN Engineering
S. Brooks - FDER, SE Dist.

PSD PERMIT APPLICATION
KILN 2 COAL CONVERSION
TARMAC FLORIDA, INC.
AUGUST 1989

$5000 pd.
9-5-89
Recpt. 117657

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL REGULATION

TWIN TOWERS OFFICE BUILDING
2600 BLAIR STONE ROAD
TALLAHASSEE, FLORIDA 32301

AC 13-169901
PSD-FL-142

BOB GRAHAM
GOVERNOR

VICTORIA J. TSCHINKEL
SECRETARY

APPLICATION TO OPERATE/CONSTRUCT AIR POLLUTION SOURCES

SOURCE TYPE: Portland Cement Mfg. [ ] New[1] [X] Existing[1]

APPLICATION TYPE: [ ] Construction [ ] Operation [X] Modification

COMPANY NAME: TARMAC FLORIDA, INC. COUNTY: Dade

Identify the specific emission point source(s) addressed in this application (i.e. Lime Kiln No. 4 with Venturi Scrubber; Peaking Unit No. 2, Gas Fired) Kiln No. 2

SOURCE LOCATION: Street 11000 NW 121 Way City Medley

UTM: East 17 - 562.8 North 2861.7

Latitude 25 ° 52 ' 30 "N Longitude 80 ° 22 ' 30 "W

APPLICANT NAME AND TITLE: Scott Quaas -- Environmental Specialist

APPLICANT ADDRESS: P.O. Box 2998, Hialeah, Florida 33012

SECTION I: STATEMENTS BY APPLICANT AND ENGINEER

A. APPLICANT

I am the undersigned owner or authorized representative* of TARMAC FLORIDA, INC.

I certify that the statements made in this application for a construction/modification permit are true, correct and complete to the best of my knowledge and belief. Further, I agree to maintain and operate the pollution control source and pollution control facilities in such a manner as to comply with the provision of Chapter 403, Florida Statutes, and all the rules and regulations of the department and revisions thereof. I also understand that a permit, if granted by the department, will be non-transferable and I will promptly notify the department upon sale or legal transfer of the permitted establishment.

*Attach letter of authorization

Signed: [signature]

Scott Quaas - Environmental Specialist
Name and Title (Please Type)

Date: 8/31/89 Telephone No. (305)823-8800

B. PROFESSIONAL ENGINEER REGISTERED IN FLORIDA (where required by Chapter 471, F.S.)

This is to certify that the engineering features of this pollution control project have been ~~designed~~/examined by me and found to be in conformity with modern engineering principles applicable to the treatment and disposal of pollutants characterized in the permit application. There is reasonable assurance, in my professional judgment, that

[1] See Florida Administrative Code Rule 17-2.100(57) and (104)

the pollution control facilities, when properly maintained and operated, will discharge an effluent that complies with all applicable statutes of the State of Florida and the rules and regulations of the department. It is also agreed that the undersigned will furnish, if authorized by the owner, the applicant a set of instructions for the proper maintenance and operation of the pollution control facilities and, if applicable, pollution sources.

Signed David A. Buff

David A. Buff
Name (Please Type)

KBN Engineering & Applied Sciences, Inc.
Company Name (Please Type)

P.O. Box 14288, Gainesville, Florida 32604
Mailing Address (Please Type)

Florida Registration No. 19011 Date: 8/31/89 Telephone No. (904)375-8000

SECTION II: GENERAL PROJECT INFORMATION

A. Describe the nature and extent of the project. Refer to pollution control equipment, and expected improvements in source performance as a result of installation. State whether the project will result in full compliance. Attach additional sheet if necessary.

Project is for the conversion of the kiln #2 system to coal and will include a 12,000 pound per hour minimum direct fired coal system. No additional control equipment will be required. Oil will remain for startup/backup fuel. Project will result in full compliance.

B. Schedule of project covered in this application (Construction Permit Application Only)

Start of Construction ASAP Completion of Construction 18 months

C. Costs of pollution control system(s): (Note: Show breakdown of estimated costs only for individual components/units of the project serving pollution control purposes. Information on actual costs shall be furnished with the application for operation permit.)

NA - no additional control systems

D. Indicate any previous DER permits, orders and notices associated with the emission point, including permit issuance and expiration dates.

A013-157297 Issued: 2 February 1989 Expires: 15 November 1993

E. Requested permitted equipment operating time: hrs/day 24 ; days/wk 7 ; wks/yr 52 ;
if power plant, hrs/yr ____; if seasonal, describe: ____

F. If this is a new source or major modification, answer the following questions. (Yes or No)

1. Is this source in a non-attainment area for a particular pollutant? YES

   a. If yes, has "offset" been applied? NO

   b. If yes, has "Lowest Achievable Emission Rate" been applied? NO

   c. If yes, list non-attainment pollutants. ozone

2. Does best available control technology (BACT) apply to this source? If yes, see Section VI. ~~YES~~

3. Does the State "Prevention of Significant Deterioriation" (PSD) requirement apply to this source? If yes, see Sections VI and VII. YES

4. Do "Standards of Performance for New Stationary Sources" (NSPS) apply to this source? NO

5. Do "National Emission Standards for Hazardous Air Pollutants" (NESHAP) apply to this source? NO

H. Do "Reasonably Available Control Technology" (RACT) requirements apply to this source? NO

   a. If yes, for what pollutants? ____

   b. If yes, in addition to the information required in this form, any information requested in Rule 17-2.650 must be submitted.

Attach all supportive information related to any answer of "Yes". Attach any justification for any answer of "No" that might be considered questionable.

SECTION III: AIR POLLUTION SOURCES & CONTROL DEVICES (Other than Incinerators)

A. Raw Materials and Chemicals Used in your Process, if applicable:

Description	Contaminants Type	Contaminants % Wt	Utilization Rate - lbs/hr	Relate to Flow Diagram
limestone	particulates		71,280	1
ash & mineral aggregates	particulates		8,505	1
sand	particulates		1,215	1

B. Process Rate, if applicable: (See Section V, Item 1)

1. Total Process Input Rate (lbs/hr): 81,000

2. Product Weight (lbs/hr): 50,000

C. Airborne Contaminants Emitted: (Information in this table must be submitted for each emission point, use additional sheets as necessary)

Name of Contaminant	Emission[1] Maximum lbs/hr	Emission[1] Actual T/yr	Allowed[2] Emission Rate per Rule 17-2	Allowable[3] Emission lbs/hr	Potential[4] Emission lbs/yr	Potential[4] Emission T/yr	Relate to Flow Diagram
particulates	31.30	137.10	$E=17.31P^{0.16}$	31.30			2
SO_2	400	1752	16.0 lb/t*	400			2
NO_x	169.25	741.30	6.77 lb/t*	169.25			2

[1]See Section V, Item 2.

[2]Reference applicable emission standards and units (e.g. Rule 17-2.600(5)(b)2. Table II, E. (1) - 0.1 pounds per million BTU heat input)

[3]Calculated from operating rate and applicable standard.

[4]Emission, if source operated without control (See Section V, Item 3).

* - lb/ton clinker produced

D. Control Devices: (See Section V, Item 4)

Name and Type (Model & Serial No.)	Contaminant	Efficiency	Range of Particles Size Collected (in microns) (If applicable)	Basis for Efficiency (Section V Item 5)
Koppers	particulates	±99.8%	5-100	mfg.
Electrostatic				
Precipitator				

E. Fuels

Type (Be Specific)	Consumption*		Maximum Heat Input (MMBTU/hr)
	avg/hr	max./hr	
coal	12,000	13,000	162.5
fuel oil (startup/backup)	1,160	1,170	162.5

*Units: Natural Gas--MMCF/hr; Fuel Oils--gallons/hr; Coal, wood, refuse, other--lbs/hr.

Fuel Analysis: coal

Percent Sulfur: ≤ 2 Percent Ash: 10

Density: NA lbs/gal Typical Percent Nitrogen: ± 1.5

Heat Capacity: 12,500 BTU/lb ______ BTU/gal

Other Fuel Contaminants (which may cause air pollution): ______

F. If applicable, indicate the percent of fuel used for space heating.

Annual Average ______ Maximum ______

G. Indicate liquid or solid wastes generated and method of disposal.

Precipitator dust is insufflated into system

Ash absorbed into clinker

H. Emission Stack Geometry and Flow Characteristics (Provide data for each stack):

Stack Height: 200 ft. Stack Diameter: 8 ft.

Gas Flow Rate: 90,000 ACFM 47,000 DSCFM Gas Exit Temperature: 300 °F.

Water Vapor Content: 23 - 27 % Velocity: 29.8 FPS

SECTION IV: INCINERATOR INFORMATION

Type of Waste	Type 0 (Plastics)	Type I (Rubbish)	Type II (Refuse)	Type III (Garbage)	Type IV (Pathological)	Type V (Liq.& Gas By-prod.)	Type VI (Solid By-prod.)
Actual lb/hr Inciner-ated							
Uncon-trolled (lbs/hr)							

Description of Waste ______

Total Weight Incinerated (lbs/hr) ______ Design Capacity (lbs/hr) ______

Approximate Number of Hours of Operation per day ______ day/wk ______ wks/yr. ______

Manufacturer ______

Date Constructed ______ Model No. ______

	Volume $(ft)^3$	Heat Release (BTU/hr)	Fuel Type	Fuel BTU/hr	Temperature (°F)
Primary Chamber					
Secondary Chamber					

Stack Height: ______ ft. Stack Diamter: ______ Stack Temp. ______

Gas Flow Rate: ______ ACFM ______ DSCFM* Velocity: ______ FPS

*If 50 or more tons per day design capacity, submit the emissions rate in grains per standard cubic foot dry gas corrected to 50% excess air.

Type of pollution control device: [ ] Cyclone [ ] Wet Scrubber [ ] Afterburner

[ ] Other (specify) ______

Brief description of operating characteristics of control devices: ________________

____

____

____

____

Ultimate disposal of any effluent other than that emitted from the stack (scrubber water, ash, etc.):

____

____

____

____

NOTE: Items 2, 3, 4, 6, 7, 8, and 10 in Section V must be included where applicable.

SECTION V: SUPPLEMENTAL REQUIREMENTS

Please provide the following supplements where required for this application.

1. Total process input rate and product weight -- show derivation [Rule 17-2.100(127)]

2. To a construction application, attach basis of emission estimate (e.g., design calculations, design drawings, pertinent manufacturer's test data, etc.) and attach proposed methods (e.g., FR Part 60 Methods 1, 2, 3, 4, 5) to show proof of compliance with applicable standards. To an operation application, attach test results or methods used to show proof of compliance. Information provided when applying for an operation permit from a construction permit shall be indicative of the time at which the test was made.

3. Attach basis of potential discharge (e.g., emission factor, that is, AP42 test).

4. With construction permit application, include design details for all air pollution control systems (e.g., for baghouse include cloth to air ratio; for scrubber include cross-section sketch, design pressure drop, etc.)

5. With construction permit application, attach derivation of control device(s) efficiency. Include test or design data. Items 2, 3 and 5 should be consistent: actual emissions = potential (1-efficiency).

6. An 8 1/2" x 11" flow diagram which will, without revealing trade secrets, identify the individual operations and/or processes. Indicate where raw materials enter, where solid and liquid waste exit, where gaseous emissions and/or airborne particles are evolved and where finished products are obtained.

7. An 8 1/2" x 11" plot plan showing the location of the establishment, and points of airborne emissions, in relation to the surrounding area, residences and other permanent structures and roadways (Example: Copy of relevant portion of USGS topographic map).

8. An 8 1/2" x 11" plot plan of facility showing the location of manufacturing processes and outlets for airborne emissions. Relate all flows to the flow diagram.

9. The appropriate application fee in accordance with Rule 17-4.05. The check should be made payable to the Department of Environmental Regulation.

10. With an application for operation permit, attach a Certificate of Completion of Construction indicating that the source was constructed as shown in the construction permit.

SECTION VI: BEST AVAILABLE CONTROL TECHNOLOGY

A. Are standards of performance for new stationary sources pursuant to 40 C.F.R. Part 60 applicable to the source?

[ ] Yes [ ] No

Contaminant	Rate or Concentration

B. Has EPA declared the best available control technology for this class of sources (If yes, attach copy)

[ ] Yes [ ] No

Contaminant	Rate or Concentration

C. What emission levels do you propose as best available control technology?

Contaminant	Rate or Concentration

D. Describe the existing control and treatment technology (if any).

1. Control Device/System:
2. Operating Principles:
3. Efficiency:*
4. Capital Costs:

*Explain method of determining

5. Useful Life:

6. Operating Costs:

7. Energy:

8. Maintenance Cost:

9. Emissions:

Contaminant	Rate or Concentration

10. Stack Parameters

a. Height: ft.

b. Diameter: ft.

c. Flow Rate: ACFM

d. Temperature: °F.

e. Velocity: FPS

E. Describe the control and treatment technology available (As many types as applicable use additional pages if necessary).

1.

a. Control Device:

b. Operating Principles:

c. Efficiency:[1]

d. Capital Cost:

e. Useful Life:

f. Operating Cost:

g. Energy:[2]

h. Maintenance Cost:

i. Availability of construction materials and process chemicals:

j. Applicability to manufacturing processes:

k. Ability to construct with control device, install in available space, and operat within proposed levels:

2.

a. Control Device:

b. Operating Principles:

c. Efficiency:[1]

d. Capital Cost:

e. Useful Life:

f. Operating Cost:

g. Energy:[2]

h. Maintenance Cost:

i. Availability of construction materials and process chemicals:

[1]Explain method of determining efficiency.
[2]Energy to be reported in units of electrical power - KWH design rate.

j. Applicability to manufacturing processes:

k. Ability to construct with control device, install in available space, and operate within proposed levels:

3.

a. Control Device:

b. Operating Principles:

c. Efficiency:[1]

d. Capital Cost:

e. Useful Life:

f. Operating Cost:

g. Energy:[2]

h. Maintenance Cost:

i. Availability of construction materials and process chemicals:

j. Applicability to manufacturing processes:

k. Ability to construct with control device, install in available space, and operate within proposed levels:

4.

a. Control Device:

b. Operating Principles:

c. Efficiency:[1]

d. Capital Costs:

e. Useful Life:

f. Operating Cost:

g. Energy:[2]

h. Maintenance Cost:

i. Availability of construction materials and process chemicals:

j. Applicability to manufacturing processes:

k. Ability to construct with control device, install in available space, and operate within proposed levels:

F. Describe the control technology selected:

1. Control Device:

2. Efficiency:[1]

3. Capital Cost:

4. Useful Life:

5. Operating Cost:

6. Energy:[2]

7. Maintenance Cost:

8. Manufacturer:

9. Other locations where employed on similar processes:

a. (1) Company:

(2) Mailing Address:

(3) City:

(4) State:

[1]Explain method of determining efficiency.
[2]Energy to be reported in units of electrical power - KWH design rate.

(5) Environmental Manager:

(6) Telephone No.:

(7) Emissions:[1]

Contaminant	Rate or Concentration

(8) Process Rate:[1]

b. (1) Company:

(2) Mailing Address:

(3) City: (4) State:

(5) Environmental Manager:

(6) Telephone No.:

(7) Emissions:[1]

Contaminant	Rate or Concentration

(8) Process Rate:[1]

10. Reason for selection and description of systems:

[1]Applicant must provide this information when available. Should this information not be available, applicant must state the reason(s) why.

SECTION VII - PREVENTION OF SIGNIFICANT DETERIORATION

A. Company Monitored Data

1. ____________ no. sites ____________ TSP ____________ ( ) SO^2* ____________ Wind spd/dir

Period of Monitoring ____ / ____ / ____ to ____ / ____ / ____
month day year month day year

Other data recorded ________________________________

Attach all data or statistical summaries to this application.

*Specify bubbler (B) or continuous (C).

2. Instrumentation, Field and Laboratory

a. Was instrumentation EPA referenced or its equivalent? [ ] Yes [ ] No

b. Was instrumentation calibrated in accordance with Department procedures?

[ ] Yes [ ] No [ ] Unknown

B. Meteorological Data Used for Air Quality Modeling

1. _____ Year(s) of data from ____/____/____ to ____/____/____
month day year month day year

2. Surface data obtained from (location)____________________

3. Upper air (mixing height) data obtained from (location)____________________

4. Stability wind rose (STAR) data obtained from (location)____________________

C. Computer Models Used

1. ____________________ Modified? If yes, attach description.

2. ____________________ Modified? If yes, attach description.

3. ____________________ Modified? If yes, attach description.

4. ____________________ Modified? If yes, attach description.

Attach copies of all final model runs showing input data, receptor locations, and principle output tables.

D. Applicants Maximum Allowable Emission Data

Pollutant	Emission Rate
TSP	____________________ grams/sec
SO^2	____________________ grams/sec

E. Emission Data Used in Modeling

Attach list of emission sources. Emission data required is source name, description of point source (on NEDS point number), UTM coordinates, stack data, allowable emissions, and normal operating time.

F. Attach all other information supportive to the PSD review.

G. Discuss the social and economic impact of the selected technology versus other applicable technologies (i.e., jobs, payroll, production, taxes, energy, etc.). Include assessment of the environmental impact of the sources.

H. Attach scientific, engineering, and technical material, reports, publications, journals, and other competent relevant information describing the theory and application of the requested best available control technology.

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1.0 INTRODUCTION

Tarmac Florida, Inc. leases and operates a Portland cement manufacturing plant in northwest Dade County, just east of the Turnpike Extension and south of U.S. 27 (Figure 1-1). Currently, the Tarmac facility consists of three cement kilns which have valid air operating permits issued by the Florida Department of Environmental Regulation (FDER) and Dade County Environmental Resources Management (DERM). Kilns 1 and 2 are permitted to burn natural gas or No. 6 fuel oil, and each have a production capacity of 25.0 tons per hour (TPH) of clinker. Kiln 3 is a larger kiln which is permitted to burn coal, natural gas, or No. 6 fuel oil and has a capacity of 87.5 TPH clinker.

In keeping with Tarmac's longstanding policy of promoting energy efficiency and utilizing domestic fuel sources, Tarmac is now proposing to convert Kiln 2 to coal. Tarmac applied for and received a federal Prevention of Significant Deterioration (PSD) permit to convert Kilns 1, 2, and 3 to coal in 1984. However, this PSD permit was issued 4 years ago and may no longer be considered valid for conversion of Kiln 2 to coal, since this conversion was not accomplished within a reasonable time period after issuance of the permit. Furthermore, this PSD permit limited sulfur dioxide (SO_2) emissions from Kiln 2 to 125 pounds per hour (lb/hr). Based on extensive experience in burning coal in Kiln 3, this emission level is not appropriate. As a result, Tarmac is currently requesting an SO_2 emission limit of 400 lb/hr on Kiln 2 after coal conversion.

The coal conversion will increase actual emissions of certain regulated air pollutants over current emissions from Kiln 2. The U.S. Environmental Protection Agency (USEPA) and FDER have implemented regulations which require a PSD review for new or modified sources which increase air emissions above certain threshold amounts. Because the threshold amounts will be exceeded by the proposed project, the project is subject to PSD review. PSD regulations are promulgated under 40 Code of Federal Regulations (CFR) Part 52.21 and implemented through Florida's

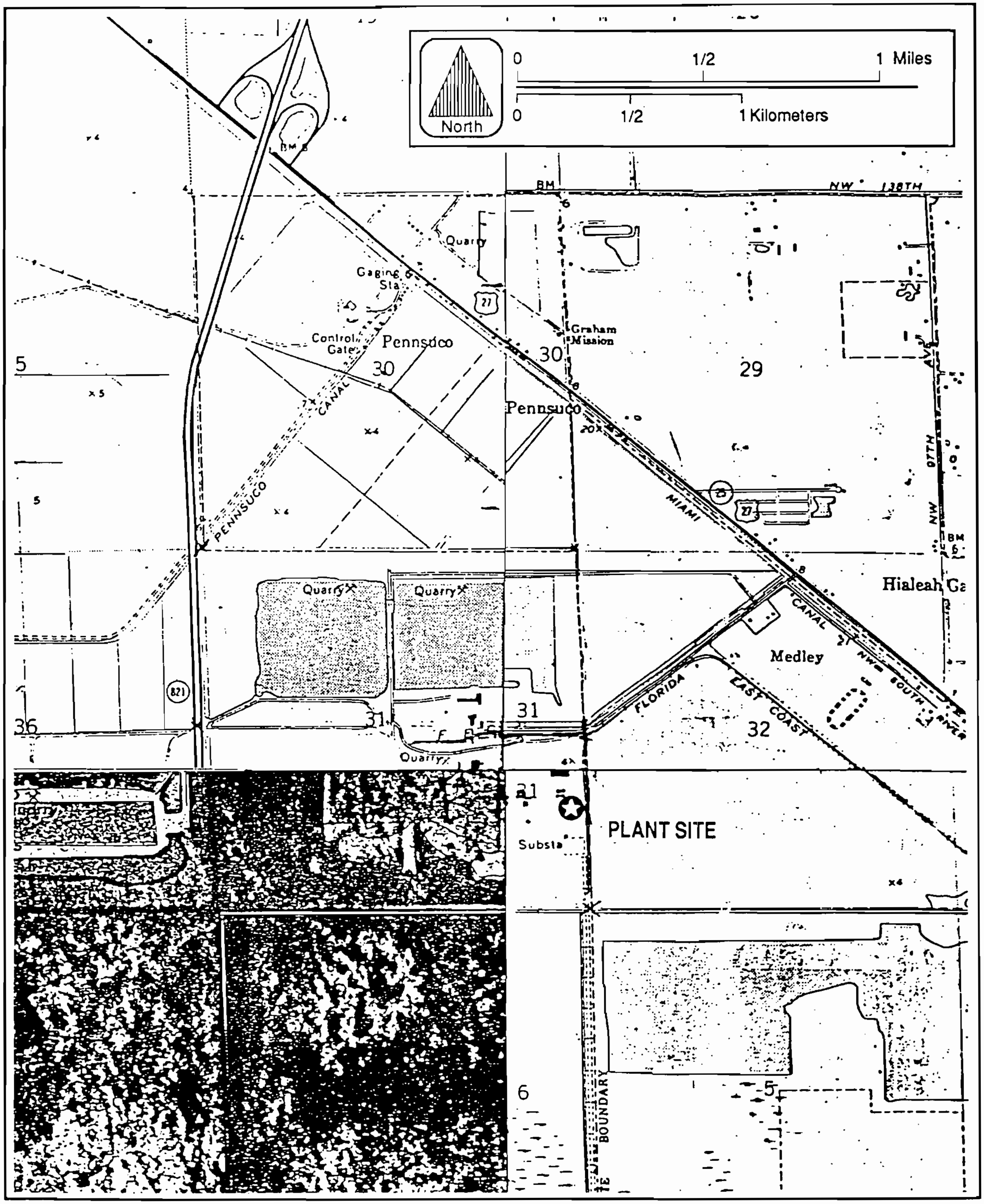

Figure 1-1 LOCATION OF TARMAC FLORIDA FACILITY

KBN

State Implementation Plan. FDER's PSD regulations are codified in Chapter 17-2.510, Florida Administrative Code (F.A.C.).

The technical information and analysis required by the federal and state PSD regulations are contained in this PSD application. The application is divided into eight major sections. Presented in Section 2.0 is a description of the facility, including air emissions and stack parameters. PSD review requirements and applicability are presented in Section 3.0. The control technology review, including the Best Available Control Technology (BACT) evaluation, is presented in Section 4.0. Air quality monitoring information is presented in Section 5.0, and the methodology and results of the impact analyses performed for the project are presented in Sections 6.0, 7.0, and 8.0.

2.0 PROJECT DESCRIPTION

2.1 PROCESS DESCRIPTION AND EMISSIONS

Tarmac is proposing to convert the existing Kiln 2 to burn coal. The kiln is currently permitted to burn natural gas and No. 6 fuel oil under FDER operating permit AO13-157297. Kiln 2 has been inactive since 1982 due to low demand for cement, but work is underway for startup of the kiln on gas/oil (under the existing permit) for 1/1/90.

A flow diagram of the kiln system after coal conversion is presented in Figure 2-1. The modifications to the kiln will consist of the addition of direct-fired coal burner and the replacement of the chain system to provide better energy efficiency within the kiln. Provisions will also be made to convey raw coal from storage to a new coal mill and then to the kiln. The existing kiln feed system, clinker cooler, clinker cooler electrostatic precipitator (ESP), waste dust storage, dust insufflation system, and kiln ESP will be utilized.

The current production capacity of the kiln of 25 TPH clinker will not increase as a result of this coal conversion. Coal for Kiln 2 will be received, stored, and conveyed through the existing coal handling system for Kiln 3. This system consists of an elevated trestle for unloading bottom dump railcars, a temporary coal storage pile, an active coal storage pile, and a loading hopper for transfer to a screen and coal storage bin. Kiln 2 will have a separate coal mill, which will receive screened coal from the existing coal bin, grind it, and fire it directly into the kiln. Hot air from the existing clinker cooler will be used in the coal mill to dry the coal and pneumatically convey it to the kiln. This direct air-fired system will not have an air emission point, since the coal and air are injected directly into the kiln. Two new conveyor transfer points will be located between the coal storage bin and the new coal mill, but these will be totally enclosed. Therefore, no emissions will result from the new transfer points.

[1] Kiln Feed
[2] Kiln Stack
[3] Kiln Precipitator
[4] Kiln
[5] Waste Dust Storage
[6] Insufflated Dust
[7] Clinker Cooler
[8] Clinker
[9] Cooler Precipitator
[10] Cooler Stack
[11] Coal Storage
[12] Coal Mill

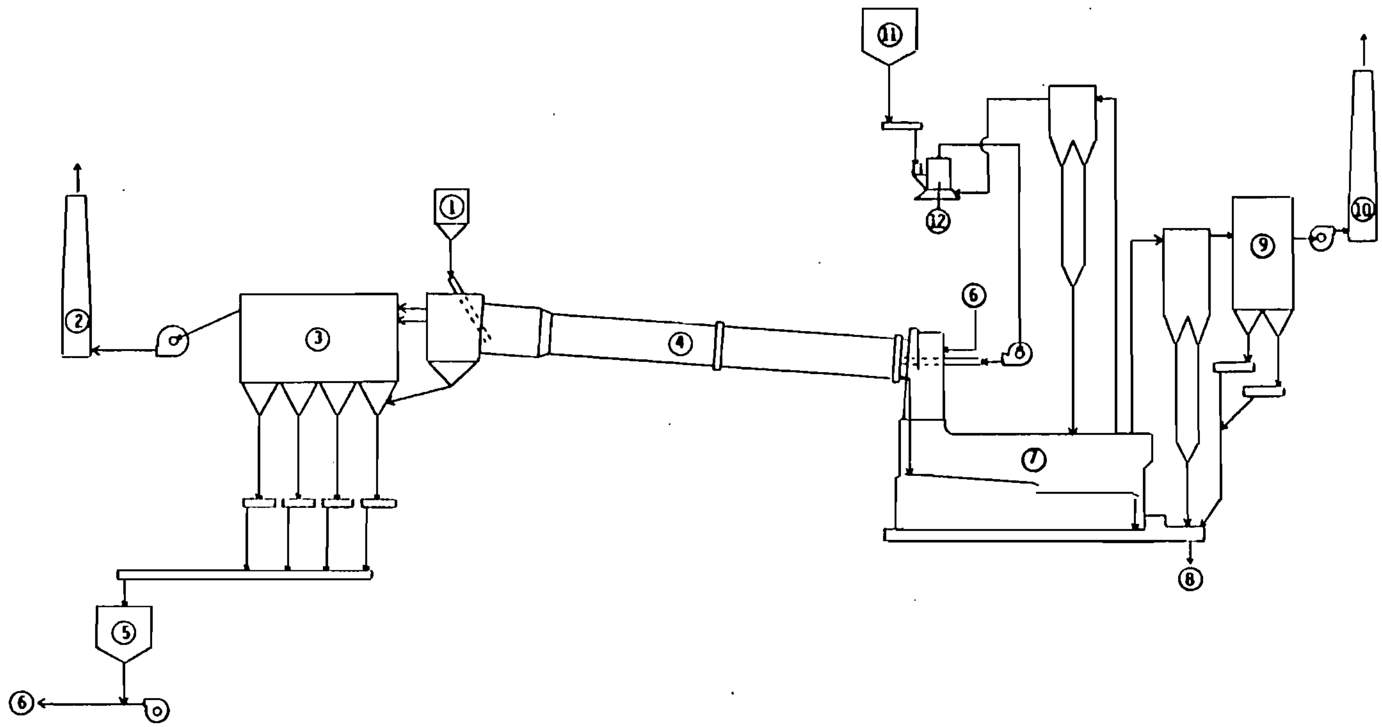

Figure 2-1 FLOW DIAGRAM FOR KILN 2

Current maximum emissions of regulated pollutants from Kiln 2 (based on gas and oil firing) are presented in Table 2-1. Maximum particulate matter-total suspended particulate [PM(TSP)] emissions are based upon the current allowable for the kiln of 31.3 lb/hr (process weight table allowable). PM(TSP) emissions from Kiln 2 have been measured as high as 26.3 lb/hr (March 1982 stack test). Therefore, it is reasonable to assume that the allowable emissions from the kiln represent actual emissions. Emissions of particulate matter with aerodynamic particle size diameter of 10 micrometers (um) or less (PM10) are based upon AP-42 data which indicate that 85 percent of PM(TSP) emissions from Portland cement kilns with ESPs are emitted as PM10 (see Appendix A).

Current SO_2 emissions from Kiln 2 are based upon gas/oil burning. SO_2 emissions tests were conducted on Kilns 1 and 2 when burning fuel oil, and the data were presented in the 1980 application to convert Kiln 2 to coal. SO_2 emissions were stated to be 45.3 lb/hr (refer to Appendix A for supportive information). This emission rate is actually much lower than emissions calculated based upon AP-42 factors for cement kilns.

Current NO_x emissions from Kiln 2 are based upon gas/oil burning. Due to the inactive status of Kiln 2, recent source test data are not available. However, a series of NO_x tests was conducted on the kiln in 1980 while burning both gas and oil (refer to Appendix A). The average of 12 tests burning gas was 4.73 lb/ton clinker, and the average of 12 tests burning oil was 6.71 lb/ton clinker. Based upon these test data, the current NO_x emissions from Kiln 2 are 6.71 lb/ton.

Specific source test data or emission factors are not available concerning carbon monoxide (CO) emissions from cement kilns. However, CO levels in the kiln must be maintained below 0.1 percent in order to eliminate explosion potential in the ESP. CO emissions can therefore be estimated from this CO level and the air flow rate through the kiln. The air flow rate for Kiln 2 when firing oil was approximately 127,000 actual cubic feet per minute (acfm). This equates to 346 lb/hr of CO emissions.

Table 2-1. Baseline and Future Maximum Emissions For Kiln 2 at Tarmac

Pollutant	Baseline (Gas/Oil)		Future (Coal)		Net Increase (lb/hr)
	Basis	lb/hr	Basis	lb/hr	
Particulate Matter (TSP)	Process weight table allowable	31.3	Process weight table allowable	31.3	0.0
Particulate Matter (PM10)	AP-42: 85% of PM(TSP) emissions	26.6	AP-42: 85% of PM(TSP) emissions	26.6	0.0
Sulfur Dioxide	Gas/oil-firing test data	45.3	Coal firing- 16.0 lb/ton clinker 2.27	400.0.	354.7
Nitrogen Oxides	Gas/oil-firing 6.71 lb/ton clinker	167.8	Coal firing- 6.77 lb/ton clinker	169.3	1.5
Carbon Monoxide	0.1% concentration	346.0	No increase over current (<0.1%)	346.0	0.0
Volatile Organic Compounds	Source testing on Kiln 3	23.1	Coal firing 1.2 lb/ton clinker	30.0	6.9
Lead	AP-42: 0.10 lb/ton clinker	2.5	AP-42: 0.10 lb/ton clinker	2.5	0.0
Sulfuric Acid Mist	3% of SO_2 emissions	1.7	3% of SO_2 emissions	12.0	10.3
Beryllium	0.002 lb/ton clinker	0.05	0.002 lb/ton clinker	0.05	0.0
Other Regulated Pollutants	No data	--	No data	--	--

Little information is available regarding emissions of volatile organic compounds (VOCs) from Portland cement kilns. However, Tarmac has recently conducted VOC testing on Kiln 3 as part of testing to burn contaminated soils (July 5, 1988, testing-- refer to Appendix A). The testing showed that the majority of VOC emissions are due to organics in the raw feed. Based upon the coal feed rate during the testing and using AP-42 emission factors for coal combustion in boilers, the contribution of coal burning to the total VOC emissions can be estimated. The emissions due to coal burning can then be subtracted from the total VOC emissions to obtain the VOC emissions due to the raw feed. The resulting VOC emission rate is 0.87 lb/ton clinker (refer to Appendix A). To obtain baseline VOC emissions due to gas/oil burning, the VOC emissions due to the raw feed must be added to VOC emissions due to fuel burning. Burning No. 6 fuel oil results in VOC emissions of 1.3 lb/hr, and total VOC emissions due to the raw feed and fuel oil burning are 23.1 lb/hr.

Baseline emissions of lead (Pb) are based upon the AP-42 factor for cement kilns of 0.10 lb/ton clinker (refer to Appendix A) and the kiln capacity of 25.0 TPH. Emission factors for sulfuric acid mist are not available. Review of the literature concerning oil and coal combustion sources indicates that approximately 3 percent of the SO_2 emissions is sulfuric acid mist. This estimate was used to calculate baseline emissions from Kiln 2.

Baseline emissions of beryllium were based upon USEPA's recent publication entitled Toxic Air Pollutant Emission Factors (USEPA, 1988a). The factor is 0.002 lb/ton clinker. Data are not available concerning the emissions of other regulated pollutants from Portland cement kilns.

Future maximum emissions of regulated pollutants from Kiln 2, after coal conversion, are also shown in Table 2-1. Future PM(TSP) and PM10 emissions will not change as a result of the conversion to coal. The existing ESP is capable of accommodating the small additional dust generated due to the ash in the coal, a majority of which will remain in the clinker and become part of the product.

Future maximum SO_2 emissions will be 400 lb/hr (16.0 lb/ton clinker produced) from Kiln 2 when burning coal with 2.0 percent sulfur content or less. This level of SO_2 emissions is for coal burning and is based upon experience with coal burning in Kiln 3. After considerable difficulty in meeting original SO_2/NO_x emission limits on Kiln 3, the SO_2 emission limit for Kiln 3 was revised to 4.6 lb/ton clinker. This limit can be met simultaneously with NO_x limits by utilizing strict control over process conditions within the kiln (combustion temperature, excess air, and dust insufflation rate). Tarmac is requesting a higher SO_2 limit for Kiln 2 because of the uncertainties associated with operation of this smaller kiln and in achieving simultaneous NO_x control. After source testing is conducted on Kiln 2 for coal burning, test data will be evaluated. Tarmac will be willing to consider a lower SO_2 emission limit at that time if the data support a reduced level.

Future maximum NO_x emissions when burning coal in Kiln 2 are 6.77 lb/ton clinker, or 169.3 lb/hr. This limit is based upon the current limit on Kiln 3 of 6.77 lb/ton clinker.

Future CO emissions from Kiln 2 when burning coal should not increase over current emissions when burning gas and oil. This is because process conditions within the kiln and ESP demand that CO be held to below 0.1 percent. CO is minimized in the kiln in order to maximize combustion efficiency and promote energy efficiency. Air flow through the Kiln 2 after conversion to coal will decrease compared to previous gas/oil firing, because of the better energy efficiency of the kiln burner and chain system. Based on these considerations, future CO emissions when burning coal are equal to baseline emission levels.

Future maximum VOC emissions from Kiln 2 burning coal are based upon the VOC emissions due to the raw feed, estimated from Kiln 3 data (refer to previous discussion) plus the VOC emissions due to coal burning. Based on the AP-42 factor of 0.10 lb/ton coal and the maximum coal feed rate to Kiln 2 of 6.50 TPH, VOC emissions due to coal burning are 0.7 lb/hr. VOC emissions due to the raw feed are 0.87 lb/ton clinker, or 21.8 lb/hr. Total future VOC emissions are therefore 22.5 lb/hr. Due to the limited database and potential variability in the organic content of the raw feed, Tarmac is requesting a higher future limit of 30.0 lb/hr.

Future maximum emissions of other regulated pollutants were estimated in the same fashion as existing baseline emissions, i.e., by using published emission factors (refer to Appendix A). The emission factors and resulting emissions are presented in Table 2-1.

As described previously, coal for Kiln 2 will be received, stored, and transported using the existing coal handling facilities, with the addition of two new conveyor transfer points and a coal mill. Additional throughput of coal for Kiln 2 will be a maximum of 56,940 TPY. The particulate matter emission sources, emission factors, and resulting emissions are presented in Appendix B. The estimated increase in annual PM(TSP) and PM10 emissions due to operation of Kiln 2 on coal is 12.0 TPY and 5.4 TPY, respectively.

2.2 STACK PARAMETERS

Stack parameters for Kiln 2 after conversion to coal, as well as stack parameters for the other two kilns, are presented in Table 2-2. Also presented are the maximum SO_2 emission rates associated with each kiln. It is noted that Kiln 1 will burn gas as the primary fuel in the future, with oil as backup. There are no plans to convert Kiln 1 to coal. Maximum SO_2 emissions from Kiln 1 are based upon oil firing.

A plot plan of the Tarmac facility is presented in Figure 2-2, with the kiln stacks indicated. The most significant structures at the facility are the finish mill building, the Kiln burner building, the Kiln 1/2 ESP and the Kiln 3/4 ESP.

Table 2-2. TARMAC - K2 Coal Conversion - Stack Parameters and SO_2 Emisssions

Source	Process Product Rate (TPH Clinker)	SO_2 Emission Rate (lb/hr)	Stack Height ft	Stack Height m	Stack Diameter ft	Stack Diameter m	Stack Temp. °F	Stack Temp. °K	Stack Velocity ft/min	Stack Velocity m/s	Flow Rate (acfm)
K1 - gas/oil	25.0	4.5/45.3	200	61	8.0	2.44	378	465	2527	12.84	127,000
K2 - coal	25.0	400.0	200	61	8.0	2.44	300	422	1790	9.10	90,000
K3 - coal	87.5	400.0	200	61	15.0	4.57	350	450	2172	11.04	384,000

Source: Tarmac, 1987

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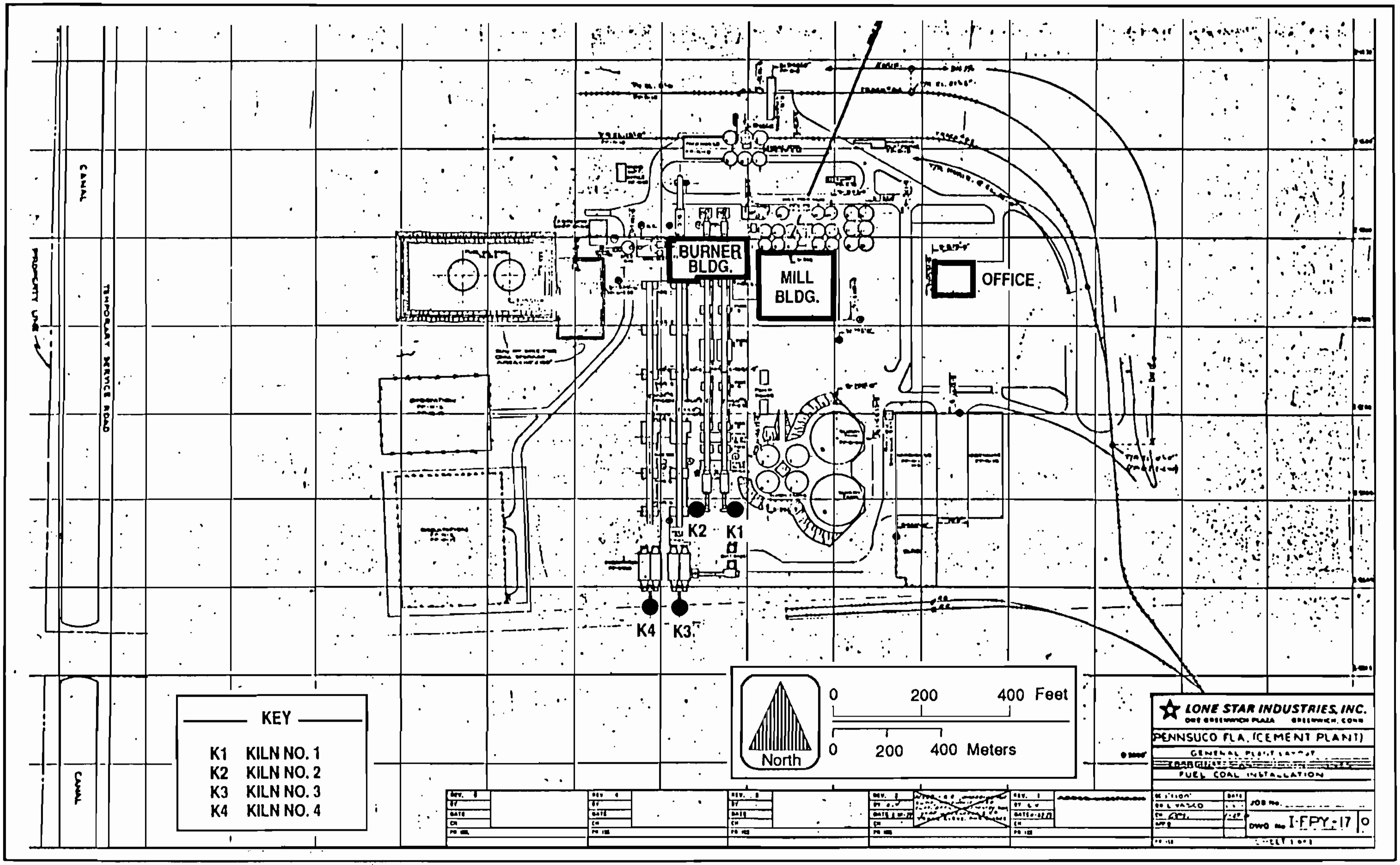

Figure 2-2 PLOT PLAN OF TARMAC FACILITY

The dimensions of these buildings are as follows:

Building	Height	Width	Area of Influence
Finish Mill Building:	106 ft.	260 ft.	530 ft.
Kiln Burner Building:	84 ft.	200 ft.	420 ft.
K1/K2 ESP:	70 ft.	60 ft.	300 ft.
K3/K4 ESP:	90 ft.	130 ft.	450 ft.

The K2 stack is approximately 500 feet from the Finish Mill Building. The K2 stack is just on the edge of the area of influence of the building, and would be affected for only a few specific wind directions when the K2 stack is downwind of the building. The GEP stack height based on this building is 265 feet compared to the K2 stack height of 200 feet.

The K2 stack is outside the area of influence of the burner buildings, and the K2 stack height is more than 2.5 times the width (lesser dimension) of the K1/K2 ESP, and therefore these structures will not cause downwash. The K2 stack is within the area of influence of the K3/K4 ESPs for a few specific wind directions. However, the K3/K4 ESPs are not a solid structure, being open at the bottom. The GEP height of this structure is 225 feet, only slightly greater than the K2 stack height of 200 feet. Based upon these considerations, the downwash potential due to the K3/K4 ESP structures will be minimal.

3.0 AIR QUALITY REVIEW REQUIREMENTS AND APPLICABILITY

The following discussion pertains to the federal and state air regulatory requirements and their applicability to the Tarmac Kiln 2 coal conversion. These regulations must be satisfied before the proposed project can be constructed and operated.

3.1 NATIONAL AND STATE AAQS

The existing applicable National and Florida ambient air quality standards (AAQS) are presented in Table 3-1. Primary National AAQS were promulgated to protect the public health, and secondary National AAQS were promulgated to protect the public welfare from any known or anticipated adverse effects associated with the presence of pollutants in the ambient air. Areas of the country in violation of AAQS are designated as nonattainment areas, and new sources to be located in or near these areas may be subject to more stringent air permitting requirements.

3.2 PSD REQUIREMENTS

3.2.1 General Requirements

Under federal PSD review requirements, all major new or modified sources of air pollutants regulated under the Clean Air Act (CAA) must be reviewed and approved by the USEPA. For sources located in Florida, PSD review and approval has been delegated to FDER.

A "major stationary source" is defined as any one of 28 named source categories which has the potential to emit 100 tons per year (TPY) or more, or any other stationary source which has the potential to emit 250 TPY or more of any pollutant regulated under CAA. "Potential to emit" means the capability, at maximum design capacity, to emit a pollutant after the application of control equipment.

A "major modification" is defined under PSD regulations as a change at an existing major stationary source which increases emissions by greater

Table 3-1. National and State AAQS, Allowable PSD Increments, and Significance Levels (ug/m^3)

Pollutant	Averaging Time	AAQS: National Primary Standard	AAQS: National Secondary Standard	AAQS: State of Florida	PSD Increments Class I	PSD Increments Class II	Significant Impact Levels
Particulate Matter (TSP)	Annual Geometric Mean	NA	NA	NA	5	19	1
	24-Hour Maximum[+]	NA	NA	NA	10	37	5
Particulate Matter (PM10)	Annual Arithmetic Mean	50	50	50	NA	NA	1
	24-Hour Maximum[*]	150	150	150	NA	NA	5
Sulfur Dioxide	Annual Arithmetic Mean	80	NA	60	2	20	1
	24-Hour Maximum[+]	365	NA	260	5	91	5
	3-Hour Maximum[+]	NA	1,300	1,300	25	512	25
Carbon Monoxide	8-Hour Maximum[+]	10,000	10,000	10,000	NA	NA	500
	1-Hour Maximum[+]	40,000	40,000	40,000	NA	NA	2,000
Nitrogen Dioxide	Annual Arithmetic Mean	100	100	100	2.5[**]	25[**]	1
Ozone	1-Hour Maximum[++]	235	235	235	NA	NA	NA
Lead	Calendar Quarter Arithmetic Mean	1.5	1.5	15	NA	NA	NA

[+] Maximum concentration not to be exceeded more than once per year.
[*] Achieved when the expected number of exceedances per year is less than 1.
[**] The State of Florida has not yet adopted the PSD increments for NO_2 concentrations.
[++] Achieved when the expected number of days per year with concentrations above the standard is less than 1.

NA = Not applicable, i.e., no standard exists.

Note: Particulate matter (TSP) refers to total suspended particulate matter.
Particulate mater (PM10) refers to particulate matter with aerodynamic diameter less than or equal to 10 micrometers (μm).

Sources: Federal Register, Vol. 43, No. 118, June 19, 1978.
40 CFR 50
40 CFR 52.21

than "significant" amounts. PSD significant emission rates are shown in Table 3-2.

PSD review is used to determine whether significant air quality deterioration will result from the new or modified source. PSD requirements are contained in 40 CFR 52.21, Prevention of Significant Deterioration of Air Quality. Major sources and modifications are required to undergo the following analysis related to PSD for each pollutant emitted in "significant" amounts:

1. Control technology review,
2. Source impact analysis,
3. Air quality analysis (monitoring),
4. Additional impact analyses.

In addition to these analyses, a new source must also be reviewed with respect to Good Engineering Practice (GEP) stack height regulations. Discussions concerning each of these requirements are presented in the following sections.

3.2.2 Increments/Classifications

In promulgating the 1977 CAA Amendments, Congress specified that certain increases above an air quality "baseline concentration" level of SO_2 and PM(TSP) concentrations would constitute "significant deterioration." The magnitude of the allowable increment depends on the classification of the area in which a new source (or modification) will be located or have an impact. Three classifications were designated based on criteria established in the CAA Amendments. Initially, Congress promulgated areas as Class I (international parks, national wilderness areas, and memorial parks larger than 5,000 acres, and national parks larger than 6,000 acres) or as Class II (all areas not designated as Class I). No Class III areas, which would be allowed greater deterioration than Class II areas, were designated. USEPA then promulgated as regulations the requirements for classifications and area designations.

Table 3-2. PSD Significant Emission Rates and *De Minimis* Monitoring Concentrations

Pollutant	Regulated Under	Significant Emission Rate (TPY)	*De Minimis* Monitoring Concentration ($\mu g/m^3$)
Sulfur Dioxide	NAAQS, NSPS	40	13, 24-hour
Particulate Matter (TSP)	NAAQS, NSPS	25	10, 24-hour
Particulate Matter (PM10)	NAAQS	15	10, 24-hour
Nitrogen Oxides	NAAQS, NSPS	40	14, Annual
Carbon Monoxide	NAAQS, NSPS	100	575, 8-hour
Volatile Organic Compounds (Ozone)	NAAQS, NSPS	40	100 TPY+
Lead	NAAQS	0.6	0.1, 3-month
Sulfuric Acid Mist	NSPS	7	*
Total Fluorides	NSPS	3	0.25, 24-hour
Total Reduced Sulfur	NSPS	10	10, 1-hour
Reduced Sulfur Compounds	NSPS	10	10, 1-hour
Hydrogen Sulfide	NSPS	10	0.2, 1-hour
Asbestos	NESHAP	0.007	*
Beryllium	NESHAP	0.0004	0.001, 24-hour
Mercury	NESHAP	0.1	0.25, 24-hour
Vinyl Chloride	NESHAP	1	15, 24-hour
Benzene	NESHAP	0	*
Radionuclides	NESHAP	0	*
Inorganic Arsenic	NESHAP	0	*

*No ambient measurement method.
+Increases in VOC emissions.

Notes: Ambient monitoring requirements for subject pollutants may be exempted if the impact of the increase in emissions is below air quality impact *de minimis* levels.
NAAQS = National Ambient Air Quality Standards.
NSPS = New Source Performance Standards.
NESHAP = National Emission Standards for Hazardous Air Pollutants.

Sources: 40 CFR 52.21.
Chapter 17-2, F.A.C.

On October 17, 1988, the USEPA promulgated regulations to prevent significant deterioration due to NO_x emissions and established PSD increments for NO_2 concentrations. The USEPA class designations and allowable PSD increments are presented in Table 3-1. The Florida DER has adopted the USEPA class designations and allowable PSD increments for SO_2 and PM(TSP), but has not yet adopted the NO_2 increments.

The term "baseline concentration" evolves from federal and state PSD regulations and denotes a fictitious concentration level corresponding to a specified baseline date and certain additional baseline sources. By definition in the PSD regulations, as amended August 7, 1980, baseline concentration means the ambient concentration level which exists in the baseline area at the time of the applicable baseline date. A baseline concentration is determined for each pollutant for which a baseline date is established and includes:

1. The actual emissions representative of sources in existence on the applicable baseline date; and
2. The allowable emissions of major stationary sources which commenced construction before January 6, 1975, for SO_2 and PM(TSP) sources, or February 8, 1988, for NO_2 sources, but which were not in operation by the applicable baseline date.

The following emissions are not included in the baseline concentration and therefore affect PSD increment consumption:

1. Actual emissions from any major stationary source on which construction commenced after January 6, 1975, for SO_2 and PM(TSP) sources, and after February 8, 1988, for NO_2 sources; and
2. Actual emission increases and decreases at any stationary source occurring after the baseline date.

The term "baseline date" actually includes three different dates:

1. The major source baseline date, which is January 6, 1975, in the cases of SO_2 and PM(TSP), and February 8, 1988, in the case of NO_2.
2. The minor source baseline date, which is the earliest date after the "trigger date" on which a major stationary source or major modification subject to PSD regulations submits a complete PSD application.
3. The "trigger date", which is August 7, 1977, for SO_2 and PM(TSP), and February 8, 1988, for NO_2.

3.2.3 Control Technology Review

The control technology review requirements of the federal PSD regulations require that all applicable federal and state emission limiting standards be met and that Best Available Control Technology (BACT) be applied to control emissions from the source (40 CFR 52.21). The BACT requirements are applicable to all regulated pollutants for which the increase in emissions from the source or modification exceeds the significant emission rate (see Table 3-2).

BACT is defined in 40 CFR 52.21 as:

> An emissions limitation (including a visible emission standard) based on the maximum degree of reduction for each pollutant subject to regulation under the Act...which the Administrator, 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 or available methods, systems, and techniques, including fuel cleaning or treatment or innovative fuel combustion techniques for control of such pollutant.... If the Administrator determines that technological or economic limitations on the application of measurement methodology to a particular emissions unit would make the imposition of an emissions standard infeasible, a design, equipment, work practice, operational standard, or combination thereof, may be prescribed instead to satisfy the requirement for the application of best available control technology.

The requirements for BACT were promulgated within the framework of PSD in the 1977 amendments of the CAA [Public Law 95-95; Part C, Section 165(a)(4)]. The primary purpose of BACT is to optimize consumption of PSD air quality increments and thereby enlarge the potential for future economic growth without significantly degrading air quality (USEPA, 1978; 1980). Guidelines for the evaluation of BACT can be found in USEPA's "Guidelines for Determining Best Available Control Technology (BACT)," (USEPA, 1978) and in the "PSD Workshop Manual" (USEPA, 1980). These guidelines were promulgated by USEPA to provide a consistent approach to BACT and to ensure that the impacts of alternative emission control systems are measured by the same set of parameters. In addition, through implementation of these guidelines, BACT in one area may not be identical to BACT in another area. According to USEPA (1980), "BACT analyses for the same types of emissions unit and the same pollutants in different locations or situations may determine that different control strategies should be applied to the different sites, depending on site-specific factors. Therefore, BACT analyses must be conducted on a case-by-case basis."

The BACT requirements are intended to ensure that the control systems incorporated in the design of a proposed facility reflect the latest in control technologies used in a particular industry and take into consideration existing and future air quality in the vicinity of the proposed facility. BACT must, as a minimum, demonstrate compliance with NSPS for a source (if applicable). An evaluation of the air pollution control techniques and systems, including a cost-benefit analysis of alternative control technologies capable of achieving a higher degree of emission reduction than the proposed control technology, is required. The cost-benefit analysis requires the documentation of the materials, energy, and economic penalties associated with the proposed and alternative control systems, as well as the environmental benefits derived from these systems. A decision on BACT is to be based on sound judgement, balancing environmental benefits with energy, economic, and other impacts (USEPA, 1978).

Historically, a "bottom-up" approach consistent with the BACT Guidelines and Workshop Manual has been used. With this approach, an initial control level, which is usually NSPS, is evaluated against successively more stringent controls until a BACT level is selected. However, USEPA developed a concern that the bottom-up approach was not providing the level of BACT decisions originally intended. As a result, in December 1987 the USEPA Assistant Administrator for Air and Radiation mandated changes in the implementation of the PSD program including the adoption of a new "top-down" approach to BACT decision making.

The top-down approach requires an applicant to start with the most stringent control alternative, usually Lowest Achievable Emission Rate (LAER), and either provide an analysis that justifies its rejection based on technical or economic infeasibility, or propose it as BACT.

The top-down BACT approach essentially starts with the most stringent (or top) technology and emissions limit that have been applied elsewhere to the same source category. The applicant must next provide a basis for rejecting this technology in favor of the next most stringent technology or propose to use it.

Rejection of control alternatives may be based on technical or economical infeasibility. Such decisions are made on the basis of physical differences (e.g., fuel type), locational differences (e.g., availability of water), or significant differences that may exist in the environmental, economic or energy impacts. The differences between the proposed facility and the facility on which the control technique was applied previously must be justified.

3.2.4 Air Quality Analysis

In accordance with requirements of 40 CFR 52.21(m), any application for a PSD permit must contain an analysis of continuous ambient air quality data in the area affected by the proposed major stationary source or major modification. For a new major source, the affected pollutants are those that the source would potentially emit in significant amounts. For a major modification, the pollutants are those for which the net emissions increase exceeds the significant emission rate (see Table 3-2).

According to CAA, ambient air monitoring for a period of up to 1 year is generally appropriate to satisfy the PSD monitoring requirements. A minimum of four (4) months of data is required. Existing data from the vicinity of the proposed source may be utilized if the data meet certain quality assurance requirements; otherwise, additional data may need to be gathered. Guidance in designing a PSD monitoring network is provided in USEPA's "Ambient Monitoring Guidelines for Prevention of Significant Deterioration" (USEPA, 1987a).

The regulations include an exemption which excludes or limits the pollutants for which an air quality analysis must be conducted. This exemption states that the Administrator may exempt a proposed major stationary source or major modification from the monitoring requirements of 40 CFR 52.21(m) with respect to a particular pollutant if the emissions increase of the pollutant from the source or modification would cause, in any area, air quality impacts less than the de minimis levels presented in Table 3-2.

3.2.5 Source Impact Analysis

A source impact analysis must be performed by a proposed major source subject to PSD for each pollutant for which the increase in emissions exceeds the significant emission rate (Table 3-2). The PSD regulations specifically require the use of atmospheric dispersion models in performing impact analysis, estimating baseline and future air quality levels, and determining compliance with AAQS and allowable PSD increments. Designated USEPA models must normally be used in performing the impact analysis. Specific applications for other than USEPA-approved models require USEPA's consultation and prior approval. Guidance for the use and application of dispersion models is presented in the USEPA publication "Guideline on Air Quality Models (Revised)" (USEPA, 1987b).

The source impact analysis for criteria pollutants may be limited to only the new or modified source if the net increase in impacts due to the new or modified source is below significance levels, as presented in Table 3-1.

Various lengths of record for meteorological data can be utilized for impact analysis. A 5-year period can be used with corresponding evaluation of highest, second-highest short-term concentrations for comparison to AAQS or PSD increments. The term "highest, second-highest" (HSH) refers to the highest of the second-highest concentrations at all receptors (i.e., the highest concentration at each receptor is discarded). The second-highest concentration is significant because short-term AAQS specify that the standard should not be exceeded at any location more than once a year. If less than 5 years of meteorological data are used in the modeling analysis, the highest concentration at each receptor must normally be used for comparison to air quality standards.

3.2.6 Additional Impact Analysis

In addition to air quality impact analyses, federal PSD regulations require analyses of the impairment to visibility and the impacts on soils and vegetation that would occur as a result of the proposed source. These analyses are to be conducted primarily for PSD Class I areas. Impacts due to general commercial, residential, industrial, and other growth associated with the source must also be addressed. These analyses are required for each pollutant emitted in significant amounts (Table 3-2).

3.2.7 Good Engineering Practice Stack Height

The 1977 CAA Amendments require that the degree of emission limitation required for control of any pollutant not be affected by a stack height that exceeds GEP, or any other dispersion technique. On July 8, 1985, USEPA promulgated final stack height regulations (USEPA, 1985). GEP stack height is defined as the highest of:

1. 65 meters (m), or
2. A height established by applying the formula:

   $H_g = H + 1.5L$

   where: H_g = GEP stack height,

   H = Height of the structure or nearby structure, and

   L = Lesser dimension (height or projected width) of nearby structure(s), or
3. A height demonstrated by a fluid model or field study.

"Nearby" is defined as a distance up to five times the lesser of the height or width dimensions of a structure or terrain feature, but not greater than 0.8 km. Although GEP stack height regulations require that the stack height used in modeling for determining compliance with AAQS and PSD increments not exceed the GEP stack height, the actual stack height may be greater.

The stack height regulations also allow increased GEP stack height beyond that resulting from the above formula in cases where "plume impaction" occurs. Plume impaction is defined as concentrations measured or predicted to occur when the plume interacts with "elevated terrain." "Elevated terrain" is defined as terrain which exceeds the height calculated by the GEP stack height formula. Because the terrain in the vicinity of the Tarmac plant is flat, plume impaction was not considered in determining the GEP stack height.

3.3 NONATTAINMENT RULES

The Emission Offset Interpretative Ruling (40 CFR 51, Appendix S) applies to new and modified major sources affecting nonattainment areas. Under Section IV.A of the Ruling, such sources are required to: (1) meet an emission limitation which specifies the lowest achievable emission rate for such sources, (2) certify that all existing major sources owned or operated by the applicant in the same state are in compliance with all applicable emission limitations and standards under the Act, (3) obtain emission offsets such that there will be reasonable progress toward attainment of the applicable national AAQS, and (4) demonstrate that the emission offsets would provide a positive net air quality benefit in the affected area [not applicable for VOC or NO_x].

Based on the current nonattainment provisions, all major new sources and modifications to existing major sources located in a nonattainment area must undergo nonattainment review if the proposed pieces of equipment have the potential to emit 100 TPY or more of the nonattainment pollutant, or if the major modification results in a significant net emission increase of the nonattainment pollutant.

3.4 SOURCE APPLICABILITY

3.4.1 PSD Review

3.4.1.1 Pollutant Applicability

The Tarmac plant is located in Dade County, which has been designated by USEPA and FDER as an attainment area for all criteria pollutants except ozone. Because of the ozone nonattainment designation, emissions of VOC from the Tarmac plant will not be subject to PSD review. Dade County is designated as a PSD Class II area for SO_2, PM(TSP), and NO_x. The Tarmac site is located approximately 30 km northeast of the Everglades National Park, the nearest PSD Class I area.

The existing Tarmac plant is considered to be an existing "major stationary source" because current emissions of regulated pollutants exceed 100 TPY. Since the source is an existing major source, PSD review is required for any pollutant for which the net increase in emissions due to the proposed project exceeds the PSD significant emission rates presented in Table 3-2 (i.e., major modification).

Presented in Table 3-3 is the maximum net increase in emissions for each regulated pollutant due to the Kiln 2 coal conversion, based upon the maximum hourly change in emissions presented in Table 2-1, and assuming 8,760 hr/yr operation. Also included is the estimated increase in PM(TSP) and PM10 emissions due to increased coal handling for Kiln 2. As

Table 3-3. Net Increase in Emissions Due to the Kiln 2 Coal Conversion Compared to the PSD Significant Emission Rates

Pollutant	Increase in Emissions Due to Kiln 2 Coal Conversion		Significant Emission Rate (TPY)	PSD Review Applies?
	lb/hr	TPY		
Particulate Matter (TSP)	--	12.0	25	No
Particulate Matter (PM10)	--	5.4	15	No
Sulfur Dioxide	354.7	1,553	40	Yes
Nitrogen Dioxide	1.5	6.6	40	No
Carbon Monoxide	0.0	0.0	100	No
Votatile Organic Compounds*	6.9	30.2	40	No*
Lead	0.0	0.0	0.6	No
Sulfuric Acid Mist	10.3	45.1	7	Yes
Beryllium	0.0	0.0	0.0004	No

* Nonattainment pollutant; PSD review does not apply.

shown, potential emissions from the proposed project will exceed the PSD significant emission rate for only SO_2 and sulfuric acid mist. The proposed modification is subject to PSD review for these pollutants.

3.4.1.2 Ambient Monitoring

Based upon the net increase in emissions from the proposed coal conversion, presented in Table 3-3, a PSD preconstruction ambient monitoring analysis is required for SO_2 and sulfuric acid mist. However, if the net increase in impact of a pollutant is less than the de minimis monitoring concentration, then an exemption from the preconstruction ambient monitoring requirement may be granted for that pollutant. In addition, if an acceptable ambient monitoring method for the pollutant has not been established by USEPA, monitoring is not required.

The maximum predicted 24-hour SO_2 impact due to the net increase in SO_2 emissions associated with the Kiln 2 coal conversion is 21 ug/m^3. The methodology used to predict maximum impacts and the impact analysis results are presented in Sections 6.0 and 7.0. This maximum 24-hour impact is above the de minimis monitoring concentration for SO_2 of 13 ug/m^3. There is no acceptable ambient monitoring method for sulfuric acid mist, and therefore monitoring is not required for this pollutant. As a result, the proposed project is subject to preconstruction ambient monitoring analysis for SO_2 only. The air quality analysis for SO_2 is presented in Section 5.0.

3.4.1.3 GEP Stack Height

The GEP stack height regulations allow any stack to be at least 65 meters high. The existing stack for the Kiln 2 is 200 ft in height (61.0 meters) and, therefore, does not exceed the GEP stack height.

3.4.2 Nonattainment Review

Nonattainment review is required for ozone if the net increase in VOC emissions due to the proposed modification exceeds the significant emission rate of 40 TPY. As shown in Table 3-3, the maximum potential increase in VOC emissions due to the project is less than 40 TPY. As a result, nonattainment review for VOC emissions is not required.

4.0 CONTROL TECHNOLOGY EVALUATION

As discussed in the PSD source applicability section (Section 3.4), only SO_2 and sulfuric acid mist emissions require a BACT evaluation. Since sulfuric acid mist emissions are a direct result of sulfur emissions, sulfuric acid mist will be controlled by controlling SO_2. As a result, only SO_2 will be discussed in this section. The BACT evaluation is presented in this section.

Kiln 2 at Tarmac is an existing cement kiln equipped with an ESP for particulate control. The existing kiln already provides SO_2 removal due to the alkaline nature of the kiln dust. The ESP provides some additional SO_2 removal as a result of contact of the flue gases with the kiln dust. A baghouse used for particulate control would inherently provide greater SO_2 removal (in the range of 20 to 45 percent) than the ESP due to the filter cake formed on the bags. However, the use of a baghouse at Tarmac would require complete replacement of the existing ESP, and would be economically prohibitive.

Based upon the sulfur in the coal (2.0 percent sulfur maximum) and the sulfur in the raw feed to the kiln (0.16 percent ~~sulfur~~ SO_3), total potential SO_2 emissions from the kiln are 623.7 lb/hr. To achieve the requested 400 lb/hr SO_2 emission rate, an inherent SO_2 removal efficiency of 36 percent is required. At this level of SO_2 emissions, the flue gases would contain approximately 650 parts per milliion by volume (ppmv) (wet) SO_2. This concentration of SO_2 is approximately equivalent to that concentration in the exhaust gases of a power plant burning 0.9% S coal.

Tarmac's proposed BACT for SO_2 is the inherent control within the kiln/ESP system to achieve an emission rate of 400 lb/hr or less. Based upon experience with Kiln 3 burning coal, regulating conditions within the kiln (i.e., temperature, excess air, etc.) to control SO_2 emissions affects NO_x emissions. After startup of Kiln 2 on coal, Tarmac will conduct performance tests to determine the lowest routinely achievable SO_2 emission rate while at the same time complying with the maximum NO_x emission rate of 169.3 lb/hr (6.77 lb/ton clinker). Based upon this testing, Tarmac is willing to re-evaluate the SO_2 emission limit and accept a lower limit if justified by the test results. Tarmac is fully committed to minimizing SO_2 emissions from the kiln by optimizing kiln operating parameters, while maintaining clinker quality.

There are considered no feasible alternatives to SO_2 control on Kiln 2. Review of the EPA BACT/LAER Clearinghouse documents revealed that no existing or permitted cement kiln employs an add-on SO_2 control system. All cement kilns employ the inherent removal of SO_2 in the kiln and a particulate control device as the SO_2 control method. This is the method proposed by Tarmac, with the commitment to re-evaluating the SO_2 emission limit based upon stack test results.

The proposed BACT for the kiln is the existing kiln/ESP system and operation of the kiln to minimize SO_2 while maintaining compliance with the NO_x on the kiln. This is based upon the consideration of the existing kiln/ESP system and the inherent minimum 36 percent removal efficiency of the existing system, Tarmac's commitment to minimize SO_2 emissions from the kiln, and with the commitment to re-evaluate the SO_2 emission limit for Kiln 2, after test data is obtained.

5.0 AIR QUALITY ANALYSIS

5.1 PROJECT MONITORING APPLICABILITY

As determined by the source applicability analysis described in Section 3.4, an ambient monitoring analysis is required by PSD regulations for SO_2 only. In order to satisfy these requirements, Tarmac proposes to use existing ambient SO_2 data collected by FDER at a site near to the Tarmac facility. The available SO_2 monitoring data are described in Section 5.2.

5.2 AMBIENT SULFUR DIOXIDE DATA

Ambient SO_2 monitoring data from Dade County are available from a FDER operated monitoring station located within 3 km of the Tarmac facility. The monitoring site is located at the intersection of SR 821 (Turnpike Extension) and US 27. Ambient SO_2 data collected at this site for the period 1987 through 1988 are presented in Table 5-1. The monitor actually operated at the site during the period August 1987 through October 1988. The data were collected using a continuous monitor, and since the site is operated by FDER, the data are gathered by required quality assurance procedures for PSD networks.

As indicated in the table, all recorded SO_2 concentrations are low and well below the AAQS. The highest measured 3-hour concentration during the monitoring period was 15 ug/m^3, and the highest measured 24-hour concentration was 8 ug/m^3. These values are well below the AAQS of 1,300 ug/m^3, 3-hour average, and 260 ug/m^3, 24-hour average. The recorded mean SO_2 concentration at the site was 3 ug/m^3. This concentration is well below the AAQS of 60 ug/m^3 for the annual averaging period.

Background SO_2 concentrations for use in the impact analysis are based upon the maximum 3-hour, 24-hour and annual average concentrations measured at the monitoring site. This was assumed since the observed values were low compared to AAQS. The resulting background concentrations are: 15 ug/m^3, 3-hour; 8 ug/m^3, 24-hour; and 3 ug/m^3, background levels are considered conservative since they reflect current operation of the Tarmac facility, and the Tarmac facility will be included specifically in the modeling analysis.

Table 5-1. Summary of Ambient Sulfur Dioxide Data, Dade County, 1987-1988

				Sulfur Dixide Concentration ($\mu g/m^3$)				
Site No.	Site Name	Time Period	No. Obs.	Max. 3-hr	2nd Max. 3-hr	Max. 24-hr	2nd Max. 24-hr	Arithmetic Mean
0860-019	Miami-- US 27 & SR 821	1987*	3,049	9	8	4	4	3
		1988+	6,605	15	13	8	5	3
Federal Primary AAQS				-	-	-	365	80
Federal Secondary AAQS				-	1,300	-	-	-
Florida AAQS				-	1,300	-	260	60

* Data cover period Aug - Dec 1987.
\+ Data cover period Jan - Oct 1988.

6.0 AIR QUALITY MODELING APPROACH

6.1 GENERAL MODELING APPROACH

The general modeling approach followed USEPA and FDER modeling guidelines for determining compliance with AAQS and PSD increments. In general, when model predictions are used to determine compliance with AAQS and PSD increments, current policies stipulate that the highest annual average and highest, second-highest short-term (i.e., 24 hours or less) concentrations be compared to the applicable standard when 5 years of meteorological data are used. The highest, second-highest concentration (HSH) is calculated for a receptor field by:

1. Eliminating the highest concentration predicted at each receptor,
2. Identifying the second-highest concentration at each receptor, and
3. Selecting the highest concentration among these second-highest concentrations.

This approach is consistent with the air quality standards, which permit a short-term average concentration to be exceeded once per year at each receptor.

To develop the maximum short-term concentrations for the proposed facility, the general modeling approach was divided into screening and refined phases to reduce the computation time required to perform the modeling analysis. The basic difference between the two phases is the receptor grid used when predicting concentrations, the number of emission points, and the number of meteorological periods evaluated. In general, concentrations for the screening phase were predicted using a coarse receptor grid, limited number of major sources, and a 5-year meteorological record.

After a final list of HSH short-term concentrations was developed, the refined phase of the analysis was conducted by predicting concentrations for a refined receptor grid centered on the receptor at which the HSH concentration was produced from the screening phase. The air dispersion model was executed for the meteorological periods during which both the highest and second-highest concentrations were predicted to occur at that receptor, based on the screening phase results. This approach was used to ensure that valid HSH concentrations were obtained. More detailed descriptions of the emission inventory and receptor grids used in the screening and refined phases of the analysis are presented in the following sections.

6.2 MODEL SELECTION

The selection of an appropriate air dispersion model was based on the model's ability to simulate impacts in areas surrounding the Tarmac facility. Within 50.0 km of the facility, the terrain can be described as simple, i.e., flat to gently rolling. As defined in the USEPA modeling guidelines, simple terrain is considered to be an area where the terrain features are all lower in elevation than the top of the stack(s) under evaluation. Therefore, a simple terrain model was selected to predict maximum ground-level concentrations.

The Industrial Source Complex (ISC) dispersion model (USEPA, 1988a) was used to evaluate the pollutant emissions from the Tarmac facility and other existing major facilities. This model is contained in USEPA's User's Network for Applied Modeling of Air Pollution (UNAMAP), Version 6 (USEPA, 1988b). The ISC model is applicable to sources located in either flat or rolling terrain where terrain heights do not exceed stack heights.

The ISC model consists of two sets of computer codes which are used to calculate short- and long-term ground level concentrations. The main differences between the two codes are the input format of the meteorological data and the method of estimating the plume's horizontal dispersion.

The first model code, the ISCST model, is designed to calculate hourly concentrations based on hourly meteorological parameters (i.e., wind direction, wind speed, atmospheric stability, ambient temperature, and mixing heights). The hourly concentrations are processed into non-overlapping, short-term and annual averaging periods. For example, a 24-hour average concentration is based on 24 1-hour averages calculated from midnight to midnight of each day. For each short-term averaging period selected, the highest and second-highest average concentrations are calculated for each receptor. As an option, a table of the 50 highest concentrations over the entire field of receptors can be produced.

The second model code within the ISC model is the ISC long-term (ISCLT) model. The ISCLT model uses joint frequencies of wind direction, wind speed, and atmospheric stability to calculate seasonal and/or annual average ground-level concentrations. Because the input wind directions are for 16 sectors, with each sector defined as 22.5 degrees, the model calculates concentrations by assuming that the pollutant is uniformly distributed in the horizontal plane within a 22.5 degree sector.

In this analysis, the ISCST model was used to calculate both short-term and annual average concentrations because these concentrations are readily obtainable from the model output. In general, the ISCST model will produce higher annual average concentrations as compared to the ISCLT model.

Major features of the ISCST model are presented in Table 6-1. Concentrations due to stack and volume sources are calculated by the ISCST model using the steady-state Gaussian plume equation for a continuous source. The area source equation in the ISCST model is based on the equation for a continuous and finite crosswind line source. The ISC model has rural and urban options which affect the wind speed profile exponent law, dispersion rates, and mixing-height formulations used in calculating ground level concentrations. The criteria used to determine when the rural or urban mode is appropriate are based on land use near the proposed plant's surroundings (Auer, 1978). If the land use is classified as heavy industrial, light-moderate industrial, commercial, or compact residential for more than 50 percent of the area within a 3 km radius circle centered

Table 6-1. Major Features of the ISCST Model

ISCST Model Features
o Polar or Cartesian coordinate systems for receptor locations
o Rural or one of three urban options which affect wind speed profile exponent, dispersion rates, and mixing height calculations
o Plume rise due to momentum and buoyancy as a function of downwind distance for stack emissions (Briggs, 1969, 1971, 1972, and 1975)
o Procedures suggested by Huber and Snyder (1976); Huber (1977); and Schulmann and Hanna (1986) and Schulmann and Scire (1980) for evaluating building wake effects
o Procedures suggested by Briggs (1974) for evaluating stack-tip downwash
o Separation of multiple point sources
o Consideration of the effects of gravitational settling and dry deposition on ambient particulate concentrations
o Capability of simulating point, line, volume and area sources
o Capability to calculate dry deposition
o Variation with height of wind speed (wind speed-profile exponent law)
o Concentration estimates for 1-hour to annual average
o Terrain-adjustment procedures for elevated terrain including a terrain truncation algorithm
o Receptors located above local terrain, i.e., "flagpole" receptors
o Consideration of time-dependent exponential decay of pollutants
o The method of Pasquill (1976) to account for buoyancy-induced dispersion
o A regulatory default option to set various model options and parameters to EPA recommended values (see text for regulatory options used)
o Procedure for calm-wind processing

Source: USEPA, 1988b

on the proposed source, the urban option should be selected. Otherwise, the rural option is more appropriate.

For modeling analyses that will undergo regulatory review, such as PSD permit applications, the following model features are recommended by USEPA (1987a) and are referred to as the regulatory options in the ISCST model:

1. Final plume rise at all receptor locations,
2. Stack-tip downwash,
3. Buoyancy-induced dispersion,
4. Default wind speed profile coefficients for rural or urban option,
5. Default vertical potential temperature gradients,
6. Calm wind processing, and
7. Reducing calculated SO_2 concentrations in urban areas by using a decay half-life of 4 hours (i.e., reduce the SO_2 concentration emitted by 50% for every 4 hours of plume travel time).

In this analysis, the USEPA regulatory options were used to address maximum impacts. Based on a review of the land use around the Tarmac facility, the rural mode was selected based on the degree of residential, industrial, and commercial development within 3 km of the site.

6.3 METEOROLOGICAL DATA

Meteorological data used in the ISCST model to determine air quality impacts consisted of a concurrent 5-year period of hourly surface weather observations and twice-daily upper air soundings from the National Weather Service (NWS) stations at Miami International Airport and West Palm Beach, respectively. The 5-year period of meteorological data was from 1982 through 1986. The NWS station in Miami, located approximately 10 km to the southeast of the Tarmac site, was selected for use in the study because it is the closest primary weather station to the study area with similar surrounding topographical features. This station also has the most readily available and complete database which is representative of the plant site.

The surface observations included wind direction, wind speed, temperature, cloud cover, and cloud ceiling. The wind speed, cloud cover, and cloud ceiling values were used in the ISCST meteorological preprocessor program to determine atmospheric stability using the Turner stability scheme. Based on the temperature measurements at morning and afternoon, mixing heights were calculated with the radiosonde data at West Palm Beach International Airport using the Holzworth approach (1972). The West Palm Beach International Airport is located about 100 km north-northeast of the site. Hourly mixing heights were derived from the morning and afternoon mixing heights using the interpolation method developed by USEPA (Holzworth, 1972). The hourly surface data and mixing heights were used to develop a sequential series of hourly meteorological data (i.e., wind direction, wind speed, temperature, stability, and mixing heights). Because the observed hourly wind directions were randomized within each sector to account for the expected variability in air flow. These calculations were performed by using the USEPA RAMMET meteorological preprocessor program.

6.4 EMISSION INVENTORY

6.4.1 Tarmac Facility

Stack operating parameters and SO_2 emission rates for the kilns at Tarmac are presented in Section 2.0, Table 2-2. For determining PSD increment consumption for SO_2, only Kilns 2 and 3 are increment-consuming sources due to their conversion or proposed conversion to coal. The PSD baseline SO_2 emissions for Kilns 2 and 3 are 45.1 lb/hr and 21.9 lb/hr, respectively, based upon oil burning (emission rates documented in 1980 coal conversion application). Thus, increment-consuming emissions for the two kilns are the post-coal conversion emission rate (400 lb/hr each kiln) minus the baseline emission rate, or 354.9 lb/hr for Kiln 2 and 378.1 lb/hr for Kiln 3.

For Kiln 1, a conservatively estimated gas flow rate of 87,000 acfm was used instead of the higher flow rate shown in Table 2-2. This equates to a stack exit velocity of 1,731 ft/min or 8.79 m/s.

6.4.2 <u>Other Air Emission Sources</u>

SO_2 is the only pollutant required to be addressed in the impact analysis. Therefore, an emission inventory for SO_2 was developed from available databases.

FDER provided KBN with AIR 10 reports and APIS inventories for Broward, Dade, and Palm Beach counties. Using this information, supplemented with data from permits, PSD applications, and previous modeling analyses, the SO_2 emitting facilities within 50 km of the location of the Tarmac site were identified and are presented in the attached tables.

All facilities located within 15 km of the Tarmac site with SO_2 emissions greater than 25 TPY were included in the modeling analysis. Facilities located 15 to 50 km from the proposed units with SO_2 emissions greater than 100 TPY were subject to further screening to determine the potential of significant interaction with the proposed sources. An additional source, North Broward Resource Recovery, was also included in the modeling analysis because it is a PSD increment-consuming source, although this is slightly more than 50 km from the Tarmac facility. A list of facilities considered in the modeling analysis is presented in Table 6-2. UTM coordinates of the Tarmac site are 583.2 km east, 2881.3 km north.

As described above, each facility between 15 and 50 km from the Tarmac site was further screened to determine the probability of source interaction. The recommended screening technique is the "Screening Threshold" method developed by the North Carolina Department of Natural Resources and Community Development, and approved by the USEPA. The method is designed to objectively eliminate from the emission inventory those facilities which are not likely to have significant interaction with the source undergoing evaluation. In general, facilities that should be considered in the modeling analyses are those with emissions greater than Q (in TPY), which is calculated by the following criterion:

Table 6-2. Source Inventory Considered in the Modeling Analysis

APIS Facility Identification Number	Facility	County	UTM Coordinates (km) East	UTM Coordinates (km) North	Relative Location (km) to Tarmac Facility+ X	Relative Location (km) to Tarmac Facility+ Y	Distance From Proposed Site (km)	Direction From Proposed Site (degrees)	Maximum Allowable SO_2 Emissions* (TPY)
50BRO060036	FPL -Port Everglades	Broward	587.4	2885.3	24.5	23.6	34.0	46	76,239
50BRO060037	FPL -Fort Lauderdale	Broward	580.3	2883.3	17.4	21.6	27.7	39	63,964
50DAD130003	FPL -Turkey Point	Dade	567.2	2813.2	4.3	-48.5	48.7	175	36,192
50DAD130004	General Portland	Dade	551.7	2843.4	-11.2	-18.3	21.5	211	10,546
50DAD130348	Metro Dade Resource Recovery	Dade	564.3	2857.4	1.4	-4.3	4.5	162	2,996 T
50BRO06????	South Broward County Resource Recovery	Broward	579.6	2883.3	16.7	21.6	27.3	38	1,318
50BRO06????	North Broward County Resource Recovery	Broward	583.6	2907.6	20.7	45.9	50.4	24	896
50DAD130001	FPL -Cutler	Dade	570.4	2834.9	7.5	-26.8	27.8	164	488
50BRO060015	East Coast Asphalt	Broward	584.9	2902.2	22.0	40.5	46.1	29	230
50DAD130015	Rinker Materials	Dade	558.2	2851.3	-4.7	-10.4	11.4	204	218 A
50BRO062094	Waste Management	Broward	583.2	2908.0	20.3	46.3	50.6	24	187
50DAD130483	General Asphalt Portable Plant	Dade	561.5	2853.2	-1.4	-8.5	8.6	189	103
50DAD130053	Brewer Company of Florida	Dade	551.0	2816.8	-11.9	-44.9	46.5	195	85
50DAD130013	Homestead City Utilities	Dade	552.5	2817.6	-10.4	-44.1	45.3	193	77
50BRO060046	Weekly Asphalt Paving	Broward	576.9	2886.1	14.0	24.4	28.1	30	39

* Maximum facility emissions are based on emissions found in APIS, or specific operation permits and PSD application.

+ The Tarmac facility is located at UTM coordinates of 583.2 km east and 2881.3 km north.

Note: T = Emission rate based on Emission Testing emission information, because no information was available on allowable emissions.

A = Emission rate based on ACTUAL emission information, because no information was available on allowable emissions.

$$Q = 20 \times D$$

where D is the distance (km) from the particular source to the source undergoing evaluation.

A listing of the SO_2 facilities in the inventory with associated maximum allowable emissions, distance from the proposed site, and associated Q is presented in Table 6-3. Those facilities with maximum allowable emissions which are below the calculated "screening threshold" were eliminated from further consideration in the modeling analysis. The remaining facilities, along with all facilities greater than 25 TPY emissions and located within 15 km of the Tarmac site, comprise the facility list to be used in the modeling.

Two different source inventories for the FPL-Fort Lauderdale facility were considered for the PSD increment consumption modeling analysis. The first source inventory did not include the proposed FPL Combined Cycle Units and the subsequent retirement of Units 4 and 5. The second source inventory included the increment consumption of the proposed Combined Cycle Units and the increment expansion due to the retirement of Units 4 and 5. The PSD modeling analysis was conducted in this manner to demonstrate the impacts, if the proposed FPL Combined Cycle Units are permitted as planned. Impacts with and without contributions from the FPL-Fort Lauderdale facility will be presented in Section 7.0.

A summary of the SO_2 sources used in the modeling is presented in Table 6-4. PSD increment-affecting sources are noted and were used in the PSD analysis.

6.5 RECEPTOR LOCATIONS

As discussed in Section 6.1, the general modeling approach considered screening and refined phases to address compliance with maximum allowable PSD Class I and Class II increments and AAQS. In the ISCST modeling,

Table 6-3. Summary of SO2 Facilities Considered in the Modeling Analysis Using the "Screening Threshold" Tachnique

APIS Facility Identification Number	Facility	Distance From Proposed Site (km)	Direction From Proposed Site (degrees)	Maximum SO2 * Emissions (TPY)	Q, Emission Threshold (TPY) (20 x Distance)	Included in Modeling
50BR0060036	FPL - Port Everglades	34.0	46	76,238	680	YES
50BR0060037	FPL -Fort Lauderdale	27.7	39	65,864	555	YES
50DAD130003	FPL -Turkey Point	48.7	175	36,192	974	YES
50DAD130004	General Portland	21.5	211	10,546	429	YES
50DAD130348	Metro Dade Resource Recovery	4.5	162	2,996	90	YES
50BRO06????	South Broward County Res. Rec.	27.3	38	1,318	546	YES
50BRO06????	North Broward County Res. Rec.	50.4	24	896	1,007	YES
50DAD130001	FPL -Cutler	27.8	164	488	557	NO
50BRO060015	East Coast Asphalt	46.1	29	230	922	NO
50DAD130015	Rinker Mat	11.4	204	218	228	YES
50BRO062094	Waste Management	50.6	24	187	1,011	NO
50DAD130483	General Asphalt Portable Plant	8.6	189	103	172	YES
50DAD130053	Brewer Company of Florida	46.5	195	85	929	NO
50DAD130013	Homestead City Utilities	45.3	193	77	906	NO
50BRO060046	Weekly Asphalt Paving	28.1	30	39	563	NO

* Maximum facility emissions determined from APIS or other available information on facility.

Note: All facilities within 15 km of Tarmac with SO_2 emissions greater than 25 TPY were modeled.

Table 6-4. Summary of SO_2 Emission Sources To Be Used in the Modeling Analysis

APIS Facility Number	Facility	Coordinates Relative To Proposed Unit (km) X	Y	Source Description	Stack Data (ft) Height	Diameter	Operating Data Temperature (degrees F)	Velocity (ft/sec)	Modeled Emissions (lb/hr)	Annual Emissions (TPY)	PSD Sources
50BR0060036	FPL - Port Everglades	24.5	23.6	Units 1 and 2	344	14.0	289	68.0	5,060	22,163 *	No
				Units 3 and 4	343	18.1	275	68.0	8,470	37,098 *	No
				Gas Turbines 1-12	51	18.0**	860	70.0	3,876	16,978 *	No
50BR0060037	FPL - Fort Lauderdale	17.4	21.6	Proposed CT/HRSG	150	16.0	280	36.2	3,678	16,109	Yes
				Units 4 and 5	151	14.0	300	57.8	3,630	15,900	No
				Gas Turbines 1-12	51	18.0**	860	70.0	3,876	16,978	No
				Gas Turbines 13-24	44	18.0**	860	70.0	3,876	16,978	No
50AD13003	FPL - Turkey Point	4.3	-48.5	Unit 1 and 2	400	18.1	275	63.0	19,800	36,192	No
50BR006????	South Broward County Resource Revovery	16.7	21.6	Units 1-3	195	7.5	226	59.1	303	1,318	Yes
50BR006????	North Broward County Resource Recovery	20.7	45.9	Units 1-3	200	7.5	226	59.1	281	896	Yes
50DAD130004	General Portland	-11.2	-18.3	Cement Kilns 1 and 2	225	14.8	475	15.0	2,408+	10,546	No
50DAD130348	Metro Dade Resource Recovery	1.4	-4.3	Boilers 1-4	151	9.0	390	40.0	418	1,832	Yes
50DAD130015	Rinker Materials	-4.7	-10.4	Concrete Batch Plant	137	15.0	260	25.0	111	218	No
50DAD130483	General Asphalt	-1.4	-8.5	Concrete Batch Plant	23	3.8	300	76.0	23	103	No

* Annual emissions are based on the assumption of 8,760 hours of operation at the modeled emission rate.
+ Short-term emissions are based on the assumption of 8,760 hours of operation at the annual emission rate.
** Effective diameter based on the rectangular area of the stack.

concentrations were predicted for the screening phase using several receptor grids. The locations of the receptors were based on identifying the areas in which maximum concentrations would be expected due to the proposed units.

A description of the receptor locations for determining compliance with PSD Class II increments and AAQS is as follows:

1. 360 receptors located at distances of 100, 300, 500, 800, 1100, 1,500, 2,000, 2,500, 3,200 and 4,000 m along 36 radials with each radial spaced at 10-degree increments.

2. 24 receptors located along the north and east boundaries of the Everglades National Park for the PSD Class I analysis. The locations of these receptors are presented in Table 6-5.

After the screening modeling was completed to determine impacts for comparison to PSD Class II increments and AAQS, refined short-term modeling was conducted using a receptor grid centered on the receptor which had the highest, second-highest short-term concentrations. The receptors were located at intervals of 100 m between the distances considered in the screening phase along 9 radials, at 2-degree increments, centered on the radial along which the maximum concentration was produced. For example, if the maximum concentration was produced along the 90-degree radial at a distance of 1.75 km, the refined receptor grid would consist of receptors at the following locations:

Directions (degrees)	Distance (km)
82, 84, 86, 88, 90, 92, 94, 96, 98	1.35, 1.45, 1.55, 1.65, 1.75, 1.85, 1.95, 2.05, and 2.15 per direction

To ensure that a valid HSH concentration was calculated, concentrations were predicted for the refined grid for the periods that produced both the highest and HSH concentrations from the screening receptor grid.

Table 6-5. Receptors Used in the PSD Class I Modeling Analysis To Address Predicted Impacts on the Everglades National Park

Receptor No.	UTM Coordinates (km) East	UTM Coordinates (km) North	Relative Position to Proposed Site (km)* East	North	Distance
1	515.0	2848.0	-47.9	-13.7	49.8
2	520.0	2848.0	-42.9	-13.7	45.0
3	525.0	2848.0	-37.9	-13.7	40.3
4	530.0	2848.0	-32.9	-13.7	35.6
5	533.5	2848.0	-29.4	-13.7	32.4
6	533.5	2843.0	-29.4	-18.7	34.8
7	533.5	2838.0	-29.4	-23.7	37.8
8	533.5	2833.0	-29.4	-28.7	41.1
9	533.5	2828.0	-29.4	-33.7	44.7
10	533.5	2823.0	-29.4	-38.7	48.6
11	533.5	2818.0	-29.4	-43.7	52.7
12	533.5	2815.3	-29.4	-46.4	54.9
13	538.0	2815.3	-24.9	-46.4	52.7
14	541.3	2814.0	-21.6	-47.7	52.3
15	542.0	2811.0	-20.9	-50.7	54.8
16	543.0	2810.0	-19.9	-51.7	55.4
17	543.0	2805.0	-19.9	-56.7	60.0
18	543.0	2800.0	-19.9	-61.7	64.8
19	543.0	2796.5	-19.9	-65.2	68.2
20	548.0	2796.5	-14.9	-65.2	66.9
21	553.0	2796.5	- 9.9	-65.2	65.9
22	556.0	2796.0	- 6.9	-65.7	66.1
23	556.6	2792.0	- 6.3	-69.7	70.0
24	557.0	2789.0	- 5.9	-72.7	72.9

* The UTM coordinates of the Tarmac facility are 562.9 km east and 2861.7 north.

6.6 BACKGROUND CONCENTRATIONS

Background concentrations used in the air quality impact analysis are discussed in Section 5.0. The SO_2 background concentrations used in the AAQS analysis were 15 $\mu g/m^3$, 8 $\mu g/m^3$ and 3 $\mu g/m^3$ for averaging times of 3-hour, 24-hour, and annual, respectively.

6.7 BUILDING DOWNWASH EFFECTS

Based on the building dimensions associated with buildings or structures at the Tarmac facility, stacks for Kilns 1, 2, and 3 are within 10% of GEP based on the K3/K4 ESP. In addition, the K3/K4 ESP is not a solid structure, being open at the bottom and allowing air flow under the ESPs. Therefore, no potential building downwash or wake effects were considered in the modeling analysis due to this structure.

The K1 and K2 stacks are marginally within the area of influence of the Finish Mill Building, and the stacks are near the GEP height for this building of 265 feet. Therefore downwash due to this structure will not be significant. The K3 stack is not in the influence of the Finish Mill Building or any other buildings other than the K3/K4 ESP.

Building downwash was simulated for the FPL-Fort Lauderdale facility. The parameters used for model simulation of downwash can be found in the model printouts.

7.0 AIR QUALITY MODELING RESULTS

7.1 KILN 2 ONLY

A summary of the maximum predicted SO_2 impacts due to Kiln 2 only burning coal, based on the screening analysis, is presented in Table 7-1. The results reflected the proposed SO_2 emissions of 400 lb/hr. The maximum predicted 3-hour, 24-hour and annual SO_2 concentrations are 90, 24 and 3.4 $\mu g/m^3$, respectively. These maximum impacts are all above the significance levels established by USEPA and FDER, and therefore further modeling analysis is required for SO_2 to demonstrate compliance with PSD increments and AAQS.

The maximum predicted impacts due to the increase in SO_2 emissions due to Kiln 2 Coal Conversion can be obtained by ratioing the above results. The increase in SO_2 emissions, from Table 2-1, is 354.7 lb/hr. The maximum impacts due to this increase are as follows: 80 $\mu g/m^3$, 3-hour; 21 $\mu g/m^3$, 24-hour; and 3.1 $\mu g/m^3$, annual average.

7.2 PSD CLASS II INCREMENT ANALYSIS

Maximum SO_2 concentrations predicted from the screening analysis for comparison to the PSD Class II increments are presented in Table 7-2. The results reflect impacts due to all increment consuming sources, which include Kiln 2 and Kiln 3 at Tarmac. The maximum PSD increment consumption values were well below the allowable increments. The 24-hour increment consumption was predicted from the screening analysis to be about 30 percent of the allowable increment, and therefore this impact was further refined (1985, Day 244 and 32). A summary of the maximum SO_2 PSD Class II increment consumption concentrations predicted in the analysis are presented in Table 7-3.

The maximum 3-hour average SO_2 PSD Class II increment consumption due to all increment consuming sources is predicted to be 103 $\mu g/m^3$, which is

Table 7-1. Maximum Predicted SO_2 Concentrations from the Screening Analysis Due to Kiln 2 Only

Averaging Period	Maximum Concentration (ug/m^3)	Receptor Location+ Direction (°)	Receptor Location+ Distance (km)	Period Julian Day	Period Hour Ending	Period Year
3-Hour*	89	330	0.800	239	12	1982
	90	340	1.100	149	15	1983
	84	300	0.800	245	15	1984
	78	250	0.800	148	15	1985
	74	10	1.100	70	12	1986
24-Hour*	20	320	1.500	201	-	1982
	24	280	1.500	185	-	1983
	22	310	1.100	122	-	1984
	20	290	2.000	237	-	1985
	19	330	1.500	48	-	1986
Annual	3.3	320	1.500	-	-	1982
	3.4	300	1.100	-	-	1983
	2.9	300	1.500	-	-	1984
	2.1	230	1.500	-	-	1985
	2.3	270	2.000	-	-	1986

\+ Relative to the location of the Kiln 2.
* Highest, second-highest concentrations predicted for this averaging period.

Table 7-2. Maximum Predicted SO_2 Concentrations from the Screening Analysis for Comparison to PSD Class II Increments

Averaging Period	Maximum Concentration (ug/m^3)	Receptor Location+ Direction (°)	Receptor Location+ Distance (km)	Period Julian Day	Period Hour Ending	Period Year
3-Hour*	97	330	0.800	204	12	1982
	103	300	0.800	200	12	1983
	94	330	0.800	182	12	1984
	83	250	0.800	148	15	1985
	81	340	1.500	48	12	1986
24-Hour*	23.5	320	1.500	177	-	1982
	25.7	280	1.500	212	-	1983
	23.6	310	1.100	122	-	1984
	26.1	340	2.000	244	-	1985
	23.1	330	1.500	169	-	1986
Annual	4.5	320	1.500	-	-	1982
	4.6	300	1.500	-	-	1983
	3.9	300	1.500	-	-	1984
	3.3	280	2.000	-	-	1985
	3.6	270	2.000	-	-	1986

\+ Relative to the location of the Kiln 2.

* Highest, second-highest concentrations predicted for this averaging period.

Note: 3-and 24-hour average concentrations remain unchanged if the impacts of the proposed combined cycle units and Units 4 and 5 at FPL Fort Lauderdale are not considered in the modeling analysis. Annual concentrations are reduced by 0.1 ug/m^3 if impacts from these sources are not considered.

Table 7-3. Maximum Predicted SO_2 Concentrations for Comparison to PSD Class II Increments

Averaging Period	Maximum Concentration (ug/m^3)	Receptor Location+ Direction (°)	Receptor Location+ Distance (km)	Period Julian Day	Period Hour Ending	Period Year	PSD Class II Increment
SO_2 Concentrations							
3-Hour*	103	300	0.800	204	12	1982	512
24-Hour*	26.3	338	1.900	244	--	1985	91
Annual	4.6	300	1.500	--	--	1983	20

\+ Relative to the location of the Kiln 2.
* Highest, second-highest concentrations predicted for this averaging period.

20 percent of the maximum allowable PSD Class II increment of 512 $\mu g/m^3$, not to be exceeded more than once per year.

The maximum 24-hour average SO_2 PSD Class II increment consumption due to all sources is predicted to be 26.3 ug/m^3, which is 29 percent of the maximum allowable PSD Class II increment of 91 ug/m^3, not to be exceeded more than once per year.

The maximum annual average SO_2 PSD Class II increment consumption is predicted to be 4.6 $\mu g/m^3$, which is 23 percent of the maximum allowable PSD Class II increment of 20 $\mu g/m^3$.

Based upon these results, operation of Kiln 2 on coal, in conjunction with all other PSD increment consuming sources, will consume less than 30 percent of the allowable Class II increments. Thus, there is increment available for significant future growth in the area. As discussed in Section 6.0, the PSD Class II analysis was conducted both with and without the planned FPL Lauderdale Repowering Project. Maximum increment consumption values near Tarmac did not change as a result of the planned FPL facility. This indicates that other nearby sources (i.e., Tarmac and Dade County Resource Recovery) are the primary contributors to the Class II increment consumption values.

7.3 AAQS ANALYSIS

The maximum 3-hour, 24-hour, and annual average total SO_2 concentrations predicted from the screening analysis are presented in Table 7-4. The total concentrations were determined from the impacts of the modeled sources added to the background concentration determined from monitoring data. These results show that the maximum SO_2 concentrations due to all sources are well below the AAQS for all averaging periods.

Table 7-4. Maximum Predicted Total SO_2 Concentrations from the Screening Analysis for Comparison to AAQS

	Concentration (ug/m^3)							
		Total Due To		Receptor Location++		Period		
Averaging Period	Total	Modeled Sources	Background	Direction (°)	Distance (km)	Julian Day	Hour Ending	Year
3-hour	239	224	15	20	3.2	28	24	1982
	225	210	15	320	4.0	263	24	1983
	244	229	15	330	4.0	74	24	1984
	217	202	15	10	3.2	156	24	1985
	246	231	15	10	4.0	130	21	1986
24-hour*	76	68	8	340	4.0	314	--	1982
	65	57	8	320	4.0	303	--	1983
	72	64	8	330	4.0	269	--	1984
	67	59	8	10	4.0	337	--	1985
	60	52	8	230	3.2	155	--	1986
Annual	13	10	3	320	1.5	--	--	1982
	12	9	3	300	1.5	--	--	1983
	12	9	3	300	1.5	--	--	1984
	12	9	3	320	4.0	--	--	1985
	12	9	3	270	3.2	--	--	1986

* Highest, second-highest concentrations predicted for this averaging period.
++ Relative to the location of Kiln 2.

Note: AAQS are 1,300 ug/m^3, 3-hour
260 ug/m^3, 24-hour
60 ug/m^3, annual

Based upon the low predicted values, no refinements of these concentrations were performed. Review of the model printouts indicated fairly uniform concentrations across the receptor grid, indicating a distant source is causing the maximum impacts.

The maximum 3-hour average SO_2 concentration due to all sources is predicted to be 246 $\mu g/m^3$, which is 19 percent of the Florida AAQS of 1300 $\mu g/m^3$, not to be exceeded more than once per year. The maximum 24-hour average SO_2 concentration due to all sources is predicted to be 76 $\mu g/m^3$, which is 29 percent of the Florida AAQS of 260 $\mu g/m^3$, not to be exceeded more than once per year. The maximum annual average SO_2 concentration due to all sources is predicted to be 13 $\mu g/m^3$, which is 22 percent of the Florida AAQS of 60 $\mu g/m^3$.

The Dade County Department of Environmental Resources Management, Environmental Planning Division has developed the following AAQS for SO_2 that must not be exceeded in any part of Dade County:

3-Hour Average	-	350 $\mu g/m^3$
24-Hour Average	-	110 $\mu g/m^3$
Annual Average	-	25 $\mu g/m^3$

The 3- and 24-hour average AAQS may be exceeded once per year. As shown in Table 7-4, none of the predicted concentrations exceed the Dade County AAQS.

7.4 CLASS I AREA ANALYSIS

The results of the PSD Class I area modeling analysis for the Everglades National Park are presented in Table 7-5. The modeling analysis evaluated a number of receptors along the boundary of the Class I area.

Table 7-5. Maximum Predicted SO_2 Concentrations for Comparison to PSD Class I Increments

Averaging Period	Maximum Concentration (ug/m^3)	Period: Julian Day	Period: Hour Ending	Period: Year	PSD Class I Increment
3-Hour*	15	317	12	1982	25
	16	266	9	1983	
	16	56	12	1984	
	19	150	9	1985	
	12	257	24	1986	
24-Hour*	3.9	291	--	1982	5
	4.5	303	--	19 ~~18~~83	
	3.9	268	--	1984	
	3.7	256	--	1985	
	4.1	124	--	1986	
Annual	0.56	--	--	1982	2
	0.53	--	--	1983	
	0.52	--	--	1984	
	0.49	--	--	1985	
	0.54	--	--	1986	

* Highest, second-highest concentrations predicted for this averaging period.

As shown in Table 7-5, total Class I PSD increment consumption concentrations for SO_2 are below the Class I increments for all averaging times. The maximum 3-hour increment consumption is predicted to be 19 $\mu g/m^3$, compared to the Class I increment of 25 $\mu g/m^3$. The maximum predicted 24-hour increment consumption for SO_2 is 4.5 $\mu g/m^3$, which is below the allowable increment of 5 $\mu g/m^3$. These maximum increment consumption values are due to the effects of two increment consuming sources located in Dade County: Tarmac Florida (cement plant) and Dade County Resource Recovery (MSW incinerator). The proposed Lauderdale Repowering Project does not contribute to these maximum increment consumption values. This value was further refined using a refined receptor grid with 100 m spacing along the boundary of the Class I area. The resulting 24-hour increment consumption was 4.7 $\mu g/m^3$ (1983, Day 303).

The maximum predicted annual SO_2 increment consumption concentration in the Class I area is predicted to be 0.56 $\mu g/m^3$. This value is well below the allowable Class I increment of 2 $\mu g/m^3$ for SO_2.

To demonstrate the effects the proposed Kiln 2 Coal Conversion will have on the Class I area, the modeling analysis evaluated the impacts of Kiln 2 only. The results of this analysis are presented in Table 7-6. As shown, the maximum Class I impacts due to Kiln 2 only are 7.2 $\mu g/m^3$, 3-hour, 1.8 $\mu g/m^3$, 24-hour, and 0.16 $\mu g/m^3$, annual average. These values are less than 40 percent of the Class I increments.

Maximum total SO_2 concentrations predicted in the Class I area due to all sources are presented in Table 7-7. These concentrations include the estimated background concentration for the Tarmac area. As shown, the maximum concentrations are predicted to be: 193 $\mu g/m^3$, 3-hour average; 52 $\mu g/m^3$, 24-hour average; and 9.9 $\mu g/m^3$, annual average. These maximum impacts are 20 percent of the AAQS or less.

Table 7-6. Maximum Predicted SO_2 Concentrations for Comparison to PSD Class I Increments Due to Kiln 2 Only

Averaging Period	Maximum Concentration (ug/m^3)	Period: Julian Day	Period: Hour Ending	Period: Year	PSD Class I Increment
3-Hour*	6.9	206	3	1982	25
	7.2	138	6	1983	
	6.8	260	24	1984	
	6.6	149	3	1985	
	6.2	221	3	1986	
24-Hour*	1.4	292	--	1982	5
	1.8	290	--	19 ~~18~~83	
	1.4	78	--	1984	
	1.2	343	--	1985	
	1.2	295	--	1986	
Annual	0.16	--	--	1982	2
	0.14	--	--	1983	
	0.15	--	--	1984	
	0.13	--	--	1985	
	0.15	--	--	1986	

* Highest, second-highest concentrations predicted for this averaging period.

Table 7-7. Maximum Total Predicted SO_2 Concentrations for the Everglades NP Class I Area

Averaging Period	Concentration (ug/m³)			Year	AAQS
		Total due to			
	Total	Modeled Sources	Background		
3-Hour*	159	144	15	1982	1,300
	193	178	15	1983	
	181	166	15	1984	
	167	152	15	1985	
	163	148	15	1986	
24-Hour*	48	40	8	1982	260
	50	42	8	1983	
	50	42	8	1984	
	52	44	8	1985	
	44	36	8	1986	
Annual	9.9	6.9	3	1982	60
	9.2	6.2	3	1983	
	9.9	6.9	3	1984	
	9.0	6.0	3	1985	
	9.1	6.1	3	1986	

8.0 IMPACTS TO AIR QUALITY RELATED VALUES, VEGETATION, SOILS AND VISIBILITY

8.1 AIR QUALITY RELATED VALUES

The impacts of the proposed Kiln 2 coal conversion on Air Quality Related Values (AQRV), in the Everglades National Park are addressed in this section. The AQRVs are defined under PSD regulations as being: "All those values possessed by an area except those that are not affected by changes in air quality and include all those assets of an area whose vitality, significance, or integrity is dependent in some way upon the air environment. These values include visibility and those scenic, cultural, biological, and recreational resources of an area that are affected by air quality. Important attributes of an area are those values or assets that make an area significant as a monument, preserve, or primitive area. They are the assets that are to be preserved if the area is to achieve the purposes for which it was set aside" (Federal Register, 1978).

Freshwater and coastal wetlands, dominant plant communities, unique and rare plant communities, soils and associated periphyton, and the wildlife dependent upon these communities for habitat are considered part of the AQRVs. Rare, endemic, threatened, and endangered species of the national park and bioindicators of air pollution (e.g., lichens) are also AQRVs and are evaluated in this section.

8.1.1 General Description

The Everglades National Park is a subtropical preserve located on the southern tip of Florida. The park comprises about 715,000 acres including an estimated 330,000 acres of mangrove and saltmarsh, 366,000 acres of prairie, and 20,000 acres of pineland (Taylor and Herndon, 1981). Small islands of tropical hardwood hammock, evergreen temperate swamp ("bayheads") and cypress swamp are present and are interspersed among the larger vegetation communities.

Most of the coastline is occupied by mangroves. Species present include red mangrove (Rhizophora mangle), black mangrove (Avicennia germinans), and white mangrove (Laguncularia racemosa).

Prairies which are seasonally inundated are the largest vegetation communities in the national park. These wetlands are dominated by sawgrass (Cladium jamaicense), muhlygrass (Muhlenbergia filipes), and/or little bluestem (Schizachyrium rhizomatum). Muhlygrass dominates the drier prairies; sawgrass occurs where the hydroperiod is longer than 5-months. Algal periphyton mats are usually present in these prairies. The predominant soil in the prairies is Marl. Marl is a calcareous substance precipitated by the blue-green algae of the periphyton mats. The algae comprising the periphyton are important primary producers and are dependent upon calcium-rich waters (Gleason and Spackman, 1973). Sawgrass sometimes occurs on pockets of peat within the marl-limestone substrate.

Pinelands occur on limestone (Miami oolite),and have many crevices and solution holes but very little soil development (Loope, et al., 1979). South Florida slash pine (Pinus elliottii var. densa) is the single canopy tree in this vegetation type. The understory, which is diverse, includes tropical hardwoods and herbaceous species endemic to South Florida. Pinelands were once the dominant upland community in South Florida, but very little of this community type remains outside of the national park boundaries.

Hardwood hammocks in the park range up to a few acres in size and number in the thousands. They occur on small areas of ground higher than the surrounding prairie. Dominant species include gumbo-limbo (Bursera simaruba), poisonwood (Metopium toxiferum), buckthorn (Bumelia salicifolia), strangler fig (Ficus aurea), and pigeon-plum (Coccoloba diversifolia). Other important trees and shrubs include myrsine (Myrsine floridana), wild tamarind (Lysiloma latisiliquum), white stopper (Eugenia axillaris), wild coffee (Psychotria nervosa), and marlberry (Ardisia escallonioides). The hardwood hammocks contain numerous tropical plant species not found anywhere else in the United States (Loope and Urban, 1980). Epiphytic orchids and bromeliads are frequent. The hammocks grow on eroded limestone which is covered with a shallow layer of organic soil (Olmsted, _et al_., 1980).

Temperate swamp hardwoods are found in the areas which are inundated seasonally. These areas are dominated by redbay (_Persea borbonia_), wax myrtle (_Myrica cerifera_), sweetbay (_Magnolia virigniana_), and dahoon (_Ilex cassine_). Pond apple (_Annona glabra_), cocoplum _Chrysobalanus icaco_), and buttonbush (_Caphalanthus occidentalis_) are in the shrub layer. Ferns are common in the ground layer. Epiphytes include _Tillandsia_ spp. and _Encyclia tampensis_. Peat forms the substrate which varies in depth from 30 to 200 cm over limestone.

Two types of cyprss, bald cypress (_Taxodium distichum_) and pond cypress (_Taxodium ascendens_), occur in the national park. The understory of cypress-dominated communities is typically open and contains many of the same species that are present in the temperate swamp hardwood communities. Ferns usually dominate the groundlayer. Epiphytic vascular plants and lichens are abundant. Again, in these areas peat or peaty marls form the substrate.

Lichens are abundant on the bark of hardwood trees and cypress hammocks, as well as on ornamental trees planted at visitor centers within the park. Lichens are important for their intrinsic functions in the park ecosystem and for their use as bioindicators based on their sensitivity to air pollution. They provide a germination substrate for vascular epiphytes, and serve as food for invertebrates. Some species fix nitrogen. Because lichens are sensitive to air pollution, potential impacts of air pollution on the national park vegetation can be evaluated by comparing predicted pollutant levels in the park to the threshold levels of pollutants known to be injurious to lichens. If projected pollutant levels are below amounts known to adversely impact lichens, then less sensitive vascular plants are very unlikely to be affected.

Vascular epiphytes, many of them threatened or endangered species, are common in tree hammocks. Most of these are orchids (Epidendrum spp., Oncidium spp.) and bromeliads (Catopsis beteroniana, Catopsis nutans, Tillandsia balbisiana eg.). These plants obtain water and essential elements from precipitation and much of their surface area is exposed to airborne contaminants. Therefore, vascular epiphytes may potentially be sensitive to air pollutants.

No plant species in the park are listed by the U.S. Fish and Wildlife Service as threatened or endangered. However, certain species that are either under review for listing by the Fish and Wildlife Service or protected by the State of Florida under the Preservation of Native Flora of Florida Act (Table 8-1) could be present in the park.

Major soil associations found within the national park and their characteristics are summarized in Table 8-2. The soils consist primarily of histosols and shallow entisols over limestone substrate.

Threatened and endangered wildlife species found in the national park are listed in Table 8-3. The primary habitats for each of these species are shown in Table 8-4.

8.1.2 Impacts to Vegetation

One essential plant nutrient is sulfur. Sulfur is usually taken up as sulfate ions from the soil solution through the roots. When sulfur dioxide in the atmosphere enters the foliage through pores in the leaves, it reacts with water in the leaf interior to form sulfite ions. Sulfite ions are highly toxic. They interact with enzymes, compete with normal metabolites, and interfere with a variety of cellular functions (Horsman and Wellburn, 1976). However, sulfite is oxidized to sulfate ions within the leaf, which can then be used by the plant as a nutrient. Small amounts of sulfite may be oxidized before they become toxic to the plant.

Table 8-1. Rare Plants Found to Occur in South Florida Area

SCIENTIFIC NAME	COMMON NAME	USFWS STATUS	FDA STATUS
SPECIAL PLANT			
Asclepias curtissii	Curtiss' milkweed		T
Conradina grandiflora	large-flowered rosemary	UR2	
Ernodea littoralis	beach-creeper		T
Jacquemontia reclinata	beach jacquemontia	UR2	E
Lechea cernua	nodding pinweed	UR2	
Myrcianthes fragrans var simponii	twinberry	UR2	
Okenia hypogaea	burrowing four-o'clock		E
Coccothrinax argentata	silver palm		C
Digitaria gracillima	longleaf crabgrass	UR2	
Epidendrum nocturnum	night-scented orchid		T
Hymenocallis latifolia	broad-leaved spiderlily	UR5	
Remirea maritima	beach-star		E
Tillandsia flexuosa	banded wild-pine		T
Acrostichum aureum	golden leather fern		E
Asplenium dentatum	slender spleenwort		T
Asplenium serratum	bird's nest spleenwort		E
Ophioglossum palmatum	hand fern	UR5	E

Source: Wood, 1988

Table 8-2. Summary of Characteristics of Major Soil Associations Found Within Everglades National Park

Soil Type/Association	Characteristics
Broward-Parkwood-Keri Association	Derived from moderately thin beds of sand over marl or relatively hard limestone. Parkwood soils are underlain by soft marl at somewhat deeper depths; the Keri series is typically comprised of layers of sand and marl within 100 cm from the surface.
Perrine-Ochopee Association	The Perrine series are poorly drained from recent unconsolidated, finely divided calcareous sediments and are generally associated with tidal swamps and marshes. Depth to underlying limestone is 20 to 91 cm. The Ochopee soils are poorly drained and originated from calcareous sands and marl.
Everglades-Brighton-Pamlico Association	Highly organic muck or peat soils formed from decomposition of emergent vegetation that overlie nearly neutral or alkaline sands and sandy clays. Underlain by marl or limestone. Everglades soils are slightly acid to alkaline; Brighton and Pamlico soils tend to be more acidic.
Tidal Marsh-Coastal Beach-Coastal Dunes	Restricted to the periphery of the coast and consists of nearly level salt marshes, coastal beach, and coastal dunes. Tidal exchange and sea salt deposition dominate the ionic balance and pH regime of these systems.
Rockland	Porous limestone through which water flows freely.

Source: Smith, et al., 1973.

Table 8-3. Federal and State Listed Endangered and Threatened Animals in the Everglades National Park

Animals	State	Federal
Mammals		
Florida Panther	End.	End.
Mangrove Fox Squirrel	End.	-
Florida Black Bear	Thr.	-
Everglades Mink	Thr.	-
Manatee	Thr.	End.
Birds		
Wood Stork	End.	-
Everglade Kite	End.	End.
Cape Sable Seaside Sparrow	End.	End.
Peregrine Falcon	End.	End.
Southern Bald Eagle	Thr.	End.
Osprey	Thr.	-
Florida Sandhill Crane	Thr.	-
Brown Pelican	Thr.	End.
Great White Heron	Thr.	-
Southeastern American Kestrel	Thr.	-
Reptiles		
American Crocodile	End.	End.
American Alligator	Thr.	Thr.
Eastern Indigo Snake	Thr.	Thr.

End. = endangered; Thr. = threatened

Table 8-4. Habitat of Federal and State Listed Endangered and Threatened Animals in the Everglades National Park

	HABITAT							
Species	Pine Forest	Tropical Hardwood Forest	Cypress Forest	Evergreen Swamp Forest	Inland Marshes, Ponds, Sloughs	Wet Prairies	Mangrove Forest	Coastal Marshes
<u>Mammals</u>								
Florida Panther	X	X	X	X		X	X	X
Mangrove Fox Squirrel	X	X	X	X		X		
Florida Black Bear	X	X	X	X		X	X	X
Everglades Mink			X	X	X	X		
Manatee							X	
<u>Birds</u>								
Wood Stork			X	X	X	X	X	X
Everglade Kite					X	X		
Cape Sable Seaside Sparrow					X	X		X
Peregrine Falcon	X				X	X	X	X
Southern Bald Eagle	X		X		X		X	X
Osprey	X		X			X	X	X
Florida Sandhill Crane					X	X		X
Brown Pelican							X	X
Great White Heron				X			X	X
Southeastern American Kestrel	X				X	X		
<u>Reptiles</u>								
American Crocodile							X	
American Alligator			X	X	X	X	X	
Eastern Indigo Snake	X	X	X			X	X	

Source: Duever, et al., 1979.

If a plant is subject to long-term exposure to sulfur dioxide, sulfate may accumulate in the leaves because more sulfate is produced than can be utilized by the plant. Reduced yield and other impacts on growth and vigor may result from these chronic, long-term exposures. Frequency of exposure is important. Low doses of sulfur dioxide, followed by long periods of very low or no exposure, may be less damaging than the same total dose received continuously. This is because plants can utilize the accumulated sulfate during the period of no exposure.

Plant species vary widely with regard to the threshold level of pollutants which cause injury or growth reduction. Plant response to sulfur dioxide emissions from the proposed facility will depend upon the concentration of the gas, the duration of each exposure, and the frequency of exposures. Near the Tarmac facility (i.e., within 4 km), the pattern of exposure will consist of a few episodes of relatively high concentration for a short duration interspersed with long periods of extremely low concentrations. At longer distances from the facility, such as within the Class I area, concentrations are generally low for long periods of time.

The maximum predicted 3-hour average SO_2 concentration in the Class I area due to all sources is 193 ug/m^3, (see Table 7-8). The total maximum predicted 24-hour average concentration is 52 ug/m^3, and the annual average concentration is 9.9 ug/m^3. Concentrations which are at or near the maximum levels will occur infrequently during the year and will occur at the eastern border of the national park. Maximum concentrations will decrease with distance to the west of the eastern boundary, since emissions sources lie to the east of the park.

The maximum contribution of Kiln 2 to concentrations in the Class I area are 7.2 ug/m^3, 3-hour, 1.8 ug/m^3, 24-hour, and 0.16 ug/m^3 annual average. These maximum contributions are less than 1 percent of the AAQS for SO_2.

Exposures to SO_2 that have been shown by laboratory tests or field observations to adversely affect plant species that occur, or are similar to those that occur, in the national park are presented in Table 8-5. The most sensitive species are two lichen species that are common in the park, but less abundant in urban areas east of the national park (Ramalina denticulata and Parmotrema tinctorum). Exposures that affect these lichens are much higher than the concentrations and frequencies of SO_2 that will result from the proposed Kiln 2 Coal Conversion. Therefore, no adverse impact to vegetative resources in the national park is expected to result from the coal conversion.

In conclusion, the predicted concentrations of sulfur dioxide resulting from the proposed coal conversion will have no impact on the vegetation of the national park.

8.1.3 Impacts to Soils

Potential and hypothesized effects of atmospheric deposition on soils include: increased soil acidification; alteration in cation exchange; loss of base cations; and mobilization of trace metals. The potential sensitivity of specific soils to atmospheric inputs is related to two factors. First, the physical ability of a soil to conduct water vertically through the soil profile is important. Second, the ability of the soil to resist chemical changes, as measured in terms of pH and soil cation exchange capacity (CEC), is important in determining how a soil responds to atmospheric inputs.

The soils of the national park are generally classified as histosols or entisols. Histosols (or peat soils) are organic and have extremely high buffering capacities based on CEC, base saturation, and bulk density. Therefore, they will be relatively insensitive to atmospheric inputs. The entisols are shallow sandy soils overlying limestone, such as the soils found in the pinelands. The direct connection of these soils with subsurface limestone tends to neutralize any acidic inputs. In addition, the groundwater table is highly buffered due to the interaction with subsurface limestone formations, which results in high alkalinity (as Calcium Carbonate).

Table 8-5. Lowest Doses of SO_2 Reported to Affect Plant Species Common to Site Region

Species	Lowest SO_2 Concentration (ug/m^3) Known to Affect Species	Reference
Parmotrema tinctorum	200, for 6 hours/week for 10 weeks. Increased percent electrolyte leakage. (240, for 3 hours/week for 6 weeks showed no effect on leakage, biomass gain, or photosynthetic rate.	Hart et al., 1988
Ramalina denticulata	400, for 6 hours/week for 10 weeks. Reduced biomass gain, lowered photosyntheitic rate, and increased percent electrolyte leakage in comparison to effects of lower SO_2 concentrations	Hart et al., 1988
Taxodium distichum (bald cypress)	1300, for 48 hours did not affect dry weight gain	Shanklin and Kozlowski; 1985
Pinus elliottii (slash pine)	650, for 2 hours - Reduced needle growth	Berry 1974
Lycopersicon (tomato) escoulentum	1258, for 5 hours on each of 57 days reduced growth	Kohut et al., 1982
C_4 species - Amaranthus retroflexus, Setaria faberii, Setaria lutescens (pigweed) (foxtail grasses)	650 ug/m^3, 8 hours/day for 5 days during 2 weeks. Increased weight at normal CO_2 concentrations	Carlson and Bazzaz, 1982
Lemna spp (duckweed)	390 for 6 weeks reduced growth	Fankhauser et. al., 1976
Orange (citrus)	2,080 for 23 days with 10 day interruption reduced leaf area.	Matsushima and Brewer 1972

The relatively low sensitivity of the soils in the park to acidic deposition, coupled with the extremely low ground-level SO_2 concentrations predicted for the national park, will result in no significant impact on soils in the park.

8.1.4 Impacts to Wildlife

Both physiological and ecological effects to fauna due to gaseous and particulate pollutants have been reported (Newman, 1980; Newman and Schreiber, 1988). The most severe of these effects have been observed at concentrations above the secondary national ambient air quality standards. Physiological and/or behavioral effects have also been observed in experimental animals at concentrations below these standards (see Table 8-6).

The major air quality risk to wildlife in the United States is from continuous exposure to pollutants above the national ambient air quality standards. Risks also occur for wildlife living in the vicinity of an emission source which experiences frequent "upset" or episodic conditions that occur because of malfunctioning of equipment, unique meteorological conditions or during start up emission sources (Newman and Schreiber, 1988). Under these conditions, chronic effects, e.g., particulate contamination or acute effects, such as injury to health, have been observed (Newman, 1980).

The lowest threshold values of SO_2 reported to cause physiological changes in wildlife are shown in Table 8-6. These values are well below the maximum predicted 3-hour and annual average concentrations in the National Park of 193 $\mu g/m^3$, and 9.9 $\mu g/m^3$, respectively. As a result, no significant effects on terrestrial wildlife AQRVs from SO_2 are expected.

No impacts to the Everglades National Park's wildlife or wildlife habitats, including threatened and endangered species, nor to wildlife resources in the vicinity of the Tarmac plant, are expected.

Table 8-6. Examples of Lowest Observed Effect Levels of Air Pollutants on Wildlife

Pollutant	Reported Effect	Concentration (ug/m^3)	Exposure
Sulfur Dioxide	respiratory stress in guinea pigs	427 to 854	1 hour
	respiratory stress in rats	267	7 hours/day;* 5 day/week for 10 weeks
	decreased abundance deer mice	13-157	continually for 5 months**

Source: Adapted from Newman (1981) and Newman and Schreiber (1988).

* Used to compare as a range between 3 hour and 24 hour averaging times.
** Used to compare with annual averaging times.

8.2 IMPACTS TO VISIBILITY

The Clean Air Act Amendments of 1977 provide for implementation of guidelines to prevent visibility impairment in mandatory Class I areas. The guidelines are intended to protect the aesthetic quality of these pristine areas from reduction in visual range and atmospheric discoloration due to various pollutants.

The nearest Class I area is the Everglades National Park, located about 30 km from the Tarmac site. A Level-1 visibility screening analysis was performed to determine the potential adverse visibility effects using the approach suggested in the Workbook for Plume Visual Impact Screening and Analysis (USEPA, 1988). The Level-1 screening model has been computerized by EPA. The user inputs emissions of particulates, NO_x (as NO_2), primary NO_2, soot, and primary SO_4 from the proposed source, along with transport specifications for the particular case (i.e. distance to Class I area, background visual range, meteorological conditions, etc.). Visibility impacts are determined for two parameters:

1) Contrast of a plume against a viewing background such as the sky or a terrain feature.
2) Perceptibility of a plume on the basis of the color difference between the plume and the viewing background (Delta E).

Results are provided by the model for several scenarios based on the background view, the viewing angle, visibility impairment due to plumes located both inside and outside the Class I area, and the sun angle. The critical value for contrast is 0.05 while that for Delta E is 2.00. If these levels are not exceeded by the proposed source, the source passes the Level-1 visibility analysis, and the source will not have a significant impact on the Class I area.

Input parameters and results of the Level-1 analysis for the proposed Lauderdale units are presented in Figure 8-1. As shown, Kiln 2 will emit particulates, NO_x and primary SO_4 (sulfuric acid mist). Emission rates are

Visual Effects Screening Analysis for
Source: Tarmac Kiln 2
Class I Area: Everglades NP

*** Level-1 Screening ***

Input Emissions for

Particulates	31.30	LB /HR
NOx (as NO2)	169.30	LB /HR
Primary NO2	.00	LB /HR
Soot	.00	LB /HR
Primary SO4	12.00	LB /HR

**** Default Particle Characteristics Assumed

Transport Scenario Specifications:

Background Ozone:	.04 ppm
Background Visual Range:	25.00 km
Source-Observer Distance:	30.00 km
Min. Source-Class I Distance:	30.00 km
Max. Source-Class I Distance:	50.00 km
Plume-Source-Observer Angle:	11.25 degrees
Stability: 6	
Wind Speed: 1.00 m/s	

R E S U L T S

Asterisks (*) indicate plume impacts that exceed screening criteria

Maximum Visual Impacts INSIDE Class I Area
Screening Criteria ARE NOT Exceeded

					Delta E		Contrast	
Backgrnd	Theta	Azi	Distance	Alpha	Crit	Plume	Crit	Plume
SKY	10.	84.	30.0	84.	2.00	1.500	.05	.004
SKY	140.	84.	30.0	84.	2.00	.641	.05	-.014
TERRAIN	10.	84.	30.0	84.	2.00	.896	.05	.012
TERRAIN	140.	84.	30.0	84.	2.00	.209	.05	.010

Maximum Visual Impacts OUTSIDE Class I Area
Screening Criteria ARE NOT Exceeded

					Delta E		Contrast	
Backgrnd	Theta	Azi	Distance	Alpha	Crit	Plume	Crit	Plume
SKY	10.	65.	28.0	104.	2.00	1.521	.05	.004
SKY	140.	65.	28.0	104.	2.00	.647	.05	-.015
TERRAIN	10.	50.	26.2	119.	2.00	1.036	.05	.014
TERRAIN	140.	50.	26.2	119.	2.00	.250	.05	.012

Figure 8-1 VISIBILITY SCREENING RESULTS, TARMAC KILN 2

the same as presented in Table 2-1 for Kiln 2 after conversion to cool. Primary NO_2 and soot are not emitted in significant quantities by fossil fuel combustion sources, and therefore these emissions were set to zero.

The background visual range, as determined for southeast Florida from the Workbook manual, is 25 km. Other parameters input to the model were based upon default values given in the Workbook and incorporated into the computer model.

The values of Delta E and contrast are all less than the screening criteria of 2.00 and 0.05, respectively. As a result, it is highly unlikely that emissions from the proposed coal conversion will cause adverse visibility impairment in the Everglades National Park.

8.3 IMPACTS DUE TO ASSOCIATED GROWTH

Air quality impacts due to general commercial, residential, industrial and other growth associated with the Kiln 2 Coal Conversion would potentially occur during the construction and operational phases. Since Kiln 2 is already in place, construction activities and employment will generate relatively small quantities of air pollutants that can affect air quality. The emissions from construction will be minor, since major earthworks are not necessary. Construction employment requirements are expected to be filled by existing construction and manufacturing workers that would supply the materials necessary for the conversion. The impact of this growth is insignificant relative to the existing population base in the area.

Operational employment would be about 16 personnel added to the current plant staff of 93. The additional employment is expected to originate primarily from the general population growth in the area, which would not be a direct result of the project. Based upon the above considerations, the air quality impact of the proposed project due to additional growth will be minimal.

REFERENCES

Berry, C.R. 1974. Age of pine seedlings with primary needles affects sensitivity to ozone and sulfur dioxide. Phytopathology 64: 207-209.

Carlson, R. W. and E. A. Bazzaz, 1982. Photosynthesis and growth response to fumigation with SO_2 at elevated CO_2 for C_3 and C_4 plants. Oecologia 54: 50-54.

Duever, M.J., J.E. Carlson, J.F. Meeder, L.C. Duever, L.H. Gunderson, L.A. Riopelle, T.R. Alexander, R.L. Myers, and D.P. Spangler, 1979. The Big Cypress National Preserve, Research Report No. 8 of the National Audubon Society, 2nd Printing.

Fankhauser, H., C. Brunold, and K.H. Erismann. 1976. The influence of sublethal concentrations of sulfur dioxide on morphology, growth and product yield of the duckweed _Lemna minor_ L. Oecologia 23: 201-209.

Gleason, P. J. and W. Spackman, Jr., 1974. Calcareous Periphyton and Water Chemistry in the Everglades in Environments of South Florida: Present and Past. ed. Patrick J. Gleason. Miami Geological Society. Miami, Florida. pp.146-181.

Hart, R., P. G. Webb, R. H. Biggs, and K. M. Portier, 1988. The use of lichen fumigation studies to evaluate the effects of new emission sources on Class I areas. Journal Air Pollution Control Association 38: 144-147.

Holzworth, G.C. 1972. Mixing Heights, Wind Speeds and Potential for Urban Air Pollution Throughout the Contiguous United States. Publication No. AP-101. U.S. Environmental Protection Agency.

Kohut, R. J. _et al_., 1982. The National Crop Loss Assessment Network: A Summary of Field Studies. Paper 82-69.5. Session 69. Presentation at the 75th Annual Meeting of the Air Pollution Control Association.

Loope, L. L. , D. W. Black, S. Black, and G. N. Avery, 1979. Distribution and Abundance of Flora in Limestone Rockland Pine Forests of Southeastern Florida. Report T-547. South Florida Research Center. Everglades National Park, Homestead, Florida.

Matsushima, J. and R.F. Brewer. 1972. Influence of sulfur dioxide and hydrogen fluoride as a mix or reciprocal exposure on citrus growth and development. Journal Air Pollution Control Association 22: 710-713.

Olmsted, I.C., L.L. Loope, and R.E. Rintz, 1980. A Survey and Baseline Analysis of Aspects of the Vegetation of Taylor Slough, Everglades National Park. Report T-586. South Florida Research Center. Everglades National Park. Homestead, Florida 33030.

Shanklin, J. and T. T. Kozlowski, 1985. Effect of flooding of soil on growth and subsequent responses of _Taxodium distichum_ seedlings to SO_2. Environmental Pollution (Series A) 38: 199-212 Smith, 1973.

Taylor, D. L. and A. Herndon, 1981. Impact of 22 Years of Fire on Understory Hardwood Shrubs in Slash Pine Communities within Everglades National Park. Report T-640. South Florida Research Center. Everglades National Park, Homestead, Florida.

Wood, D. A., July, 1987. Official Lists of Endangered and Potentially Endangered Fauna and Flora in Florida. Florida Game and Fresh Water Fish Commission, Tallahassee, Florida.

Appendix A
Reference Materials

EXERPT FROM 1980 PERMIT APPLICATION

KILN 2 COAL CONVERSION

Section V, Item 2 Emission Estimates (continued)

Sulfur Dioxide

Calculations based upon 0.08% SO_3 in raw feed, 2.0% S coal, and 91.3% SO_2 removal inherent in process based upon stack test results.

Coal:

Feed: 81,000 #/hr. x 0.0008 x $\frac{32}{80}$ = 25.92 #S/hr.

Fuel: 15,000 #/hr. x 0.02 = 300.0 #S/hr.

Total Input SO_2: = x 2
651.84 #SO_2/hr.

Maximum emitted = 651.84 x (1 - 0.913) = 56.7 #SO_2/hr.
Annual & Potential = 56.7 #/hr x 8760 hr/yr ÷ 2000 #/ton
= 248.4 TPY

Gas:

Feed: 81,000 #/hr x 0.0008 x $\frac{32}{80}$ = 25.92 #S/hr.
x2
Total Input = 51.84 #SO_2/hr.

Maximum Emitted = 51.84 #/hr x (1 - 0.913) = 4.5 #SO_2/hr.
Annual & Potential = 4.5#/hr x 8760 ÷ 2000 = 19.7 TPY

Oil: Base on recent stack test (June, 1979)

Maximum emitted = 0.2519 #/MM BTu x 180 MM BTu/hr = 45.3 # SO_2/hr
Annual & Potential = 45.3 #/hr x 8760 ÷ 2000 = 198.6 TPY

EXCERPT FROM 1980 PERMIT APPLICATION

KILN 3 COAL CONVERSION

Section V, Item #2: Emission Estimates

Sulfur Dioxide:

Calculation based upon 0.08% SO_3 in raw feed, 2.0% coal and 98.7% SO_2 removal inherent inprocess based upon stack test results.

Coal: based on recent stack test on similar sulfur content oil

Sulfur input:

feed: 283,500 lbs/hr x 0.0008 x 32/80 = 90.72 #/hr

fuel: 46,000 lbs/hr x 0.02 = 920,00 #/hr

1010.72 #/hr. sulfur

Total input: x2

=2021.44 #/hr SO_2

Maximum emitted=2021.44 #/hr x (1-.987) = 26.28 #/hr.

Annual & Potential=26.28 #/hr x 8760 ÷ 2000 = 115.1 TPY

Gas: 283,500 lbs/hr x 0.0008 x 32/80 x 2 x (1-.987) = 2/36 #/hr SO_2

Annual & Potential =2.36 #/hr x 8760 ÷ 2000 = 10.3 TPY

Oil: Based on recent stack test at 2.37% sulfur, #6 fuel oil

0.0397 #/MMBTU x 552 MMBTU/hr. (max.) = 21.9 #/hr

Annual & Potential = 21.9 #/hr x 8760 ÷ 2000 = 95.9 TPY

NO_x TEST DATA

KILN 2 - GAS & OIL

1980

TABLE T-2

MIAMI STACK EMISSION SURVEY
NOX EMISSION RATE - EPA METHOD 7

1980

Run No.	Sample No.	Kiln No.	Fuel Type	Date 1980	Lbs. NO_2 Hr.	Lbs. NO_2 Ton Clnk.	Lbs. NO_2 LB.F.Gas	PPM*
1	1	2	Gas	3-20	211.5	9.95	9.45	435
1	2	2	Gas	3-20	109.1	5.13	4.88	224
1	3	2	Gas	3-20	107.4	5.05	4.80	221
1	4	2	Gas	3-20	101.8	4.79	4.55	209
1	5	2	Gas	3-20	96.7	4.55	4.32	199
1	6	2	Gas	3-20	95.4	4.49	4.26	196
1	7	2	Gas	3-20	91.2	4.29	4.08	188
1	8	2	Gas	3-20	57.1	2.69	2.55	117
1	9	2	Gas	3-20	86.5	4.07	3.87	178
1	10	2	Gas	3-20	89.1	4.19	3.98	183
	11	2	Gas	3-20	124.5	5.86	5.56	256
1	12	2	Gas	3-20	35.6	1.68	1.59	73
	AVE.				100.5	4.73	4.49	207
2	1	2	Oil	3-21	148.0	5.92	7.64	353
2	2	2	Oil	3-21	125.8	5.03	6.50	300
2	3	2	Oil	3-21	147.7	5.91	7.63	352
2	4	2	Oil	3-21	140.8	5.63	7.27	336
2	5	2	Oil	3-21	143.7	5.75	7.42	343
2	6	2	Oil	3-21	267.6	10.70	13.82	638
2	7	2	Oil	3-21	252.6	10.10	13.05	602
2	8	2	Oil	3-21	114.1	4.56	5.89	272
2	9	2	Oil	3-21	81.4	3.26	4.20	194
2	10	2	Oil	3-21	141.3	5.65	7.30	337
2	11	2	Oil	3-21	217.8	8.71	11.25	519
2	12	2	Oil	3-21	233.5	9.34	12.00	557
	AVE				167.9	6.71	8.66	400

VOC TESTING

KILN 3

JULY, 1988

Tarmac

TARMAC FLORIDA, INC.
EMISSION TESTS -- KILN NO. 3

< VOC's >

	July 5, 1988 [Background]	August 9, 1988 [Burning Soils]	October 4, 1988 [Burning RDF]
1	59.21	92.04	50.99
2	59.90	72.68	60.28
3	108.50	72.91	35.29
AVERAGE	75.87	79.21	48.85

Tarmac

** PROCESS DATA **

REPORT NO: ____________

COMPANY: Tarmac Florida, Inc. DATE: 7/05/88

SOURCE: Kiln # 3 PERMIT NO: A013-144183

TYPE OF INSTALLATION: Cement Production Plant

TYPE OF MATERIAL PROCESSED: limestone, mineral aggregates

TYPE(s) OF FUEL USED: coal

TYPE OF POLLUTION CONTROL SYSTEM: electrostatic precipitator

GENERAL CONDITION OF CONTROL EQUIPMENT: normal

	RUN 1	RUN 2	RUN 3
FEED RATE (tons/hr):	133.5	133.5	133.5
PRODUCTION RATE (tons/hr):	85.1	85.1	85.1
FUEL RATE (tons/hr):	18.2	18.1	17.9

OPERATING CURRENT: see attached sheet

COMPANY REPRESENTATIVE: Scott Quaas

TITLE: Environmental Specialist

SIGNATURE: Scott Quaas

VOC Emission Estimates

1. Baseline Emissions, Kiln 2, gas/oil:

   From VOC test on Kiln 3 (7/5/88)

   Average VOC emissions = 75.9 lb/hr
   Clinker produced = 85.1 TPH
   Fuel rate = 18.07 TPH coal

   VOC due to coal burning (total organics):

   AP-42 factor = 0.10 lb/ton
   18.07 TPH x 0.1 lb/ton = 1.81 lb/hr

   VOC due to organics in raw feed = 75.9 lb/hr - 1.8 lb/hr
   = 74.1 lb/hr

   74.1 lb/hr / 85.1 TPH clinker = 0.87 lb/ton clinker

   VOC from Kiln 2 due to organics:

   25 TPH clinker x 0.87 lb/ton = 21.8 lb/hr

   VOC from Kiln 2 due to fuel oil burning:

   AP-42 factor = 1.04 lb/1,000 gal
   Maximum heat input to Kiln 2 (existing) = 180 x 10^6 Btu/hr
   180 x 10^6 Btu/hr / 145,000 Btu/gal = 1,241 gal/hr
   1,241 gal/hr x 1.04 lb/1,000 gal = 1.3 lb/hr

   Total VOC emissions from Kiln 2 when burning oil:

   21.8 lb/hr + 1.3 lb/hr = 23.1 lb/hr

2. Future Emissions, Kiln 2, coal:

   VOC due to organics in raw feed:

   25 TPH x 0.87 lb/ton = 21.8 lb/hr

   VOC due to coal burning:

   6.5 TPH coal x 0.10 lb/ton = 0.7 lb/hr

   Total VOC:

   21.8 lb/hr + 0.7 lb/hr = 22.5 lb/hr
   To allow margin of safety, estimate maximum VOC emissions to be 30 lb/hr.
   Equivalent lb/ton clinker -
   30 lb/hr / 25 TPH = 1.2 lb/ton clinker

EXCERPTS FROM

"AP-42"

AND

"TOXIC AIR POLLUTANT EMISSION FACTORS"

TABLE 8.6-1. UNCONTROLLED EMISSION FACTORS FOR CEMENT MANUFACTURING[a]

EMISSION FACTOR RATING: E

Process	Particulate[b]		Sulfur dioxide[c]: Mineral source[d]		Sulfur dioxide[c]: Gas combustion		Sulfur dioxide[c]: Oil combustion		Sulfur dioxide[c]: Coal combustion		Nitrogen oxides		Lead	
	kg/Mg	lb/ton	kg/Mg	lb/ton	kg/Mg	lb/ton	kg/Mg	lb/ton	kg/Mg	lb/ton	kg/Mg	lb/ton	kg/Mg	lb/ton
Dry process kiln	128	256	5.4	10.8	Neg	Neg	2.2S	4.4S	3.6S	7.2S	1.4	2.8	0.06	0.12
Wet process kiln	120	240	5.4	10.8	Neg	Neg	2.2S	4.4S	3.6S	7.2S	1.4	2.8	0.05	0.10
Clinker cooler[e]	4.6	9.2	-	-	-	-	-	-	-	-	-	-	-	-
Dryers, grinders, etc.[f]														
Wet process	16.0	32.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.01	0.02
Dry process	48.0	96.0	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	0.02	0.04

[a]References 1-2. Expressed in terms of units of clinker produced, assuming 5% gypsum in finished cement. Includes fuel combustion emissions, which should not be calculated separately. Neg = negligible. S = % sulfur in fuel. Dash = no data. NA = not applicable.

[b]Emission Factor Rating: B

[c]Factors account for reactions with alkaline dust, with no controls. One test series for gas and oil fired wet process kilns, with limited data, suggests that 21-45% of SO_2 can be removed by reactions with the alkaline filter cake, if baghouses are used.

[d]From sulfur in raw materials, which varies with their sources. Factors account for some residual sulfur, because of its alkalinity and affinity for SO_2.

[e]Reference 8. Emission Factor Rating: D.

[f]Expressed in terms of units of cement produced.

TABLE 8.6-3. SIZE SPECIFIC PARTICULATE EMISSION FACTORS FOR CEMENT KILNS[a]

EMISSION FACTOR RATING: D

Particle size (µm)	Cumulative mass % < stated size[b]						Cumulative emission factor < stated size[c]											
	Uncontrolled		Dry process kiln with multiclone[d]	Wet process kiln with ESP	Baghouse		Uncontrolled				Dry process with multiclone[d]		Wet process with ESP		Baghouse			
	Wet process kiln	Dry process kiln			Wet process kiln	Dry process kiln	Wet Process		Dry Process						Wet process		Dry process	
							kg/Mg	lb/ton	kg/Mg	lb/ton	kg/Mg	lb/ton	kg/Mg	lb/ton	kg/Mg	lb/ton	kg/Mg	lb/ton
2.5	7.0	18	3.8	64	NA	45	8.4	17	23	46	5.0	10	0.25	0.50	NA	NA	0.073	0.15
5.0	20	NA	14	83	NA	77	24	48	-	-	19	38	0.32	0.64	NA	NA	0.13	0.26
10.0	24	42	24	85	NA	84	29	58	54	108	32	64	0.33	0.66	NA	NA	0.14	0.28
15.0	35	44	31	91	NA	89	43	86	57	114	41	82	0.36	0.72	NA	NA	0.15	0.30
20.0	57	NA	38	98	NA	100	68	136	-	-	49	98	0.39	0.78	NA	NA	0.16	0.32
Total mass emission factor							120[e]	240[e]	128[e]	256[e]	130[f]	260[f]	0.39[f]	0.78[f]	0.57[f]	1.1[f]	0.16[f]	0.32[f]

[a]Reference 8. ESP = electrostatic precipitator. NA = not available. Dash = no data.
[b]Aerodynamic diameter. Percentages rounded to two significant figures.
[c]Expressed as unit weight of particulate/unit weight of clinker produced, assuming 5% gypsum in finished cement. Rounded to two significant figures.
[d]Based on a single test, and should be used with caution.
[e]From Table 8.6-1.
[f]From Table 8.6-2.

TABLE 1.4-1. UNCONTROLLED EMISSION FACTORS FOR NATURAL GAS COMBUSTION[a]

Furnace size & type (10^6 Btu/hr heat input)	Particulate[b]		Sulfur dioxide[c]		Nitrogen oxides[d]		Carbon monoxide[e]		Volatile organics			
									Nonmethane		Methane	
	$kg/10^6 m^3$	$lb/10^6 ft^3$	$kg/10^6 m^3$	$lb/10^6 ft^3$	$kg/10^6 m^3$	$lb/10^6 ft^3$	$kg/10^6 m^3$	$lb/10^6 ft^3$	$kg/10^6 m^3$	$lb/10^6 ft^3$	$kg/10^6 m^3$	$lb/10^6 ft^3$
Utility boilers (> 100)	16 - 80	1 - 5	9.6	0.6	8800[h]	550[h]	640	40	23	1.4	4.8	0.3
Industrial boilers (10 - 100)	16 - 80	1 - 5	9.6	0.6	2240	140	560	35	44	2.8	48	3
Domestic and commercial boilers (< 10)	16 - 80	1 - 5	9.6	0.6	1600	100	320	20	84	5.3	43	2.7

[a]Expressed as weight/volume fuel fired.
[b]References 15-18.
[c]Reference 4. Based on avg. sulfur content of natural gas, 4600 $g/10^6 Nm^3$ (2000 $gr/10^6$ scf).
[d]References 4-5, 7-8, 11, 14, 18-19, 21.
[e]Expressed as NO_2. Tests indicate about 95 weight % NO_x is NO_2.
[f]References 4, 7-8, 16, 18, 22-25.
[g]References 16, 18. May increase 10 - 100 times with improper operation or maintenance.
[h]For tangentially fired units, use 4400 $kg/10^6 m^3$ (275 $lb/10^6 ft^3$). At reduced loads, multiply factor by load reduction coefficient in Figure 1.4-1. For potential NO_x reductions by combustion modification, see text. Note that NO_x reduction from these modifications will also occur at reduced load conditions.

TABLE 1.3-1. UNCONTROLLED EMISSION FACTORS FOR FUEL OIL COMBUSTION

EMISSION FACTOR RATING: A

Boiler Type[a]	Particulate Matter[b]		Sulfur Dioxide[c]		Sulfur Trioxide		Carbon Monoxide[d]		Nitrogen Oxide[e]		Volatile Organics[f] Nonmethane		Volatile Organics[f] Methane	
	kg/10^3 l	lb/10^3 gal	kg/10^3 l	lb/10^3 gal	kg/10^3 l	lb/10^3 gal	kg/10^3 l	lb/10^3 gal	kg/10^3 l	lb/10^3 gal	kg/10^3 l	lb/10^3 gal	kg/10^3 l	lb/10^3 gal
Utility Boilers														
Residual Oil	g	g	19S	157S	0.34S[h]	2.9S[h]	0.6	5	8.0 (12.6)(5)[i]	67 (105)(42)[i]	0.09	0.76	0.03	0.28
Industrial Boilers														
Residual Oil	g	g	19S	157S	0.24S	2S	0.6	5	6.6[j]	55[j]	0.034	0.28	0.12	1.0
Distillate Oil	0.24	2	17S	142S	0.24S	2S	0.6	5	2.4	20	0.024	0.2	0.006	0.052
Commercial Boilers														
Residual Oil	g	g	19S	157S	0.24S	2S	0.6	5	6.6	55	0.14	1.13	0.057	0.475
Distillate Oil	0.24	2	17S	142S	0.24S	2S	0.6	5	2.4	20	0.04	0.34	0.026	0.216
Residential Furnaces														
Distillate Oil	0.3	2.5	17S	142S	0.24S	2S	0.6	5	2.2	18	0.085	0.713	0.214	1.78

[a] Boilers can be approximately classified according to their gross (higher) heat rate as shown below:
- Utility (power plant) boilers: $>106 \times 10^9$ J/hr ($>100 \times 10^6$ Btu/hr)
- Industrial boilers: 10.6×10^9 to 106×10^9 J/hr (10×10^6 to 100×10^6 Btu/hr)
- Commercial boilers: 0.5×10^9 to 10.6×10^9 J/hr (0.5×10^6 to 10×10^6 Btu/hr)
- Residential furnaces: $<0.5 \times 10^9$ J/hr ($<0.5 \times 10^6$ Btu/hr)

[b] References 3-7 and 24-25. Particulate matter is defined in this section as that material collected by EPA Method 5 (front half catch).

[c] References 1-5. S indicates that the weight % of sulfur in the oil should be multiplied by the value given.

[d] References 3-5 and 8-10. Carbon monoxide emissions may increase by factors of 10 to 100 if the unit is improperly operated or not well maintained.

[e] Expressed as NO_2. References 1-5, 8-11, 17 and 26. Test results indicate that at least 95% by weight of NO_x is NO for all boiler types except residential furnaces, where about 75% is NO.

[f] References 18-21. Volatile organic compound emissions are generally negligible unless boiler is improperly operated or not well maintained, in which case emissions may increase by several orders of magnitude.

[g] Particulate emission factors for residual oil combustion are, on average, a function of fuel oil grade and sulfur content:
- Grade 6 oil: 1.25(S) + 0.38 kg/10^3 liter [10(S) + 3 lb/10^3 gal] where S is the weight % of sulfur in the oil. This relationship is based on 81 individual tests and has a correlation coefficient of 0.65.
- Grade 5 oil: 1.25 kg/10^3 liter (10 lb/10^3 gal)
- Grade 4 oil: 0.88 kg/10^3 liter (7 lb/10^3 gal)

[h] Reference 25.

[i] Use 5 kg/10^3 liters (42 lb/10^3 gal) for tangentially fired boilers, 12.6 kg/10^3 liters (105 lb/10^3 gal) for vertical fired boilers, and 8.0 kg/10^3 liters (67 lb/10^3 gal) for all others, at full load and normal (>15%) excess air. Several combustion modifications can be employed for NO_x reduction: (1) limited excess air can reduce NO_x emissions 5-20%, (2) staged combustion 20-40%, (3) using low NO_x burners 20-50%, and (4) ammonia injection can reduce NO_x emissions 40-70% but may increase emissions of ammonia. Combinations of these modifications have been employed for further reductions in certain boilers. See Reference 23 for a discussion of these and other NO_x reducing techniques and their operational and environmental impacts.

[j] Nitrogen oxides emissions from residual oil combustion in industrial and commercial boilers are strongly related to fuel nitrogen content, estimated more accurately by the empirical relationship:
kg $NO_2/10^3$ liters $= 2.75 + 50(N)^2$ [lb $NO_2/10^3$gal $= 22 + 400(N)^2$] where N is the weight % of nitrogen in the oil. For residual oils having high (>0.5 weight %) nitrogen content, use 15 kg $NO_2/10^3$ liter (120 lb $NO_2/10^3$gal) as an emission factor.

TABLE 1.1-1. EMISSION FACTORS FOR EXTERNAL BITUMINOUS AND SUBBITUMINOUS COAL COMBUSTION[a]

Firing Configuration	Particulate[b] kg/Mg	Particulate[b] lb/ton	Sulfur Oxides[c] kg/Mg	Sulfur Oxides[c] lb/ton	Nitrogen Oxides[d] kg/Mg	Nitrogen Oxides[d] lb/ton	Carbon Monoxide[e] kg/Mg	Carbon Monoxide[e] lb/ton	Nonmethane VOC[e,f] kg/Mg	Nonmethane VOC[e,f] lb/ton	Methane[e] kg/Mg	Methane[e] lb/ton
Pulverized coal fired												
Dry bottom	5A	10A	19.5S(17.5S)	39S(35S)	10.5(7.5)[g]	21(15)[g]	0.3	0.6	0.04	0.07	0.015	0.03
Wet bottom	3.5A[h]	7A[h]	19.5S(17.5S)	39S(35S)	17	34	0.3	0.6	0.04	0.07	0.015	0.03
Cyclone furnace	1A[h]	2A[h]	19.5S(17.5S)	39S(35S)	18.5	37	0.3	0.6	0.04	0.07	0.015	0.03
Spreader stoker												
Uncontrolled	30[j]	60[j]	19.5S(17.5S)	39S(35S)	7	14	2.5	5	0.04	0.07	0.015	0.03
After multiple cyclone												
With fly ash reinjection from multiple cyclone	8.5	17	19.5S(17.5S)	39S(35S)	7	14	2.5	5	0.04	0.07	0.015	0.03
No fly ash reinjection from multiple cyclone	6	12	19.5S(17.5S)	39S(35S)	7	14	2.5	5	0.04	0.07	0.015	0.03
Overfeed stoker[k]												
Uncontrolled	8[m]	16[m]	19.5S(17.5S)	39S(35S)	3.25	7.5	3	6	0.04	0.07	0.015	0.03
After multiple cyclone	4.5[n]	9[n]	19.5S(17.5S)	39S(35S)	3.25	7.5	3	6	0.04	0.07	0.015	0.03
Underfeed stoker												
Uncontrolled	7.5[p]	15[p]	15.5S	31S	4.75	9.5	5.5	11	0.65	1.3	0.4	0.8
After multiple cyclone	5.5[n]	11[n]	15.5S	31S	4.75	9.5	5.5	11	0.65	1.3	0.4	0.8
Handfired units	7.5	15	15.5S	31S	1.5	3	45	90	5	10	4	8

[a] Factors represent uncontrolled emissions unless otherwise specified and should be applied to coal consumption as fired.

[b] Based on EPA Method 5 (front half catch) as described in Reference 12. Where particulate is expressed in terms of coal ash content, A, factor is determined by multiplying weight % ash content of coal (as fired) by the numerical value preceding the "A". For example, if coal having 8% ash is fired in a dry bottom unit, the particulate emission factor would be 5 x 8, or 40 kg/Mg (80 lb/ton). The "condensible" matter collected in back half catch of EPA Method 5 averages <5% of front half, or "filterable", catch for pulverized coal and cyclone furnaces; 10% for spreader stokers; 15% for other stokers; and 50% for handfired units (References 6, 19, 49).

[c] Expressed as SO_2, including SO_2, SO_3 and gaseous sulfates. Factors in parentheses should be used to estimate gaseous SO_x emissions for subbituminous coal. In all cases, "S" is weight % sulfur content of coal as fired. See Footnote b for example calculation. On average for bituminous coal, 97% of fuel sulfur is emitted as SO_2, and only about 0.7% of fuel sulfur is emitted as SO_3 and gaseous sulfate. An equally small percent of fuel sulfur is emitted as particulate sulfate (References 9, 13). Small quantities of sulfur are also retained in bottom ash. With subbituminous coal generally about 10% more fuel sulfur is retained in the bottom ash and particulate because of the more alkaline nature of the coal ash. Conversion to gaseous sulfate appears about the same as for bituminous coal.

[d] Expressed as NO_2. Generally, 95 - 99 volume % of nitrogen oxides present in combustion exhaust will be in the form of NO, the rest NO_2 (Reference 11). To express factors as NO, multiply by factor of 0.66. All factors represent emission at baseline operation (i.e., 60 - 110% load and no NO_x control measures, as discussed in text).

[e] Nominal values achieveable under normal operating conditions. Values one or two orders of magnitude higher can occur when combustion is not complete.

[f] Nonmethane volatile organic compounds (VOC), expressed as C_2 to C_{16} n-alkane equivalents (Reference 58). Because of limited data on NMVOC available to distinguish the effects of firing configuration, all data were averaged collectively to develop a single average for pulverized coal units, cyclones, spreaders and overfeed stokers.

[g] Parenthetic value is for tangentially fired boilers.

[h] Uncontrolled particulate emissions, when no fly ash reinjection is employed. When control device is installed, and collected fly ash is reinjected to boiler, particulate from boiler reaching control equipment can increase by up to a factor of two.

[j] Accounts for fly ash settling in an economizer, air heater or breeching upstream of control device or stack. (Particulate directly at boiler outlet typically will be twice this level.) Factor should be applied even when fly ash is reinjected to boiler from boiler, air heater or economizer dust hoppers.

[k] Includes traveling grate, vibrating grate and chain grate stokers.

[m] Accounts for fly ash settling in breeching or stack base. Particulate loadings directly at boiler outlet typically can be 50% higher.

[n] See text for discussion of apparently low multiple cyclone control efficiencies, regarding uncontrolled emissions.

[p] Accounts for fly ash settling in breeching downstream of boiler outlet.

11.2.1 UNPAVED ROADS

11.2.1.1 General

Dust plumes trailing behind vehicles traveling on unpaved roads are a familiar sight in rural areas of the United States. When a vehicle travels an unpaved road, the force of the wheels on the road surface causes pulverization of surface material. Particles are lifted and dropped from the rolling wheels, and the road surface is exposed to strong air currents in turbulent shear with the surface. The turbulent wake behind the vehicle continues to act on the road surface after the vehicle has passed.

11.2.1.2 Emissions And Correction Parameters

The quantity of dust emissions from a given segment of unpaved road varies linearly with the volume of traffic. Also, field investigations have shown that emissions depend on correction parameters (average vehicle speed, average vehicle weight, average number of wheels per vehicle, road surface texture and road surface moisture) that characterize the condition of a particular road and the associated vehicle traffic.[1-4]

Dust emissions from unpaved roads have been found to vary in direct proportion to the fraction of silt (particles smaller than 75 micrometers in diameter) in the road surface materials.[1] The silt fraction is determined by measuring the proportion of loose dry surface dust that passes a 200 mesh screen, using the ASTM-C-136 method. Table 11.2.1-1 summarizes measured silt values for industrial and rural unpaved roads.

The silt content of a rural dirt road will vary with location, and it should be measured. As a conservative approximation, the silt content of the parent soil in the area can be used. However, tests show that road silt content is normally lower than in the surrounding parent soil, because the fines are continually removed by the vehicle traffic, leaving a higher percentage of coarse particles.

Unpaved roads have a hard nonporous surface that usually dries quickly after a rainfall. The temporary reduction in emissions because of precipitation may be accounted for by not considering emissions on "wet" days (more than 0.254 millimeters [0.01 inches] of precipitation).

The following empirical expression may be used to estimate the quantity of size specific particulate emissions from an unpaved road, per vehicle kilometer traveled (VKT) or vehicle mile traveled (VMT), with a rating of A:

$$E = k(1.7)\left(\frac{s}{12}\right)\left(\frac{S}{48}\right)\left(\frac{W}{2.7}\right)^{0.7}\left(\frac{w}{4}\right)^{0.5}\left(\frac{365-p}{365}\right) \quad \text{(kg/VKT)} \qquad (1)$$

$$E = k(5.9)\left(\frac{s}{12}\right)\left(\frac{S}{30}\right)\left(\frac{W}{3}\right)^{0.7}\left(\frac{w}{4}\right)^{0.5}\left(\frac{365-p}{365}\right) \quad \text{(lb/VMT)}$$

TABLE 11.2.1-1. TYPICAL SILT CONTENT VALUES OF SURFACE MATERIALS ON INDUSTRIAL AND RURAL UNPAVED ROADS[a]

Industry	Road Use Or Surface Material	Plant Sites	Test Samples	Silt (%, w/w) Range	Mean
Copper smelting	Plant road	1	3	[15.9 - 19.1]	[17.0]
Iron and steel production	Plant road	9	20	4.0 - 16.0	8.0
Sand and gravel processing	Plant road	1	3	[4.1 - 6.0]	[4.8]
Stone quarrying and processing	Plant road	1	5	[10.5 - 15.6]	[14.1]
Taconite mining and processing	Haul road	1	12	[3.7 - 9.7]	[5.8]
	Service road	1	8	[2.4 - 7.1]	[4.3]
Western surface coal mining	Access road	2	2	4.9 - 5.3	5.1
	Haul road	3	21	2.8 - 18	8.4
	Scraper road	3	10	7.2 - 25	17
	Haul road (freshly graded)	2	5	18 - 29	24
Rural roads	Gravel	1	1	NA	[5.0]
	Dirt	2	5	5.8 - 68	28.5
	Crushed limestone	2	8	7.7 - 13	9.6

[a]References 4 - 11. Brackets indicate silt values based on samples from only one plant site.
NA = Not available.

where: E = emission factor
k = particle size multiplier (dimensionless)
s = silt content of road surface material (%)
S = mean vehicle speed, km/hr (mph)
W = mean vehicle weight, Mg (ton)
w = mean number of wheels
p = number of days with at least 0.254 mm (0.01 in.) of precipitation per year

The particle size multiplier, k, in Equation 1 varies with aerodynamic particle size range as follows:

Aerodynamic Particle Size Multiplier For Equation 1

$\leq$30 µm	$\leq$15 µm	$\leq$10 µm	$\leq$5 µm	$\leq$2.5 µm
0.80	0.50	0.36	0.20	0.095

The number of wet days per year, p, for the geographical area of interest should be determined from local climatic data. Figure 11.2.1-1 gives the geographical distribution of the mean annual number of wet days per year in the United States.

Equation 1 retains the assigned quality rating if applied within the ranges of source conditions that were tested in developing the equation, as follows:

RANGES OF SOURCE CONDITIONS FOR EQUATION 1

Equation	Road silt content (%, w/w)	Mean vehicle weight		Mean vehicle speed		Mean no. of wheels
		Mg	ton	km/hr	mph	
1	4.3 - 20	2.7 - 142	3 - 157	21 - 64	13 - 40	4 - 13

Also, to retain the quality rating of the equation applied to a specific unpaved road, it is necessary that reliable correction parameter values for the specific road in question be determined. The field and laboratory procedures for determining road surface silt content are given in Reference 4. In the event that site specific values for correction parameters cannot be obtained, the appropriate mean values from Table 11.2.1-1 may be used, but the quality rating of the equation is reduced to B.

Equation 1 was developed for calculation of annual average emissions, and thus, is to be multiplied by annual vehicle distance traveled (VDT). Annual average values for each of the correction parameters are to be substituted into

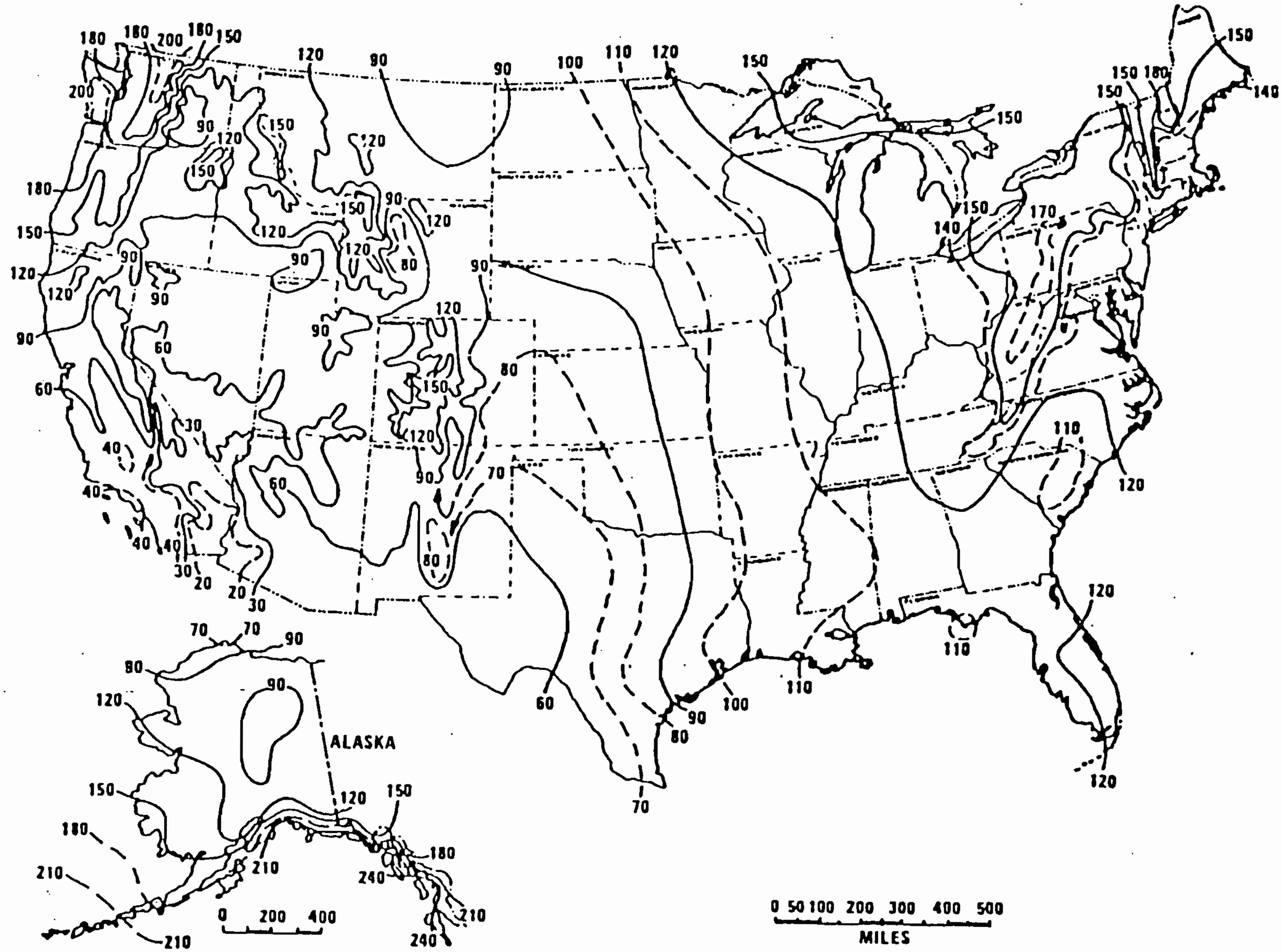

Figure 11.2.1-1. Mean number of days with 0.01 inch or more of precipitation in United States.[10]

the equation. Worst case emissions, corresponding to dry road conditions, may be calculated by setting p = 0 in the equation (which is equivalent to dropping the last term from the equation). A separate set of nonclimatic correction parameters and a higher than normal VDT value may also be justified for the worst case averaging period (usually 24 hours). Similarly, to calculate emissions for a 91 day season of the year using Equation 1, replace the term (365-p)/365 with the term (91-p)/91, and set p equal to the number of wet days in the 91 day period. Also, use appropriate seasonal values for the nonclimatic correction parameters and for VDT.

11.2.1.3 Control Methods

Common control techniques for unpaved roads are paving, surface treating with penetration chemicals, working into the roadbed of chemical stabilization chemicals, watering, and traffic control regulations. Chemical stabilizers work either by binding the surface material or by enhancing moisture retention. Paving, as a control technique, is often not economically practical. Surface chemical treatment and watering can be accomplished with moderate to low costs, but frequent retreatments are required. Traffic controls, such as speed limits and traffic volume restrictions, provide moderate emission reductions but may be difficult to enforce. The control efficiency obtained by speed reduction can be calculated using the predictive emission factor equation given above.

The control efficiencies achievable by paving can be estimated by comparing emission factors for unpaved and paved road conditions, relative to airborne particle size range of interest. The predictive emission factor equation for paved roads, given in Section 11.2.6, requires estimation of the silt loading on the traveled portion of the paved surface, which in turn depends on whether the pavement is periodically cleaned. Unless curbing is to be installed, the effects of vehicle excursion onto shoulders (berms) also must be taken into account in estimating control efficiency.

The control efficiencies afforded by the periodic use of road stabilization chemicals are much more difficult to estimate. The application parameters which determine control efficiency include dilution ratio, application intensity (mass of diluted chemical per road area) and application frequency. Between applications, the control efficiency is usually found to decay at a rate which is proportional to the traffic count. Therefore, for a specific chemical application program, the average efficiency is inversely proportional to the average daily traffic count. Other factors that affect the performance of chemical stabilizers include vehicle characteristics (e. g., average weight) and road characteristics (e. g., bearing strength).

Water acts as a road dust suppressant by forming cohesive moisture films among the discrete grains of road surface material. The average moisture level in the road surface material depends on the moisture added by watering and natural precipitation and on the moisture removed by evaporation. The natural evaporative forces, which vary with geographic location, are enhanced by the movement of traffic over the road surface. Watering, because of the frequency of treatments required, is generally not feasible for public roads and is used effectively only where water and watering equipment are available and where roads are confined to a single site, such as a construction location.

References for Section 11.2.1

1. C. Cowherd, Jr., et al., Development of Emission Factors for Fugitive Dust Sources, EPA-450/3-74-037, U. S. Environmental Protection Agency, Research Triangle Park, NC, June 1974.

2. R. J. Dyck and J. J. Stukel, "Fugitive Dust Emissions from Trucks on Unpaved Roads", Environmental Science and Technology, 10(10):1046-1048, October 1976.

3. R. O. McCaldin and K. J. Heidel, "Particulate Emissions from Vehicle Travel over Unpaved Roads", Presented at the 71st Annual Meeting of the Air Pollution Control Association, Houston, TX, June 1978.

4. C. Cowherd, Jr., et al., Iron and Steel Plant Open Dust Source Fugitive Emission Evaluation, EPA-600/2-79-103, U. S. Environmental Protection Agency, Research Triangle Park, NC, May 1979.

5. R. Bohn, et al., Fugitive Emissions from Integrated Iron and Steel Plants, EPA-600/2-78-050, U. S. Environmental Protection Agency, Research Triangle Park, NC, March 1978.

6. R. Bohn, Evaluation of Open Dust Sources in the Vicinity of Buffalo, New York, U. S. Environmental Protection Agency, New York, NY, March 1979.

7. C. Cowherd, Jr., and T. Cuscino, Jr., Fugitive Emissions Evaluation, Equitable Environmental Health, Inc., Elmhurst, IL, February 1977.

8. T. Cuscino, Jr., et al., Taconite Mining Fugitive Emissions Study, Minnesota Pollution Control Agency, Roseville, MN, June 1979.

9. K. Axetell and C. Cowherd, Jr., Improved Emission Factors for Fugitive Dust from Western Surface Coal Mining Sources, 2 Volumes, EPA Contract No. 68-03-2924, PEDCo Environmental, Inc., Kansas City, MO, July 1981.

10. T. Cuscino, Jr., et al., Iron and Steel Plant Open Source Fugitive Emission Control Evaluation, EPA-600/2-83-110, U. S. Environmental Protection Agency, Research Triangle Park, NC, October 1983.

11. J. Patrick Reider, Size Specific Emission Factors for Uncontrolled Industrial and Rural Roads, EPA Contract No. 68-02-3158, Midwest Research Institute, Kansas City, MO, September 1983.

12. C. Cowherd, Jr., and P. Englehart, Size Specific Particulate Emission Factors for Industrial and Rural Roads, EPA-600/7-85-038, U. S. Environmental Protection Agency, Research Triangle Park, NC, September 1985.

13. Climatic Atlas of the United States, U. S. Department of Commerce, Washington, DC, June 1968.

11.2.3 AGGREGATE HANDLING AND STORAGE PILES

11.2.3.1 General

Inherent in operations that use minerals in aggregate form is the maintenance of outdoor storage piles. Storage piles are usually left uncovered, partially because of the need for frequent material transfer into or out of storage.

Dust emissions occur at several points in the storage cycle, during material loading onto the pile, during disturbances by strong wind currents, and during loadout from the pile. The movement of trucks and loading equipment in the storage pile area is also a substantial source of dust.

11.2.3.2 Emissions and Correction Parameters

The quantity of dust emissions from aggregate storage operations varies with the volume of aggregate passing through the storage cycle. Also, emissions depend on three correction parameters that characterize the condition of a particular storage pile: age of the pile, moisture content and proportion of aggregate fines.

When freshly processed aggregate is loaded onto a storage pile, its potential for dust emissions is at a maximum. Fines are easily disaggregated and released to the atmosphere upon exposure to air currents from aggregate transfer itself or high winds. As the aggregate weathers, however, potential for dust emissions is greatly reduced. Moisture causes aggregation and cementation of fines to the surfaces of larger particles. Any significant rainfall soaks the interior of the pile, and the drying process is very slow.

Field investigations have shown that emissions from aggregate storage operations vary in direct proportion to the percentage of silt (particles $< 75\ \mu m$ in diameter) in the aggregate material.[1,3] The silt content is determined by measuring the proportion of dry aggregate material that passes through a 200 mesh screen, using ASTM-C-136 method. Table 11.2.3-1 summarizes measured silt and moisture values for industrial aggregate materials.

11.2.3.3 Predictive Emission Factor Equations

Total dust emissions from aggregate storage piles are contributions of several distinct source activities within the storage cycle:

1. Loading of aggregate onto storage piles (batch or continuous drop operations).
2. Equipment traffic in storage area.
3. Wind erosion of pile surfaces and ground areas around piles.
4. Loadout of aggregate for shipment or for return to the process stream (batch or continuous drop operations).

TABLE 11.2.3-1. TYPICAL SILT AND MOISTURE CONTENT VALUES OF MATERIALS AT VARIOUS INDUSTRIES

Industry	Material	Silt (%)			Moisture (%)		
		No. of test samples	Range	Mean	No. of test samples	Range	Mean
Iron and steel production[a]	Pellet ore	10	1.4 - 13	4.9	8	0.64 - 3.5	2.1
	Lump ore	9	2.8 - 19	9.5	6	1.6 - 8.1	5.4
	Coal	7	2 - 7.7	5	6	2.8 - 11	4.8
	Slag	3	3 - 7.3	5.3	3	0.25 - 2.2	0.92
	Flue dust	2	14 - 23	18.0	0	NA	NA
	Coke breeze	1		5.4	1		6.4
	Blended ore	1		15.0	1		6.6
	Sinter	1		0.7	0	NA	NA
	Limestone	1		0.4	0	NA	NA
Stone quarrying and processing[b]	Crushed limestone	2	1.3 - 1.9	1.6	2	0.3 - 1.1	0.7
Taconite mining and processing[c]	Pellets	9	2.2 - 5.4	3.4	7	0.05 - 2.3	0.96
	Tailings	2	NA	11.0	1		0.35
Western surface coal mining[d]	Coal	15	3.4 - 16	6.2	7	2.8 - 20	6.9
	Overburden	15	3.8 - 15	7.5	0	NA	NA
	Exposed ground	3	5.1 - 21	15.0	3	0.8 - 6.4	3.4

[a] References 2-5. NA = not applicable.
[b] Reference 1.
[c] Reference 6.
[d] Reference 7.

Adding aggregate material to a storage pile or removing it usually involves dropping the material onto a receiving surface. Truck dumping on the pile or loading out from the pile to a truck with a front end loader are examples of batch drop operations. Adding material to the pile by a conveyor stacker is an example of a continuous drop operation.

The quantity of particulate emissions generated by a batch drop operation, per ton of material transferred, may be estimated, with a rating of C, using the following empirical expression[2]:

$$E = k(0.00090)\ \frac{\left(\frac{s}{5}\right)\left(\frac{U}{2.2}\right)\left(\frac{H}{1.5}\right)}{\left(\frac{M}{2}\right)^2\left(\frac{Y}{4.6}\right)^{0.33}}\quad (\text{kg/Mg}) \qquad (1)$$

$$E = k(0.0018)\ \frac{\left(\frac{s}{5}\right)\left(\frac{U}{5}\right)\left(\frac{H}{5}\right)}{\left(\frac{M}{2}\right)^2\left(\frac{Y}{6}\right)^{0.33}}\quad (\text{lb/ton})$$

where: E = emission factor
k = particle size multipler (dimensionless)
s = material silt content (%)
U = mean wind speed, m/s (mph)
H = drop height, m (ft)
M = material moisture content (%)
Y = dumping device capacity, m^3 (yd^3)

The particle size multipler (k) for Equation 1 varies with aerodynamic particle size, shown in Table 11.2.3-2.

TABLE 11.2.3-2. AERODYNAMIC PARTICLE SIZE MULTIPLIER (k) FOR EQUATIONS 1 AND 2

Equation	< 30 µm	< 15 µm	< 10 µm	< 5 µm	< 2.5 µm
Batch drop	0.73	0.48	0.36	0.23	0.13
Continuous drop	0.77	0.49	0.37	0.21	0.11

The quantity of particulate emissions generated by a continuous drop operation, per ton of material transferred, may be estimated, with a rating of C, using the following empirical expression[3]:

$$E = k(0.00090)\ \frac{\left(\frac{s}{5}\right)\left(\frac{U}{2.2}\right)\left(\frac{H}{3.0}\right)}{\left(\frac{M}{2}\right)^2}\quad (\mathrm{kg/Mg}) \qquad (2)$$

$$E = k(0.0018)\ \frac{\left(\frac{s}{5}\right)\left(\frac{U}{5}\right)\left(\frac{H}{10}\right)}{\left(\frac{M}{2}\right)^2}\quad (\mathrm{lb/ton})$$

where: E = emission factor
k = particle size multiplier (dimensionless)
s = material silt content (%)
U = mean wind speed, m/s (mph)
H = drop height, m (ft)
M = material moisture content (%)

The particle size multiplier (k) for Equation 2 varies with aerodynamic particle size, as shown in Table 11.2.3-2.

Equations 1 and 2 retain the assigned quality rating if applied within the ranges of source conditions that were tested in developing the equations, as given in Table 11.2.3-3. Also, to retain the quality ratings of Equations 1 or 2 applied to a specific facility, it is necessary that reliable correction parameters be determined for the specific sources of interest. The field and laboratory procedures for aggregate sampling are given in Reference 3. In the event that site specific values for correction parameters cannot be obtained, the appropriate mean values from Table 11.2.3-1 may be used, but in that case, the quality ratings of the equations are reduced by one level.

TABLE 11.2.3-3. RANGES OF SOURCE CONDITIONS FOR EQUATIONS 1 AND 2[a]

Equation	Silt content (%)	Moisture content (%)	Dumping capacity m^3	Dumping capacity yd^3	Drop height m	Drop height ft
Batch drop	1.3 - 7.3	0.25 - 0.70	2.10 - 7.6	2.75 - 10	NA	NA
Continuous drop	1.4 - 19	0.64 - 4.8	NA	NA	1.5 - 12	4.8 - 39

[a] NA = not applicable.

For emissions from equipment traffic (trucks, front end loaders, dozers, etc.) traveling between or on piles, it is recommended that the equations for vehicle traffic on unpaved surfaces be used (see Section 11.2.1). For vehicle travel between storage piles, the silt value(s) for the areas among the piles (which may differ from the silt values for the stored materials) should be used.

For emissions from wind erosion of active storage piles, the following total suspended particulate (TSP) emission factor equation is recommended:

$$E = 1.9 \left(\frac{s}{1.5}\right) \left(\frac{365-p}{235}\right) \left(\frac{f}{15}\right) \text{ (kg/day/hectare)} \qquad (3)$$

$$E = 1.7 \left(\frac{s}{1.5}\right) \left(\frac{365-p}{235}\right) \left(\frac{f}{15}\right) \text{ (lb/day/acre)}$$

where: E = total suspended particulate emission factor
s = silt content of aggregate (%)
p = number of days with $\geq$ 0.25 mm (0.01 in.) of precipitation per year
f = percentage of time that the unobstructed wind speed exceeds 5.4 m/s (12 mph) at the mean pile height

The coefficient in Equation 3 is taken from Reference 1, based on sampling of emissions from a sand and gravel storage pile area during periods when transfer and maintenance equipment was not operating. The factor from Test Report 1, expressed in mass per unit area per day, is more reliable than the factor expressed in mass per unit mass of material placed in storage, for reasons stated in that report. Note that the coefficient has been halved to adjust for the estimate that the wind speed through the emission layer at the test site was one half of the value measured above the top of the piles. The other terms in this equation were added to correct for silt, precipitation and frequency of high winds, as discussed in Reference 2. Equation 3 is rated C for application in the sand and gravel industry and D for other industries.

Worst case emissions from storage pile areas occur under dry windy conditions. Worst case emissions from materials handling (batch and continuous drop) operations may be calculated by substituting into Equations 1 and 2 appropriate values for aggregate material moisture content and for anticipated wind speeds during the worst case averaging period, usually 24 hours. The treatment of dry conditions for vehicle traffic (Section 11.2.1) and for wind erosion (Equation 3), centering around parameter p, follows the methodology described in Section 11.2.1. Also, a separate set of nonclimatic correction parameters and source extent values corresponding to higher than normal storage pile activity may be justified for the worst case averaging period.

11.2.3.4 Control Methods

Watering and chemical wetting agents are the principal means for control of aggregate storage pile emissions. Enclosure or covering of inactive piles to reduce wind erosion can also reduce emissions. Watering is useful mainly to reduce emissions from vehicle traffic in the storage pile area. Watering of the storage piles themselves typically has only a very temporary slight effect on total emissions. A much more effective technique is to apply chemical wetting agents for better wetting of fines and longer retention of the moisture film. Continuous chemical treatment of material loaded onto piles, coupled with watering or treatment of roadways, can reduce total particulate emissions from aggregate storage operations by up to 90 percent.[8]

References for Section 11.2.3

1. C. Cowherd, Jr., et al., Development of Emission Factors for Fugitive Dust Sources, EPA-450/3-74-037, U. S. Environmental Protection Agency, Research Triangle Park, NC, June 1974.

2. R. Bohn, et al., Fugitive Emissions from Integrated Iron and Steel Plants, EPA-600/2-78-050, U. S. Environmental Protection Agency, Research Triangle Park, NC, March 1978.

3. C. Cowherd, Jr., et al., Iron and Steel Plant Open Dust Source Fugitive Emission Evaluation, EPA-600/2-79-103, U. S. Environmental Protection Agency, Research Triangle Park, NC, May 1979.

4. R. Bohn, Evaluation of Open Dust Sources in the Vicinity of Buffalo, New York, U. S. Environmental Protection Agency, New York, NY, March 1979.

5. C. Cowherd, Jr., and T. Cuscino, Jr., Fugitive Emissions Evaluation, Equitable Environmental Health, Inc., Elmhurst, IL, February 1977.

6. T. Cuscino, et al., Taconite Mining Fugitive Emissions Study, Minnesota Pollution Control Agency, Roseville, MN, June 1979.

7. K. Axetell and C. Cowherd, Jr., Improved Emission Factors for Fugitive Dust from Western Surface Coal Mining Sources, 2 Volumes, EPA Contract No. 68-03-2924, PEDCo Environmental, Inc., Kansas City, MO, July 1981.

8. G. A. Jutze, et al., Investigation of Fugitive Dust Sources Emissions and Control, EPA-450/3-74-036a, U. S. Environmental Protection Agency, Research Triangle Park, NC, June 1974.

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TABLE 2.2-1

ANNUAL PERCENTAGE FREQUENCY OF WIND BY SPEED GROUPS AND THE MEAN SPEED

STATE AND STATION	0 - 3 m.p.h.	4 - 7 m.p.h.	8 - 12 m.p.h.	13 - 18 m.p.h.	19 - 24 m.p.h.	25 - 31 m.p.h.	32 - 38 m.p.h.	39 - 46 m.p.h.	47 m.p.h. and over	Mean speed m.p.h.
ALA. Birmingham	27	22	30	17	3	1	•	•	•	7.9
Mobile	7	28	38	20	6	1	•	•	•	10.0
Montgomery	31	29	27	12	2	•	•			6.9
ALASKA, Anchorage	28	35	25	11	2	•	•	•		6.8
Cold Bay	4	9	18	27	21	14	5	2	•	17.4
Fairbanks	40	35	19	5	1	•	•	•		5.2
King Salmon	11	20	30	24	10	4	1	•	•	11.4
ARIZ. Phoenix	38	36	20	5	1	•	•	•		5.4
Tucson	18	35	30	14	3	1	•	•		8.1
ARK. Little Rock	12	30	39	18	2	•	•	•		8.7
CALIF. Bakersfield	35	30	24	10	1	•	•			5.8
Burbank	52	26	18	4	1	•	•	•		4.5
Fresno	30	41	22	7	1	•	•			6.1
Los Angeles	28	33	27	11	1	•	•			6.8
Oakland	26	28	28	16	2	1	•	•	•	7.5
Sacramento	15	28	31	18	5	1	•	•	•	9.3
San Diego	28	38	28	6	•	•	•			6.3
San Francisco	16	21	26	22	11	3	•	•	•	10.6
COLO. Colorado Springs	9	27	38	19	6	2	•	•	•	10.0
Denver	11	27	34	22	5	2	•	•	•	10.0
CONN. Hartford	13	26	32	24	6	1	•	•	•	9.8
D.C. Washington	11	28	35	22	5	1	•	•	•	9.7
DEL. Wilmington	15	31	30	19	4	1	•	•	•	8.8
FLA. Jacksonville	10	33	35	18	3	•	•	•		8.9
Miami	14	30	34	20	2	•	•	•	•	8.8
Orlando	18	28	32	17	4	•	•	•		8.8
Tallahassee	33	36	23	7	•	•				6.1
Tampa	9	31	40	16	2	•	•	•	•	8.8
West Palm Beach	9	22	36	27	6	1	•	•		10.5
GA. Atlanta	13	24	36	21	6	1	•	•		9.7
Augusta	36	29	25	9	1	•	•			6.3
Macon	10	26	46	18	2	•	•	•	•	8.9
Savannah	12	34	37	14	3	•	•	•	•	8.4
HAWAII, Hilo	7	34	43	15	2	•	•			8.7
Honolulu	9	17	27	32	12	2	•	•	•	12.1
IDAHO, Boise	15	30	32	18	4	1	•	•		8.9
ILL. Chicago (O'Hare)	8	22	33	27	8	2	•	•	•	11.2
Chicago (Midway)	7	26	36	25	5	1	•	•	•	10.2
Moline	14	23	32	24	7	2	•	•	•	10.0
Springfield	7	22	28	27	12	3	1	•	•	12.0
IND. Evansville	19	23	32	21	5	1	•	•		9.1
Fort Wayne	9	23	33	25	8	2	•	•	•	10.9
Indianapolis	9	22	34	26	7	2	•	•	•	10.8
South Bend	7	21	35	30	7	1	•	•		10.9
IOWA, Des Moines	3	17	38	29	10	3	1	•	•	12.1
Sioux City	10	20	31	25	10	4	1	•	•	11.7
KANS. Topeka	11	19	30	27	10	2	•	•	•	11.2
Wichita	4	12	30	31	16	5	1	•	•	13.7
KY. Lexington	8	25	39	22	6	1	•	•		10.1
Louisville	17	28	31	20	3	1	•	•		8.8
LA. Baton Rouge	17	29	34	17	3	•	•	•		8.3
Lake Charles	19	31	29	17	4	1	•	•	•	8.5
New Orleans	16	27	32	19	5	1	•	•	•	9.0
Shreveport	12	26	37	21	4	1	•	•	•	9.5
MAINE, Portland	10	30	33	22	4	1	•	•	•	9.6
MD. Baltimore	7	24	39	22	6	2	•	•	•	10.4
MASS. Boston	3	12	33	35	12	4	1	•	•	13.3
MICH. Detroit (City AP)	8	23	37	26	5	1	•	•	•	10.3
Flint	16	26	32	22	3	1	•	•	•	9.0
Grand Rapids	14	23	32	25	5	1	•	•	•	9.8
MINN. Duluth	6	15	33	31	11	4	1	•	•	12.6
Minneapolis	8	21	34	28	9	2	•	•	•	11.2
MISS. Jackson	33	25	26	14	2	•	•	•		7.1
MO. Kansas City	9	29	35	23	5	1	•			9.8
St. Louis	10	29	36	21	3	1	•	•	•	9.3
Springfield	4	13	34	32	13	3	1	•	•	12.9
MONT. Great Falls	7	19	24	24	15	9	3	1	•	13.9
NEBR. Omaha	12	17	29	28	11	3	•	•		11.6
NEV. Las Vegas	18	26	25	20	8	3	1	•	•	9.7
Reno	52	20	13	10	4	1	•	•	•	5.9
N. J. Newark	11	25	34	24	5	1	•	•	•	9.8
N. MEX. Albuquerque	17	36	26	13	5	2	•	•	•	8.6
N. Y. Albany	23	24	27	21	4	1	•	•		8.6
Binghamton	11	23	35	25	5	1	•	•	•	10.0
Buffalo	5	17	34	27	13	3	1	•	•	12.4
New York (Kennedy)	6	17	35	28	10	3	•	•	•	12.0
New York (La Guardia)	6	15	30	31	12	4	1	•	•	12.9
Rochester	8	22	34	25	9	2	1	•	•	11.2
Syracuse	14	27	30	23	5	1	•	•	•	9.7
N. C. Charlotte	20	32	31	14	2	•	•	•		7.9
Greensboro	20	32	31	14	2	•	•	•	•	8.0
Raleigh	18	33	34	14	2	•	•	•	•	7.7
Winston-Salem	19	22	33	21	4	1	•	•		9.0
N. DAK. Bismarck	14	20	27	24	12	3	1	•	•	11.2
Fargo	4	13	28	31	15	7	2	•	•	14.4
OHIO, Akron-Canton	7	25	35	26	5	1	•	•	•	10.4
Cincinnati	11	27	38	22	4	1	•	•	•	9.6
Cleveland	7	18	35	29	9	2	•	•	•	11.6
Columbus	26	23	29	18	4	1	•	•	•	8.2
Dayton	8	25	36	23	6	2	•	•	•	10.3
Youngstown	7	26	36	24	6	1	•	•	•	10.3
OKLA. Oklahoma City	2	11	34	34	13	6	1	•	•	14.0
OKLA. (Cont.) Tulsa	9	24	34	26	7	1	•	•	•	10.6
OREG. Medford	47	31	14	6	2	•	•	•	•	4.6
Portland	28	27	25	16	4	1	•	•	•	7.7
Salem	25	32	28	13	2	•	•			7.1
PA. Harrisburg	28	31	25	13	3	1	•	•		7.3
Philadelphia	11	27	35	21	5	1	•	•	•	9.6
Pittsburgh	12	26	34	22	4	1	•	•		9.4
Scranton	11	33	35	18	2	•	•	•		8.8
R. I. Providence	11	20	32	28	7	2	•	•	•	10.7
S. C. Charleston	12	28	35	19	4	1	•	•		9.2
Columbia	25	35	26	12	2	•	•			7.0
S. DAK. Huron	10	18	29	29	10	3	1	•	•	11.9
Rapid City	15	22	28	21	10	4	1	•	•	11.0
TENN. Chattanooga	39	25	24	11	1	•	•			6.1
Knoxville	29	29	25	12	4	1	•	•	•	7.5
Memphis	14	26	34	20	5	1	•	•		9.4
Nashville	27	31	25	14	2	•	•	•	•	7.2
TEX. Amarillo	5	15	32	32	12	4	1	•	•	12.9
Austin	13	25	34	23	5	1	•	•		9.7
Brownsville	10	17	25	30	14	3	•	•	•	12.3
Corpus Christi	11	16	26	33	12	2	•	•		11.9
Dallas	9	21	32	28	9	1	•	•		11.0
El Paso	10	22	32	22	9	4	1	•	•	11.3
Ft. Worth	4	14	34	34	10	3	•	•	•	12.5
Galveston	4	13	39	33	10	2	1	•	•	12.5
Houston	6	18	36	28	10	2	•	•	•	11.8
Laredo	6	15	32	34	12	1	•	•		12.3
Lubbock	4	11	33	34	13	5	1	•	•	13.6
Midland	9	22	38	26	4	1	•	•		10.1
San Antonio	18	23	32	22	4	1	•	•		9.3
Waco	3	14	36	35	10	2	•	•		12.5
Wichita Falls	5	22	41	27	5	1	•	•	•	10.5
UTAH, Salt Lake City	12	33	36	14	4	1	•	•	•	8.7
VT. Burlington	24	24	28	22	2	•	•			8.3
VA. Norfolk	14	23	30	25	6	1	•	•	•	10.2
Richmond	14	37	36	11	1	•	•	•		7.8
Roanoke	31	22	23	17	5	2	•	•		8.3
WASH. Seattle-Tacoma AP	13	16	35	26	8	2	•	•	•	10.7
Spokane	17	38	27	14	3	1	•	•		8.1
W. VA. Charleston	29	37	25	8	1	•	•			6.2
WIS. Green Bay	8	22	32	26	10	2	•	•	•	11.2
Madison	15	22	30	23	7	2	•	•	•	10.1
Milwaukee	8	17	31	30	11	3	1	•	•	12.1
WYO. Casper	8	16	27	27	13	7	2	•	•	13.3
PACIFIC, Wake Island	1	6	27	48	17	2	•	•		14.4
P. R. San Juan	15	28	27	25	4	•	•	•	•	9.1

Source: Climatography of the United States Series 82; Decennial Census of the United States Climate -- Summary of Hourly Observations, 1951-60 (Table B)

PB89-135644

Toxic Air Pollutant Emission Factors
A Compilation for Selected Air Toxic Compounds and Sources

Radian Corp., Research Triangle Park, NC

Prepared for

Environmental Protection Agency
Research Triangle Park, NC

Oct 88

INDUSTRIAL PROCESS	SIC CODE	EMISSION SOURCE	SCC	POLLUTANT	CAS NUMBER	EMISSION FACTOR	NOTES	REFERENCE
process								
Cement manufacture - wet process	3241	Raw mill	305006	Cadmium	7440439	2 x 10E-5 lb/ton feed	Controlled with baghouse	38
Cement manufacture - wet process	3241	Clinker cooler	305006	Cadmium	7440439	1 x 10E-5 lb/ton feed	Controlled with ESP or baghouse	38
Cement manufacture - wet process	3241	Dryers and grinders	305007	Manganese	7439965	16 lb/10E3 tons cement produced	Uncontrolled, calculated based on engineering judgement	107
Cement manufacture - wet process	3241	Kilns	30500706	Manganese	7439965	114 lb/10E3 tons cement produced	Uncontrolled, calculated based on engineering judgement	107
Cement manufacture - wet process	3241	Kilns	30500706	Manganese	7439965	0.02-0.142 lb/10E3 tons cement produced	Controlled by ESP, calculated based on engineering judgement	107
Cement manufacture - wet process	3241	Kilns	30500706	Manganese	7439965	0.049-0.132 lb/10E3 tons cement produced	Controlled by fabric filter, calculated based on engineering judgement	107
Cement manufacture - wet process	3241	Kiln	30500706	Nickel	7440020	0.2-2 lb/1000 tons raw mater. feed input	Controlled by fabric filter, based on source tests	110
Cement manufacture - wet process	3241	Kiln	30500706	Beryllium	7440417	0.002 lb/ton produced	Engineering judgement	113
Cement manufacture - wet process	3241	Kiln	30500706	Chromium	7440473	12 kg/1000 Mg cement produced	Uncontrolled, includes fuel emissions, as total chromium	161
Cement manufacture - wet process	3241	Kiln	30500706	Chromium	7440473	0.011 kg/1000 Mg cement produced	ESP, includes fuel emissions, as total chromium	161
Cement manufacture - wet process	3241	Kiln	30500706	Chromium	7440473	0.008 kg/1000 Mg cement produced	Fabric filter, includes fuel emissions, as total chromium	161
Cement manufacture - wet process	3241	Clinker cooler	30500714	Nickel	7440020	0.004 lb/1000 tons raw mater. feed input	Controlled by fabric filter, based on source tests	110
Cement manufacture - wet process	3241	Clinker cooler	30500714	Nickel	7440020	0.1 lb/1000 tons raw mater. feed input	Controlled by ESP, based on source tests	110
Cement manufacture - wet process	3241	Clinker cooler	30500714	Nickel	7440020	0.2 lb/1000 tons raw mater. feed input	Controlled by two fabric filters in parallel, based on source tests	110
Cement manufacture - wet process	3241	Clinker cooler	30500714	Beryllium	7440417	0.0008 lb/ton produced	ESP control	113

APPENDIX B

FUGITIVE DUST EMISSION ESTIMATES

B.1 DESCRIPTION OF COAL HANDLING SYSTEM

B.1.1 EXISTING COAL HANDLING SYSTEM

At the existing coal handling facilities at Tarmac, coal is received via 100-ton railcars and bottom-dumped onto the ground from an elevated trestle. A temporary storage pile is formed under the trestle unloading area. A front-end loader (FEL) of 7 yd^3 capacity is used to move coal from temporary storage to the active coal storage pile for the facility. Current active storage amounts to approximately 1.0 acres. From the active storage pile, a FEL of 7 yd^3 capacity is used to move coal from the active storage pile to the loading hopper.

From the loading hopper onward, all conveyor transfer points, the bucket elevator, the storage bin, the coal mills and other equipment are enclosed and controlled by baghouses. These baghouses are permitted under the current operating permit (A013-157297). A flow diagram of the existing coal preparation facilities is presented in Figure B-1.

B.1.2 PROPOSED FACILITIES FOR KILN 2

No changes will be made in the existing coal receiving and storage facilities to accommodate Kiln 2. The Kiln 2 coal conversion will result in a maximum increase of 56,940 TPY of coal processed through the facilities. This will result in increased tonnage moved by the FELs, and will increase storage pile size by approximately 0.3 acres.

From the existing loading hopper through to the existing coal bin, increased throughput will occur, which will increase the annual operating hours of three baghouses controlling these points (G-509, G-521 and G-527). Operating hours will increase from about 10 hr/day to a maximum of 16 hr/day (increase of 2,040 hr/yr at 340 day/yr operation). The maximum particulate emissions from the three baghouses, based upon the air flow rates of 4,000, 6000, and 4,000 acfm, respectively, and 0.01 gr/dscf particulate loading, are 0.34 lb/hr, 0.51 lb/hr, and 0.34 lb/hr, respectively. This results in an increase in particulate emissions of

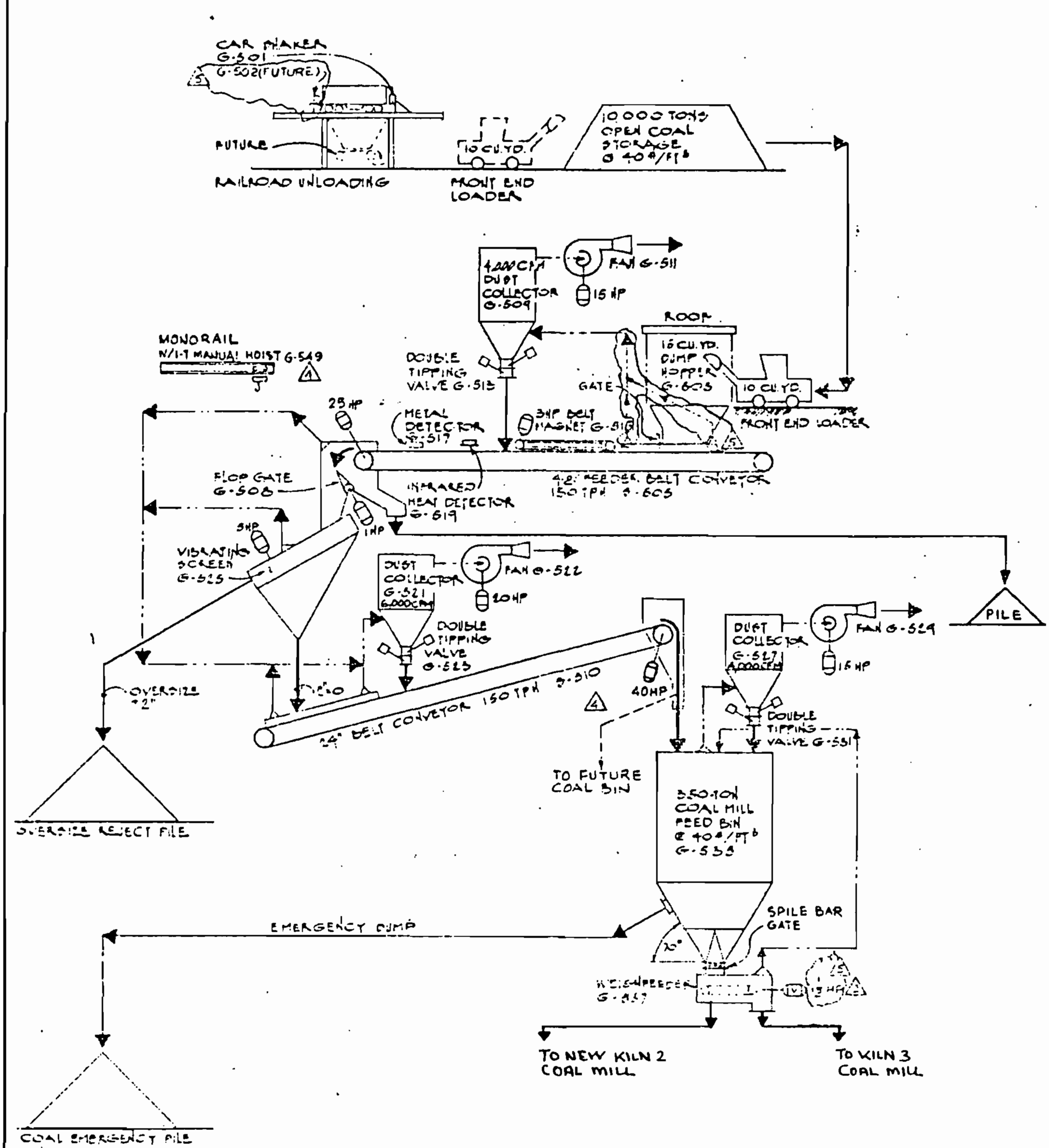

Figure B-1 FLOW DIAGRAM OF COAL PREPARATION SYSTEM

KBN

0.35 TPY , 0.52 TPY, and 0.35 TPY for the three baghouses (total increase of 1.21 TPY). These particulate emissions are assumed to be all PM10.

A new rotary conveyor will be constructed to convey coal for Kiln 2 from the existing coal bin to the new coal mill. This will be a totally enclosed conveyor, and no emissions will result. Hot air from the clinker cooler will provide drying of the coal in the mill, and will also convey the coal to the kiln. Thus, there will be no particulate emissions from the new coal mill.

B.2 FUGITIVE DUST EMISSION ESTIMATES

Fugitive dust emissions from the coal handling operations at Tarmac were estimated using the generalized fugitive dust emission factor equations contained in USEPA Publication AP-42, Section 11.2.3, Aggregate Handling and Storage Piles (10/86), and Section 11.2.1, Unpaved Roads (9/85). These sections contain emission factors for the following types of emission sources associated with the Tarmac operations:

* Batch drop operation
* Wind erosion from storage piles
* Vehicular traffic in the storage pile area

A. <u>COAL TRANSFER OPERATIONS</u>

The coal transfer operations at Tarmac consist of the railcar dump; transfer from the temporary storage pile to the active storage pile and; transfer from active storage pile to the loading hopper. These operations are all batch drop operations. The AP-42 factor for a batch drop operation is as follows:

$$E = k\,(0.0018)\;\frac{\left(\frac{s}{5}\right)\left(\frac{U}{5}\right)\left(\frac{H}{5}\right)}{\left(\frac{M}{2}\right)^{2}\left(\frac{Y}{6}\right)^{0.33}}\ \text{lb/ton}$$

where,
- E = emission factor
- k = particle size multiplier
- s = material silt content (%)
- U = mean wind speed (mph)
- H = drop height (ft)
- M = material moisture content (%)
- Y = dumping device capacity (yd^3)

The particle size multiplier, k, is 1.0 for total suspended particulate [PM(TSP)]. The coal moisture content (M) was based on periodic sampling by Tarmac which shows an average moisture content of 7.2 percent. The silt content (s) of coal was obtained from Section 11.2.3 of AP-42, which showed an average of 5% for silt. The mean wind speed, U, in Miami is 8.8 mph, based upon a 9-year average. This average wind speed was used in the annual emission estimates. A higher wind speed of 18 mph was used for worst case daily emission estimates. This wind speed is exceeded only 2% of the time in Miami. The drop height varies for the transfer points, resulting in different emission factors. The resulting emission factors for each operation, and annual and worst case daily emission rates, are presented in Tables B-1 and B-2.

The current maximum daily delivery of coal to the site is 2,000 tons (20 rail cars). After conversion of Kiln 2 to coal, this maximum daily tonnage will not increase. Only the frequency of coal deliveries to the site will increase.

B. <u>WIND EROSION</u>

The recommended AP-42 emission factor equation for wind erosion from active storage piles is as follows:

$$E = 1.7\ (s/1.5)\ [(365-p)/235]\ (f/15)$$

where,
- E = total suspended particulate emission factor (lb/acre/day)
- s = silt content (%)
- p = number of days with precipitation greater than 0.01 inches
- f = percentage of time that winds exceed 12 mph

Table B-1. Tarmac Kiln 2 Annual Particulate Matter (TSP) Emissions Increase

SOURCE	TYPE	s SILT CONTENT (%)	M MOISTURE CONTENT (%)	U WIND SPEED (MPH)	H DROP HEIGHT (FT)	Y DEVICE CAPACITY (YD**3)	E EMISSION FACTOR (LB/TON)
1) RAILCAR UNLOADING	BATCH DROP	5	7.2	8.8	20	87.0	0.00040
2) FEL-TO-PILE	BATCH DROP	5	7.2	8.8	10	7.0	0.00046
3) FEL-TO-LOADING HOPPER	BATCH DROP	5	7.2	8.8	10	7.0	0.00046
4) ACTIVE COAL PILE	WIND EROSION	5	-	-	-	-	*
5) ACTIVE COAL PILE	VEHICULAR TRAFFIC	5	-	-	-	-	*
6) BAGHOUSE G-509	BAGHOUSE	-	-	-	-	-	*
7) BAGHOUSE G-521	BAGHOUSE	-	-	-	-	-	*
8) BAGHOUSE G-527	BAGHOUSE	-	-	-	-	-	*

ANNUAL EMISSION ESTIMATES

SOURCE	UNCONTROLLED EMISSION FACTOR (LB/TON)	ANNUAL THRUPUT (TPY)	ANNUAL EMISSIONS (TPY)
1) RAILCAR UNLOADING	0.00040	56,940	0.012
2) FEL-TO-PILE	0.00046	56,940	0.013
3) FEL-TO-LOADING HOPPER	0.00046	56,940	0.013
4) ACTIVE COAL PILE (WIND)	*	*	0.480
5) ACTIVE COAL PILE (TRAFFIC)	*	56,940	10.230
6) BAGHOUSE G-509	*	56,940	0.35
7) BAGHOUSE G-521	*	56,940	0.52
8) BAGHOUSE G-527	*	56,940	0.35

		TOTAL ANNUAL EMISSIONS =	11.97

* REFER TO TEXT FOR EMISSION FACTORS OR BASIS OF EMISSIONS

Table B-2. Tarmac Kiln 2 Maximum 24-Hour Particulate Matter (TSP) Emission Increases

SOURCE	TYPE	s SILT CONTENT (%)	M MOISTURE CONTENT (%)	U WIND SPEED (MPH)	H DROP HEIGHT (FT)	Y DEVICE CAPACITY (YD**3)	E EMISSION FACTOR (LB/TON)
1) RAILCAR UNLOADING	BATCH DROP	5	7.2	18	20	87.0	0.00083
2) FEL-TO-PILE	BATCH DROP	5	7.2	18	10	7.0	0.00095
3) FEL-TO-LOADING HOPPER	BATCH DROP	5	7.2	18	10	7.0	0.00095
4) ACTIVE COAL PILE	WIND EROSION	5	-	-	-	-	*
5) ACTIVE COAL PILE	VEHICULAR TRAFFIC	5	-	-	-	-	*
6) BAGHOUSE G-509	BAGHOUSE	-	-	-	-	-	*
7) BAGHOUSE G-521	BAGHOUSE	-	-	-	-	-	*
8) BAGHOUSE G-527	BAGHOUSE	-	-	-	-	-	*

24-HOUR EMISSION ESTIMATES

SOURCE	UNCONTROLLED EMISSION FACTOR (LB/TON)	MAXIMUM 24-HOUR THRUPUT (TONS/DAY)	MAXIMUM 24-HOUR EMISSIONS (LB/DAY)
1) RAILCAR UNLOADING	0.00083	+	+
2) FEL-TO-PILE	0.00095	+	+
3) FEL-TO-LOADING HOPPER	0.00095	156	0.15
4) ACTIVE COAL PILE (WIND)	*	*	8.80
5) ACTIVE COAL PILE (TRAFFIC)	*	156	46.50
6) BAGHOUSE G-509	*	6 HR/DAY	2.04
7) BAGHOUSE G-521	*	6 HR/DAY	3.06
8) BAGHOUSE G-527	*	6 HR/DAY	2.04

		TOTAL 24-HOUR EMISSIONS =	62.59

* REFER TO TEXT FOR EMISSION FACTORS

\+ THERE WILL BE NO INCREASE IN MAXIMUM DAILY COAL UNLOADING RATE

As described above, the silt content of coal is taken to be 5%. The number of days in Miami with precipitation greater than 0.01 inches is approximately 120, and the percentage of time that the winds exceed 12 mph is 22%. Substituting these values into the above equation yields the following:

$$E = 1.7 \times (5/1.5) \times [(365-120)/235] \times (22/15) = 8.7 \text{ lb/acre/day}$$

The active coal pile at Tarmac will increase by approximately 0.3 acres. This results in the following annual average PM(TSP) emissions due to the increased storage pile area:

$$0.3 \text{ acres} \times 8.7 \text{ lb/acre/day} \times 365 \text{ days/yr} / 2{,}000 \text{ lb/ton} = 0.48 \text{ TPY}$$

For a worst case daily estimation, no precipitation was assumed, and the frequency of high winds greater than 12 mph was assumed to be 50% (i.e. half of the day). This yields the following emission factor and worst case daily emission rate:

$$E = 1.7 \times (5/1.5) \times [(365-0)/235] \times (50/15) = 29.3 \text{ lb/acre/day}$$
$$0.3 \text{ acres} \times 29.3 \text{ lb/acre/day} = 8.8 \text{ lb/day}$$

These emission rates are summarized in Tables B-1 and B-2.

C. <u>VEHICULAR TRAFFIC</u>

AP-42 recommends the use of the emission factor for unpaved roads (Section 11.2.1) for estimating fugitive emissions due to vehicular traffic in and around storage piles. The equation is as follows:

$$E = k\ (5.9)\ (s/12)\ S/30)\ (W/3)^{0.7}\ (w/4)^{0.5}\ [(365-p)/365]$$

where, E = particulate emission factor (lb/mile)
k = 1.0 for total suspended particulate matter
s = silt content of road surface material (%)
S = mean vehicle speed (mph)
W = mean vehicle weight (tons)
w = mean number of wheels
p = number of days with precipitation greater than 0.01 inches

For the Tarmac operation,

s = 15% (assumed to be three times that of coal silt content)
S = 10 mph
W = 55.0 tons (loaded weight)
= 47.5 tons (empty weight)
w = 4
p = 120

Substituting these values into the emission factor equation yields the following:

$$E = 1.0\ (5.9)\ (15/12)\ (10/30)\ (55/3)^{0.7}\ (4/4)^{0.5}\ [(365\text{-}120)/365]$$
$$= 12.6 \text{ lb/mile (loaded)}$$
$$E = 1.0\ (5.9)\ (15/12)\ (10/30)\ (47.5/3)^{0.7}\ (4/4)^{0.5}\ [(365\text{-}120)/365]$$
$$= 11.4 \text{ lb/mile (empty)}$$

For worst case daily conditions, the emission factor was adjusted for no precipitation:

$$E = 1.0\ (5.9)\ (15/12)\ (10/30)\ (55/3)^{0.7}\ (4/4)^{0.5}\ [(365\text{-}0)/365]$$
$$= 18.8 \text{ lb/mile (loaded)}$$
$$E = 1.0\ (5.9)\ (15/12)\ (10/30)\ (47.5/3)^{0.7}\ (4/4)^{0.5}\ [(365\text{-}120)/365]$$
$$= 17.0 \text{ lb/mile (empty)}$$

The frontend loader has a payload capacity of 8 tons. In order to load the maximum annual coal thruput of 56,940 tons for Kiln 2 would require 7,118 trips. The travel distance from the rail car unloading area to the coal pile is about 250 feet, and from the coal pile to the unloading hopper is about 300 feet. Total one-way distance is 550 feet or 741 miles annually. This annual mileage was increased by 15% to account for additional travel due to pile maintenance activities, i.e., 852 mi/yr. Resulting annual emissions are as follows:

Loaded: 852 mi/yr x 12.6 lb/mile / 2,000 lb/ton = 5.37 TPY
Empty: 852 mi/hr x 11.4 lb/mile / 2,000 lb/ton = 4.86 TPY

As described previously, the maximum daily amount of coal delivered to the site will not increase. However, additional loading of coal from the coal pile to the loading hopper will increase by 6.5 TPH or 156 tons per day. This rate requires 23 trips per day, or 1.3 miles one-way travel distance.

Worst case daily emissions are:

Loaded: 1.3 miles x 18.8 lb/mile = 24.4 lb/day

Empty: 1.3 miles x 17.0 lb/mile = 22.1 lb/day

D. PARTICULATE EMISSION SUMMARY

Particulate emission estimates for the Tarmac coal handling operations are summarized in Tables B-1, B-2 and B-3. These emissions represent the increase in particulate emissions due to the Kiln 2 coal conversion. As shown in Tables B-1 and B-2, annual emissions of PM(TSP) are estimated at 11.97 TPY, and worst case daily emissions are 62.6 lb/day. Based on particle site data developed by EPA, PM10 particle size multipliers and PM(TSP) estimates are shown in Table B-3. The PM10 emissions increase is 5.40 TPY annually, and 32.7 lb/day, maximum.

TARPM10
8/28/89

Table B-3. Tarmac Kiln 2 PM10 Emissions Increase

ANNUAL PM10 EMISSION ESTIMATES

SOURCE	TYPE OPERATION	ANNUAL PM(TSP) EMISSIONS (TPY)	PM10 PARTICLE SIZE MULTIPLIER	ANNUAL PM10 EMISSIONS (TPY)
1) RAILCAR UNLOADING	BATCH DROP	0.012	0.36	0.0043
2) FEL-TO-PILE	BATCH DROP	0.013	0.36	0.0047
3) FEL-TO-LOADING HOPPER	BATCH DROP	0.013	0.36	0.0047
4) ACTIVE COAL PILE	WIND EROSION	0.480	1.00	0.4800
5) ACTIVE COAL PILE	VEHICULAR TRAFFIC	10.230	0.36	3.6828
6) BAGHOUSE G-509	BAGHOUSE	0.35	1.00	0.3500
7) BAGHOUSE G-521	BAGHOUSE	0.52	1.00	0.5200
8) BAGHOUSE G-527	BAGHOUSE	0.35	1.00	0.3500
		------		------
	TOTAL ANNUAL EMISSIONS =	11.97		5.40

24-HOUR PM10 EMISSION ESTIMATES

SOURCE	TYPE OPERATION	MAXIMUM 24-HOUR PM EMISSIONS (lb/day)	PM10 PARTICLE SIZE MULTIPLIER	MAXIMUM 24-HOUR PM10 EMISSIONS (lb/day)
1) RAILCAR UNLOADING	BATCH DROP	0.00	0.36	0.00
2) FEL-TO-PILE	BATCH DROP	0.00	0.36	0.00
3) FEL-TO-LOADING HOPPER	BATCH DROP	0.15	0.36	0.05
4) ACTIVE COAL PILE	WIND EROSION	8.80	1.00	8.80
5) ACTIVE COAL PILE	VEHICULAR TRAFFIC	46.50	0.36	16.74
6) BAGHOUSE G-509	BAGHOUSE	2.04	1.00	2.04
7) BAGHOUSE G-521	BAGHOUSE	3.06	1.00	3.06
8) BAGHOUSE G-527	BAGHOUSE	2.04	1.00	2.04
		------		------
	TOTAL 24-HOUR EMISSIONS =	62.59		32.73

METRO-DADE DERM

(Department of Environmental Resources Management)
ENFORCEMENT SECTION

33 SOUTHWEST 2ND AVENUE
MIAMI, FL 33130-1540
(305) 372-6902

FAX COVER SHEET

DATE: 10/6/97 TIME: 3:30 AM/PM

TO: Al Linero DEP PH#:

FAX: 850 ~~488~~ 922-6979

FROM: Sharon Crabtree DERM FAX: 305-372-6542
PH#: 305-37~~2~~-6902

RE:

Number of pages including cover sheet: 12

MESSAGE: Al FYI. This is what Tarmac Consent Agreement looks like. We are mailing it 10/7/97 to Tarmac Reps for Review, & Signature. Sharon Crabtree
P.S. I left off Exhibit A - you have that - it is their permit AC 13-169901.

AGREEMENT

DADE COUNTY DEPARTMENT OF)
ENVIRONMENTAL RESOURCES MANAGEMENT)
Complainant,)
)
vs.)
Tarmac Florida, Inc.)
Respondent)
)

THIS AGREEMENT, entered into by and between METROPOLITAN DADE COUNTY DEPARTMENT OF ENVIRONMENTAL RESOURCES MANAGEMENT (hereinafter referred to as DERM), and Tarmac Florida, Inc. (hereinafter referred to as Respondent) pursuant to Section 24-5(15)(c) Metropolitan Dade County Environmental Protection Ordinance shall serve to redress alleged violations of Section 24-55 of the Code of Metropolitan Dade County at the site located at 11000 NW 121 Way, Medley, Dade County, Florida (Folio #30-2031-001-0030).

The DERM finds and RESPONDENT admits the following:

FINDINGS OF FACT

1. The DERM is an agency of Metropolitan Dade County, a political subdivision of the State of Florida which is empowered to control and prohibit pollution and protect the environment within Dade County pursuant to Article VIII, Section 6 of the Florida Constitution, the Dade County Home Rule Charter and Section 403.182 of the Florida Statutes.

2. On July 8, 1980 the United States Environmental Protection Agency (EPA) issued Final Determination PSD-F1-050 for proposed conversions of the Pennsuco kilns 1,2 and 3 to coal. Condition # 8 of the Final Determination limits NOx emissions from kiln # 2 to 118 lb/hr at the maximum operating rate or 4.73 lb/ton of clinker produced at lesser operating rates. These limiting emission rates were proposed by Respondent.

3. The conversion to coal for kiln # 2 was deferred for several years. On August 21, 1989 Respondent submitted an application to the Florida Department of Environmental Regulation (FDER, now known as the Florida Department of Environmental Protection, DEP) to construct/operate an air pollution source. In this application Respondent requested, a maximum allowable NOx emission rate of 169.25 lbs/hr for kiln #2.

4. On February 25, 1991 DEP issued Construction Permit No. AC 13-169901 (exhibit A, attached) to convert kiln #2 to coal firing. Specific Condition # 5 limited NOx emissions to 113.8 lbs/hr. Specific Condition # 12 permitted up to a one year compliance testing period. As stipulated in Condition # 12, during this year-long testing and evaluation period, Respondent was to make reasonable efforts to limit air emissions and DEP would not initiate enforcement proceedings.

5. On April 24, 1994 Respondent initiated the bi-monthly compliance testing for a one year period ending April 1995. NOx emissions exceeded permittable levels at every testing event through to the present. However, through NOx emission testing data, Respondent has demonstrated the ability to limit NOx emissions to below 200 lbs/hr using the existing system.

6. On May 28, 1996 Respondent's consulting firm submitted a plan for testing NOx emission levels using a modified coal burner nozzle installed on kiln # 2. Testing was to commence by early June 1996 and test data was to be submitted to DEP by early August 1996.

7. On October 16, 1996 DEP issued a letter to Respondent stating that DEP had not received NOx emissions testing data as stated in the May 28, 1996 letter. DEP requested that Tarmac provide immediate assessment of the NOx emission using the modified burner nozzle. Resolution of the NOx emission violation was to be achieved by January 1, 1997.

8. Resolution of the elevated NOx emissions was not achieved and pursuant to the FDEP/DERM air permitting delegation agreement, on April 14, 1997, DEP referred the continuing NOx emissions violation at the subject site to DERM for follow-up enforcement action.

9. On June 17, 1997 DERM issued a Notice of Violation (NOV) and

Orders for Corrective Action and Settlement for exceedances of permitted NOx emission rates. Said NOV ordered Respondent to submit a written plan detailing proposed corrective actions to ensure that the allowable limits for emissions are not exceeded.

10. The Respondent hereby consents to the terms of this Agreement without either admitting or denying the allegations made by DERM in the Notice of Violation and Orders for Corrective Action and Settlement; and

11. In an effort to insure continued protection of the health and safety of the public and the environment of Dade County and to insure compliance with Chapter 24, Metropolitan Dade County Environmental Protection Ordinance and to avoid time-consuming and costly litigation, the parties hereto stipulate and agree to the following, and it is ordered:

12. Upon execution of this Consent Agreement Respondent shall meet an interim NOx emission limit of 195 lbs/hr for kiln # 2. This NOx emission limit shall remain in effect until February 28, 1998 which is the expiration date of permit #AC 13-169901 or until kiln #2 is retrofitted for indirect firing or converted to an alternative fuel according to the timeframes set forth in paragraphs # 15 or # 16. Respondent shall then be required to meet Best Available Control Technology (BACT) NOx emission limitations for kiln #2 as stipulated in permit #AC 13-169901.

13. On or before December 31, 1997, Respondent shall declare in writing to DERM its method for meeting the BACT NOx emission limitations for kiln #2 as stipulated in permit #AC 13-169901.

14. Respondent shall submit complete applications for required air construction permits and/or permit modifications or renewals to the FDEP or Dade County DERM, as appropriate by January 31, 1998. Additional information requested by the appropriate agencies shall be provided by Respondent within fourteen (14) days of the date Respondent receives the request.

15. If Respondent relinquishes its authorization to burn coal in kiln # 2, the retrofitting of kiln # 2 to use an alternative fuel shall be completed within 90 days of receiving the construction permit to modify, referenced in paragraph #14, above and then Respondent shall adhere to NOx emissions limitations as set forth in the permit.

16. Alternatively to paragraph #15, if Kiln # 2 is converted to indirect firing, construction shall be completed within 12 months after receiving the construction permit to modify referenced in paragraph #14, above and then Respondent shall meet the same BACT NOx emission limitations as set forth in construction permit No. AC 13-169901.

17. Alternatively to paragraphs # 15 and # 16, if kiln # 2 is converted to dry process technology, construction shall be completed within 36 months after the required permits have been issued, and then Respondent shall meet the NOx emissions limitation of 113.8 lbs/hr.

18. Respondent shall pay to FDEP the Title V permitting fee for kiln #2 NOx emissions based on the interim rate of 195 lbs/hr. This fee shall be effective upon execution of this Consent Agreement and shall remain in effect until Respondent is in compliance with kiln #2 permitted NOx emissions limitations.

SAFETY PRECAUTIONS

19. The Respondent shall maintain the subject site, during the pendancy of this Agreement, in a manner which shall not pose a hazard or threat to the public at large or the environment and shall not cause a nuisance or sanitary nuisance as set forth in Chapter 24, Metropolitan Dade County Environmental Protection Ordinance.

VIOLATION OF REQUIREMENTS

20. This Agreement constitutes a lawful order of the Director of the Department of Environmental Resources Management and is enforceable in a civil or criminal court of competent jurisdiction pursuant to Chapter 24, Metropolitan Dade County Environmental Protection Ordinance. Violation of any requirement of the Agreement may result in enforcement action by DERM. Each violation of any of the terms and conditions of this Agreement by the Respondent shall constitute a separate offense.

SETTLEMENT COSTS

21. The Respondent hereby certifies that he has the financial ability to comply with the terms and conditions stipulated herein and to comply with the payments specified in this Agreement.

22. DERM has determined, that due to the costs incurred to bring the subject facility into compliance, a settlement of $196,189.00 is appropriate. The Respondent shall within thirty (30) days of the effective date of this Agreement, submit to DERM a check in the amount of $196,189.00, for full settlement payment. The Settlement shall be made payable to DERM and sent to the Department of Environmental Resources Management, c/o

Sharon Crabtree, Suite 1100, 33 SW 2nd Avenue, Miami, Florida, 33130.

23. In the event Respondent fails to submit, modify, implement, obtain, provide, operate, comply and or complete those items listed in paragraphs 12,13,14,15,16, and 17 herein, the Respondent shall pay DERM a civil penalty of one hundred dollars ($100.00) per day for each day of non-compliance and the Respondent shall be subject to enforcement action in a civil or criminal court of competent jurisdiction for such failure pursuant to the provisions set forth in Chapter 24, Metropolitan Dade County Environmental Protection Ordinance. Said payment shall be made by Respondent to DERM within ten (10) days of receipt of written notification and shall be sent to the Department of Environmental Resources Management, c/o Sharon Crabtree, at 33 S.W. 2nd Avenue, Miami, Florida 33130.

GENERAL PROVISIONS

24. Respondent shall allow authorized representatives of DERM access to the property at reasonable times for purposes of determining compliance with this Consent Agreement and the rules and regulations set forth in Chapter 24, Metropolitan Dade County Environmental Protection Ordinance

25. The DERM expressly reserves the right to initiate appropriate legal action to prevent or prohibit the future violations of applicable statutes or the rules promulgated thereunder.

26. Entry into this Consent Agreement does not relieve Respondent of the responsibility to comply with applicable federal, state or local laws, regulations and Ordinances.

27. Where timetables or conditions cannot be met by Respondent due to circumstances beyond the Respondent's control, Respondent shall provide written documentation to DERM, which shall substantiate that the cause(s) for the delay or non-compliance was not reasonably in the control of the Respondent. A determination of the reasonableness shall be made by DERM for the purpose of imposition of penalties pursuant to paragraph 22 herein.

28. This Agreement shall neither be evidence of a prior violation of this Chapter nor shall it be deemed to impose any limitation upon any investigation or action by DERM in the enforcement of Chapter 24, Metropolitan Dade County Environmental Protection Ordinance.

29. In consideration of the complete and timely performance by the Respondent of the obligations contained in the Agreement, DERM waives its rights to seek judicial imposition of damages or criminal or civil penalties for the matters alleged in this Agreement.

30. This Agreement shall become effective upon the date of execution by the Director, Environmental Resources Management or his designee.

_________________________   _________________________

Date   John D. Carr, President

Tarmac Florida, Inc.

BEFORE ME, the undersigned authority, personally appeared _______________________ who after being duly sworn, deposes and says that the has read and agrees to the foregoing.

Sworn to and subscribed before me this ____________ day of

____________________, 1997 by ________________________.

(name of affiant)

Personally Known ______ or Produced Identification ______.

(Check one)

Type of Identification Produced: ____________________.

____
Notary Public

____
Date

____
John W. Renfrow, P.E., Director
Environmental Resources Management

____
Witness

____
Witness

DERM
Complainant
VS.
Tarmac Florida, Inc.
Respondent

Tarmac File

Memorandum

Florida Department of Environmental Protection

TO: Donna Gordon, Chief, Code Enforcement
Dade County DERM

FROM: A. A. Linero, P.E. Administrator AAL 7/28

DATE: July 28, 1997

SUBJECT: Tarmac/Pennsuco Kiln No. 2

Per our teleconference of July 25, 1997 enclosed are the following references to nitrogen oxides emissions limits for Tarmac Kiln 2 from our permit files:

- EPA-issued Final Determination PSD-FL-050 dated July 8, 1980 for proposed conversions of Pennsucco Kilns 1, 2, and 3 to coal. Permit Condition 8 limits NOx from Kiln 2 to 118 lb/hr and 4.73 lb/ton clinker while burning coal. Per Table 4, this was the limit proposed by the applicant. Apparently the Kiln 2 conversion was deferred for some 10 years.

- Excerpt from application dated August 31, 1989 for Kiln 2 coal conversion project. Page 4 of the sealed application gives a maximum NOx emission rate of 169.25 lb/hr (6.77 lb/ton clinker). Value is also given on Page 2-6.

- Letter dated March 9, 1993 from KBN to DEP requesting exemption of Kilns 2 and 3 from Reasonable Available Control Technology (RACT) requirements for NOx. Table 2-1 attached to the letter acknowledges that the NOx limit is 113.8 lb/hr (4.55 lb/ton clinker). It includes the caveat that if emissions are between 113.8 to 169 lb/hr, Best Available Control Technology (BACT) may be re-evaluated by FDEP.

I was not the permitting engineer on any of these actions related to Tarmac and I was not involved with the Rinker consent order. At first glance, note that the Tarmac case appears to be at least a violation of a BACT limit in a PSD permit (PSD-FL-142). Construction projects offer the best chance for upgrading emissions controls and that opportunity arose for Tarmac during the coal conversion. Tarmac (or Pennsucco) has known (or should have known) for at least 17 years roughly what levels of NOx emissions represent BACT for NOx for Kiln 2. Tarmac did not approach DEP with a clear solution to its NOx problem even after they were advised in writing on October 16, 1996 that "the Department will have to take appropriate action to enforce the existing permit limits."

The Rinker case involves violation of a fairly recent RACT rule and Rinker apparently did not implement a major construction project affording a routine opportunity to upgrade its emissions control. That does not excuse a violation, but it is a difference. Presumably the modernization project at Rinker will afford that opportunity. In any case, Rinker approached the DEP with proposed solutions to its problem.

Our staff is available to assist, but by and large it appears that the facts to adequately support your action can be readily retrieved from your files. I can come by during one of my routine visits and review them with DERM. Please call me or John Reynolds if you have technical questions regarding Tarmac. If you wish to consult on Rinker or (possible) Tarmac consent orders, please contact Jim Pennington directly. We can be contacted at 850/488-1344.

AAL/aal

cc: Pat Wong, DERM
Sharon Crabtree, DERM
Clair Fancy, BAR
Jim Pennington, BAR
Tom Tittle, SED

JR
Kiln #2

METROPOLITAN DADE COUNTY, FLORIDA

METRO-DADE

RECEIVED

JUN 24 1997

BUREAU OF
AIR REGULATION

DERM

ENVIRONMENTAL RESOURCES MANAGEMENT
ENFORCEMENT SECTION
33 SOUTHWEST 2nd AVENUE
SUITE 1100
MIAMI, FLORIDA 33130-1540
(305) 372-6902

June 17, 1997

John D. Carr, President
Tarmac Florida, Inc.
1151 Azalea Garden Rd.
Norfolk, Va. 23502

CERTIFIED MAIL NO:P333150717
RETURN RECEIPT REQUESTED

Michael R. Kane, Vice President
Tarmac Florida, Inc.
11000 NW 121 Way
Medley, FL 33178

CERTIFIED MAIL NO:P333150723
RETURN RECEIPT REQUESTED

RE: Exceedances of permitted emissions at Tarmac/ Pennsuco portland Cement plant located at, near or in the vicinity of 11000 NW 121 Way, Medley, Florida, 33178.

Dear Messrs Carr and Kane:

NOTICE OF VIOLATION
AND
ORDERS FOR CORRECTIVE ACTION AND SETTLEMENT

A departmental review of reports for emission tests conducted on May 31, 1995 and December 17-20, 1996 revealed exceedances of allowable pollutants as follows:

Test Date	Emission Unit	Pollutant Test	Result	Allowable Emissions
5/31/95	kiln #2	Nitrogen Oxide	328.4 lbs/hr	113.8 lbs/hr
12/17/96	cooler #3	Particulate Matter	0.49 lbs/ton	0.1 lbs/ton
12/18/96	cooler #2	Particulate Matter	41.99 lbs/hr	23.71 lbs/hr
12/18/96	kiln #2	Particulate Matter	20.46 lbs/hr	14.40 lbs/hr
12/18/96	kiln #2	Nitrogen Oxide	307.2lbs/hr	113.8 lbs/hr
12/19/96	kiln #3	Sulfur Dioxide	6.98 lbs/ton	4.6 lbs/ton

Additionally, you have failed to submit the 1995 Annual Operating Report (AOR) for the referenced facility.

Be advised that the above constitute violations of the facility's Annual Operating Permits # AP-00604 and #AP-00368 issued by the Department of Environmental Resources Management (DERM) and specific conditions 5 and 8 of the Construction Permit AC 13-169901 and specific conditions 2 and 7 of the Operating Permit AO 13-238048 issued by the Florida Department of Environmental Protection (DEP).

Furthermore, said operations constitute violations of Section 62-296.320, 62-296.407 and 62-297.415 of the Florida Administrative Code and Sections 24-35.1, 24-54 and 24-55 of the Metropolitan Dade County Environmental Protection Ordinance.

Based on the above, and pursuant to the authority granted to me under Chapter 24, I am ordering you to submit to this Department the following items within thirty (30) days of receipt of this Notice:

(1) A complete written plan detailing proposed corrective actions to ensure that the allowable limits for emissions are not exceeded.

Be further advised that the above-referenced violations are subject to mandatory civil penalties which have been calculated at the amount of one hundred ninety two thousand dollars ($192,000). This case penalty calculation represents a settlement offer which shall remain open for thirty (30) days from your receipt of this letter.

Failure to resolve this matter within the thirty (30) day time period may result in this case being referred to the Office of the County Attorney for further enforcement action in a court of competent jurisdiction.

If you have any questions regarding the above please contact this office at (305) 372-6902 or the Air Facilities Section at (305) 372-6925.

Sincerely,

Sharon Crabtree

Sharon Crabtree
Code Enforcement Officer

CC: A.A. Linero, DEP
CC: Tom Tittle, DEP
CC: Albert Townsend, Tarmac PBC
SC:kjb

Memorandum

Florida Department of Environmental Protection

TO: Donna Gordon, Chief, Code Enforcement
Dade County DERM

FROM: A. A. Linero, P.E. Administrator *A A Linero 4/15*

DATE: April 15, 1997

SUBJECT: Tarmac/Pennsuco Kiln No. 2

Per your verbal request of April 14, 1997, attached are the following items from the permitting files in Tallahassee:

- Copy of Operating permit AO 13-238048 issued December 17, 1993
- Letter dated May 8, 1995 relating to the Department's extension of the construction permit PSD-FL-142 Kiln No. 2
- Letter dated July 21, 1995 from Tarmac to Mr. Clair Fancy containing data for six stack emissions tests
- Letter from Tarmac dated August 30, 1995 regarding the submittal of the processing fee of $250 for an extension
- Letter from Hopping, Green, Sams & Smith dated October 3, 1995, discussing future tactics for resolving NO_x issue
- Department letter dated November 20, 1995 to Tarmac granting the requested extension
- Letter from KBN dated February 16, 1996 consisting of a literature search completed on the behalf of Tarmac relating to NO_x issues
- Letter from KBN dated May 30, 1996 to the Department relating the status of Tarmac efforts to reduce NO_x, including a summary of SO_2 and NO_x emissions
- Copy of pertinent section 62-213.420(1)(a)4

Please call me if you have any further questions or requests at (904) 488-1344.

AL/hh

cc: Pat Wong, DERM (w/o attachments)
Tom Tittle, SED (w/o attachments)
Pat Comer, OGC (w/o attachments)
Luna Ergas, OGC (w/o attachments)
Jim Pennington, BAR (w/o attachments)

Memorandum

Florida Department of Environmental Protection

TO: Donna Gordon, Chief, Code Enforcement
Dade County DERM

THRU: Clair Fancy, Chief
DARM/Bureau of Air Regulation

FROM A. A. Linero, P.E. Administrator
DARM/New Source Review

DATE: March 25, 1997

SUBJECT: Tarmac/Pennsuco Kiln 2 Air Construction Permit Emission Limits

Kiln 2 is one of the original cement kilns at Tarmac/Pennsuco. It produces 25 tons per hour (TPH) of clinker. Kiln 2 was permitted to convert to coal-firing from natural gas in 1991. The permit No. is AC13-169901 and is a Florida Department of Environmental Protection (FDEP) air construction permit issued pursuant to Chapter 403, Florida Statutes and the associated Department rules. Certain conditions pursuant to the Department's Prevention of Significant Deterioration (PSD) rules are incorporated therein. Since its conversion, the kiln has not achieved the permitted limits for nitrogen oxides (NOx) given in the permit. Attached for your review and action are the following items fro the permitting files:

- Air construction permit dated February 25, 1991 including Best Available Control Technology (BACT) Determination. Kiln No. 2 has not demonstrated compliance with Specific Condition 5 on page 6. It limits NOx emissions to 4.55 pounds per ton clinker (lb/ton) and 113.8 pounds per hour (lb/hr). Specific Condition 12, page 6 provides for a **one year** test program during which enforcement was not to be initiated. Based on the results of the program, **upward** adjustment of the NOx limits to 6.77 lb/ton and 169.3 lb/hr may result.

- Petition for Formal Administrative Proceedings filed for Tarmac by Hopping Boyd Green & Sams on June 19, 1990. The relief requested was that limits be initially set at 169.3 lb/hr (6.77 lb/ton) with the possibility of adjustment downward. This petition was dismissed after a joint stipulation resulted in the above mentioned permit in consideration of Tarmac's request.

- Department letter of October 16, 1996 requesting an update form Tarmac and advising of possible enforcement.

- Letter dated January 21, 1997 from Golder Associates. According to attached Table A, Tarmac has conducted a **two and one-half** year program and has been unable to meet <u>even its own requested NOx limit.</u> The ranges have been 177 to 450 lb/hr and 8.08 to 21.54 lb/ton.

Although Tarmac continues to conduct tests and plans to provide the results to the Department, we consider the period during which the Department shall not initiate enforcement to have ended.

Copies of past permitting documents should be in the files of the DERM Air Division (who have received a Title V Operation permit application from Tarmac). Please advise Tom Tittle of the Southeast District of your intended action within two weeks. If you have any questions, please call me or John Reynolds at (904)488-1344.

AAL/aal/l

cc: Pat Wong, DERM
Tom Tittle, SED
Pat Comer, OGC
Luna Ergas, OGC
Jim Pennington, BAR

Polaris - Barr Mfr.

Florida Department of Environmental Regulation

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

Lawton Chiles, Governor

Carol M. Browner, Secretary

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION
NOTICE OF PERMIT

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

February 26, 1991

Enclosed is construction permit No. AC 13-169901, PSD-FL-142, to convert kiln No. 2 to coal firing at Tarmac, Inc. in Medley, Dade County, Florida. This permit is issued pursuant to Section 403, Florida Statutes.

Any party to this permit has the right to seek judicial review of the permit pursuant to Section 120.68, Florida Statutes, by the filing of a Notice of Appeal pursuant to Rule 9.110, Florida Rules of Appellate Procedure, with the Clerk of the Department in the Office of General Counsel, 2600 Blair Stone Road, Tallahassee, Florida 32399-2400; and by filing a copy of the Notice of Appeal accompanied by the applicable filing fees with the appropriate District Court of Appeal. The Notice of Appeal must be filed within 30 days from the date this permit is filed with the Clerk of the Department.

Executed in Tallahassee, Florida.

STATE OF FLORIDA DEPARTMENT
OF ENVIRONMENTAL REGULATION

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

Copy 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 PERMIT and all copies were mailed before the close of buisness on 2-27-91.

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 Dober 2-27-91

Clerk Date

FINAL DETERMINATION

The Technical Evaluation and Preliminary Determination for the permit to convert kiln No. 2 to coal firing at Tarmac, Inc. in Medley, Dade County, Florida, was distributed on March 29, 1990. The Notice of Intent to Issue was published in The Miami Herald on August 7, 1990. Copies of the evaluation were available for public inspection at the Department's Tallahassee and West Palm Beach offices.

Comments from the U.S. Environmental Protection Agency (EPA), the National Park Service (NPS), and the Dade County Department of Environmental Resources Management (DCDERM) were submitted on the Department's Intent to Issue the permit.

The EPA commented that the permit must include an emission limit and test method for CO and PM_{10}, and specific measures for controlling fugitive emissions from the storage of coal. These changes are included in the final permit.

The NPS took exception to the applicant's proposal of setting final emission limits after performance testing has been completed, arguing that this approach is inconsistent with today's "top down" BACT policy. Considering that the EPA did not take exception to this, the Department decided to agree to consider upward adjustments of the emission limits if warranted based on extensive testing to be carried out by the applicant over a period of one year. The NPS also pointed out that the applicant's air quality analysis may not have included increment consuming sources located outside of Dade County which may impact the Everglades National Park. The Department again reviewed the application and verified that the emissions inventory used in the modeling analysis did include sources located in Broward as well as Dade County. The NPS also expressed concern about the potential of the applicant's proposed source to contribute to the regional haze problem, citing published reports that such large sources can cause marked reductions in visibility, primarily as a result of sulfates and organics. The Department believes that the emission limits in the final permit will not result in future reduced visibility for the Everglades National Park, and especially since the allowable Class I SO_2 increment is virtually consumed by this source thus precluding further impact.

The DCDERM stated that the applicant has not adequately demonstrated that Kilns 2 and 3 are substantially different justifying higher emission limits for Kiln 2. They feel that data for Kiln 3 can be used as a basis for the BACT determination for Kiln 2. The Department believes that the final permit conditions satisfy the concerns expressed by the DCDERM.

On June 19, 1990, a petition was filed by Tarmac for an administrative hearing to review the BACT Determination and proposed emission limits. The issues contested in the petition were later resolved between the parties without the hearing. A final order containing modified permit conditions was filed on December 7, 1990. The final action of the Department will be to issue construction permit AC 13-169901, PSD-FL-142 as modified by the final order and incorporating the changes required by EPA.

Florida Department of Environmental Regulation

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

Lawton Chiles, Governor

Carol M. Browner, Secretary

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

Permit Number: AC 13-169901
PSD-FL-142
Expiration Date: June 30, 1992
County: Dade
Latitude/Longitude: 25°52'30"N
80°22'30"W
Project: Kiln No. 2 Coal Conversion

This permit is issued under the provisions of Chapter 403, Florida Statutes, and Florida Administrative Code Chapters 17-2 and 17-4. The above named permittee is hereby authorized to perform the work or operate the facility shown on the application and approved drawing(s), plans, and other documents attached hereto or on file with the Department and made a part hereof and specifically described as follows:

For the conversion of kiln No. 2 to coal firing. The project will be located at the permittee's existing facility in Medley, Dade County, Florida. The UTM coordinates are Zone 17, 562.8 km East and 2861.7 km North.

The source shall be constructed in accordance with the permit application, plans, documents, amendments and drawings, except as otherwise noted in the General and Specific Conditions.

Attachments are listed below:

1. Application to construct received September 5, 1989.
2. DER's letter of incompleteness dated October 4, 1989.
3. EPA's letter dated October 18, 1989.
4. KBN's response (to incompleteness letter) dated November 13, 1989.
5. Dade County DERM's letter dated November 17, 1989.
6. EPA's letter dated December 13, 1989.
7. KBN's letter dated December 21, 1989.
8. KBN's letter dated January 15, 1990.
9. KBN's letter dated January 30, 1990.
10. EPA's letter dated March 20, 1990.
11. EPA's letter dated April 13, 1990.
12. Dade County DERM's letter dated April 30, 1990.
13. NPS's letter dated May 30, 1990.

PERMITTEE:
Tarmac Florida, Inc.

Permit Number: AC 13-169901
PSD-FL-142
Expiration Date: June 30, 1992

GENERAL CONDITIONS:

1. The terms, conditions, requirements, limitations, and restrictions set forth in this permit are "Permit Conditions" and are binding and enforceable pursuant to Sections 403.161, 403.727, or 403.859 through 403.861, Florida Statutes. The permittee is placed on notice that the Department will review this permit periodically and may initiate enforcement action for any violation of these conditions.

2. This permit is valid only for the specific processes and operations applied for and indicated in the approved drawings or exhibits. Any unauthorized deviation from the approved drawings, exhibits, specifications, or conditions of this permit may constitute grounds for revocation and enforcement action by the Department.

3. As provided in Subsections 403.087(6) and 403.722(5), Florida Statutes, the issuance of this permit does not convey any vested rights or any exclusive privileges. Neither does it authorize any injury to public or private property or any invasion of personal rights, nor any infringement of federal, state or local laws or regulations. This permit is not a waiver of or approval of any other Department permit that may be required for other aspects of the total project which are not addressed in the permit.

4. This permit conveys no title to land or water, does not constitute State recognition or acknowledgement of title, and does not constitute authority for the use of submerged lands unless herein provided and the necessary title or leasehold interests have been obtained from the State. Only the Trustees of the Internal Improvement Trust Fund may express State opinion as to title.

5. This permit does not relieve the permittee from liability for harm or injury to human health or welfare, animal, or plant life, or property caused by the construction or operation of this permitted source, or from penalties therefore; nor does it allow the permittee to cause pollution in contravention of Florida Statutes and Department rules, unless specifically authorized by an order from the Department.

GENERAL CONDITIONS:

6. The permittee shall properly operate and maintain the facility and systems of treatment and control (and related appurtenances) that are installed or used by the permittee to achieve compliance with the conditions of this permit, as required by Department rules. This provision includes the operation of backup or auxiliary facilities or similar systems when necessary to achieve compliance with the conditions of the permit and when required by Department rules.

7. The permittee, by accepting this permit, specifically agrees to allow authorized Department personnel, upon presentation of credentials or other documents as may be required by law and at a reasonable time, access to the premises, where the permitted activity is located or conducted to:

a. Have access to and copy any records that must be kept under the conditions of the permit;

b. Inspect the facility, equipment, practices, or operations regulated or required under this permit; and

c. Sample or monitor any substances or parameters at any location reasonably necessary to assure compliance with this permit or Department rules.

Reasonable time may depend on the nature of the concern being investigated.

8. If, for any reason, the permittee does not comply with or will be unable to comply with any condition or limitation specified in this permit, the permittee shall immediately provide the Department with the following information:

a. a description of and cause of non-compliance; and

b. the period of noncompliance, including dates and times; or, if not corrected, the anticipated time the non-compliance is expected to continue, and steps being taken to reduce, eliminate, and prevent recurrence of the non-compliance.

GENERAL CONDITIONS:

The permittee shall be responsible for any and all damages which may result and may be subject to enforcement action by the Department for penalties or for revocation of this permit.

9. In accepting this permit, the permittee understands and agrees that all records, notes, monitoring data and other information relating to the construction or operation of this permitted source which are submitted to the Department may be used by the Department as evidence in any enforcement case involving the permitted source arising under the Florida Statutes or Department rules, except where such use is prescribed by Sections 403.73 and 403.111, Florida Statutes. Such evidence shall only be used to the extent it is consistent with the Florida Rules of Civil Procedure and appropriate evidentiary rules.

10. The permittee agrees to comply with changes in Department rules and Florida Statutes after a reasonable time for compliance, provided, however, the permittee does not waive any other rights granted by Florida Statutes or Department rules.

11. This permit is transferable only upon Department approval in accordance with Florida Administrative Code Rules 17-4.120 and 17-30.300, F.A.C., as applicable. The permittee shall be liable for any non-compliance of the permitted activity until the transfer is approved by the Department.

12. This permit or a copy thereof shall be kept at the work site of the permitted activity.

13. This permit also constitutes a Determination of Best Available Control Technology (BACT) and Determination of Prevention of Significant Deterioration (PSD).

14. The permittee shall comply with the following:

a. Upon request, the permittee shall furnish all records and plans required under Department rules. During enforcement actions, the retention period for all records will be extended automatically unless otherwise stipulated by the Department.

GENERAL CONDITIONS:

b. The permittee shall hold at the facility or other location designated by this permit records of all monitoring information (including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation) required by the permit, copies of all reports required by this permit, and records of all data used to complete the application for this permit. These materials shall be retained at least three years from the date of the sample, measurement, report, or application unless otherwise specified by Department rule.

c. Records of monitoring information shall include:

- the date, exact place, and time of sampling or measurements;
- the person responsible for performing the sampling or measurements;
- the dates analyses were performed;
- the person responsible for performing the analyses;
- the analytical techniques or methods used; and
- the results of such analyses.

15. When requested by the Department, the permittee shall within a reasonable time furnish any information required by law which is needed to determine compliance with the permit. If the permittee becomes aware that relevant facts were not submitted or were incorrect in the permit application or in any report to the Department, such facts or information shall be corrected promptly.

SPECIFIC CONDITIONS:

1. The construction and operation of the subject modification of kiln No. 2 shall be in accordance with the capacities and specifications stated in the application.

2. The maximum clinker production rate of kiln No. 2 shall not exceed 25 tons per hour and 197,100 tons per year. Kiln No. 2 shall operate only on coal firing for up to 7,884 hours per year at a maximum firing rate of 162.5 MMBtu per hour. The coal used for firing kiln No. 2 shall have a maximum sulfur content of 2.0 percent by weight, with the rolling 30-day average sulfur content not exceeding 1.75 percent by weight.

3. Sulfur dioxide emissions from kiln No. 2 shall not exceed 7.8 lbs/ton of clinker produced, 195.0 lbs/hr, 768.7 tons/yr.

PERMITTEE:
Tarmac Florida, Inc.

Permit Number: AC 13-169901
PSD-FL-142
Expiration Date: June 30, 1992

SPECIFIC CONDITIONS:

4. Sulfuric acid mist emissions from kiln No. 2 shall not exceed 0.23 lb/ton of clinker produced, 5.86 lbs/hr, 23.06 tons/yr.

5. Nitrogen oxides emissions from kiln No. 2 shall not exceed 4.55 lbs/ton of clinker produced, 113.8 lbs/hr, 448.4 tons/yr.
0.7 lb/mmBtu

6. Carbon monoxide emissions from kiln No. 2 shall not exceed 346 lbs/hr, 1363.9 tons/yr.

7. VOC emissions from kiln No. 2 shall not exceed 28.8 lbs/hr, 113.5 tons/yr.

8. Particulate matter emissions from kiln No. 2 shall not exceed 14.40 lbs/hr, 56.76 tons/yr.

9. PM_{10} emissions from kiln No. 2 shall not exceed 12.24 lbs/hr, 48.25 tons/yr. Compliance for PM_{10} shall be determined by applying a factor of 0.85 to the measured particulate matter emissions.

10. All reasonable precautions that apply under F.A.C. Rule 17-2.610(3) shall be implemented to limit unconfined emissions of particulate matter from any activity associated with this project. Adequate watering of the coal pile area shall be conducted whenever visible emissions occur in that area. The frequency of watering shall be no more than every half hour.

11. Initial and annual compliance tests shall be conducted using the following test methods:

EPA Method 5 for particulate matter
EPA Method 7 for nitrogen oxides
EPA Method 8 for sulfur dioxide and acid mist
EPA Method 25 for VOC
EPA Method 10 for carbon monoxide

12. Tarmac shall conduct a series of compliance tests for SO_2, H_2SO_4 mist, and NO_x emissions every two months for up to one year to allow representative sampling during different times of the year. The tests shall be performed in accordance with the compliance test methods specified in this permit. In the event that this series of tests results in SO_2 emissions in the range of 195 to 275 lbs/hr (up to 11 lbs/ton clinker, 1,084.1 TPY), NO_x emissions in the range of 113.8 to 169.3 lbs/hr (up to 6.77 lbs/ton clinker, 667.2 TPY), or H_2SO_4 mist emissions in the range

SPECIFIC CONDITIONS:

of 5.86 to 8.25 lbs/hr (up to 0.33 lbs/ton clinker, 32.52 TPY), the Department, if requested by the permittee, shall re-evaluate BACT and consider upward adjustments of the emission limitations for the indicated constituents based on available data. During this testing and evaluation period, the permittee shall make reasonable efforts to limit air emissions, and the Department shall not initiate enforcement proceedings. Any upward adjustment of emission limitations pursuant to this paragraph shall be the subject of public notice in a local newspaper pursuant to Department rules. The Department's determination based on the data produced under this paragraph shall be a point of entry for purposes of Section 120.57, Florida Statutes.

13. The compliance tests shall be conducted within 30 days after operation on coal begins. The Department's Southeast District office and the Dade County Department of Environmental Resources Management (DCDERM) shall be notified in writing at least 15 days prior to source testing and at least 5 days prior to initial startup. Written reports of the tests shall be submitted to those offices within 45 days of test completion.

14. The permittee, for good cause, may request that this construction permit be extended. Such a request shall be submitted to the Bureau of Air Regulation prior to 60 days before the expiration of the permit (F.A.C. Rule 17-4.090).

15. An application for an operation permit must be submitted to the Department's Southeast District office and the DCDERM at least 90 days prior to the expiration date of this construction permit or within 45 days after completion of compliance testing, whichever occurs first. To properly apply for an operation permit, the applicant shall submit the appropriate application form, fee, certification that construction was completed noting any deviations from the conditions in the construction permit, and compliance test reports as required by this permit (F.A.C. Rule 17-4.220).

Issued this 25 day
of February, 1991

STATE OF FLORIDA DEPARTMENT
OF ENVIRONMENTAL REGULATION

Carol M. Browner

Carol M. Browner, Secretary

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 6.77 7

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 previous 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

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FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION

Department of Environmental Protection

DIVISION OF AIR RESOURCES MANAGEMENT

Payment No. - 160814
Remittance No. - 156052

MAJOR AIR POLLUTION SOURCE ANNUAL EMISSIONS FEE FORM

Please read the instructions for this form and print or type all information.

CALENDAR YEAR EMISSIONS REPORTED: 1996

OK
STW
3/6/97

Fee payment is due between January 15th and March 1st of following year. If the Department has not received the fee payment by March 1st, the Department shall impose, in addition to the fee, a penalty of 50 percent of the amount of the unpaid fee, plus interest on such amount computed in accordance with s. 220.807, Florida Statutes, except as provided at Rule 62-213.205, F.A.C. The Department may revoke any major air pollution source operation permit if it finds that the permit holder has failed to pay timely any required annual emissions fee, penalty or interest.

FACILITY INFORMATION

1. Facility owner/company name TARMAC AMERICA, INC.	2. Facility ID Number 0250020
3. Facility name/street address or location description Pennsuco Cement Plant 11000 NW 121 Way	
4. Facility city: Medley / Zip code: 33178	County: Dade
5. Name of person to be contacted if there are questions about information submitted Scott Quaas — Environmental Manager	6. Contact's telephone number (954) 425-4165
7. Total Fee Amount from Page C [Obj.: 002275]	$ 146,545.00
8. One-time fee credit (if applicable from Page D)	$
9a. Penalty (if applicable) $ / 9b. Interest (if applicable) $	9c. Penalty + Interest (9a.+ 9b.) [Obj.: 002276] $
10. Total payment remitted	$ 146,545.00

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RESPONSIBLE OFFICIAL CERTIFICATION

I, the undersigned, am the responsible official as defined in Chapter 62-213, F.A.C., of the Title V source for which this document is being submitted. I hereby certify, based on the information and belief formed after reasonable inquiry, that the statements made and data contained in this document are true, accurate, and complete.

Signature

Name	Title	Date
Hardy Johnson	Vice President—Cement/Ready-Mix	2/19/97

Submit check, draft, or money order, made payable to **Florida DEP**. Send payment & completed form to:

Title V Annual Emissions Fee, Cashiers Office, Bureau of Finance And Accounting, P.O. Box 3070, Tallahassee, Florida 32315-3070

MAJOR AIR POLLUTION SOURCE ANNUAL OPERATION LICENSE FEE FORM
SOURCE INFORMATION SHEET

Facility Name: **TARMAC - Pennsuco Cement Plant**

Emissions Unit Permit/Certification No.: **AO13-238048**

Emissions Unit I.D. No. (if known): ____________

Brief Description of Source (emission unit regulated individually, or group or emission units regulated collectively): Kiln #2 (Includes revisions in AC13-169901)

I. Regulated Air pollutant(s) allowed to be emitted by specific permit condition for this emission unit or group of emissions units (excluding carbon monoxide)	II. Most limiting maximum allowable pollutant emission rate (fill in one column only for each pollutant)				III. Operating conditions - Maximum allowed by permit per year		IV. Operating conditions - Actual documented for reported calendar year		V. Annual emissions to which fees apply		
	pounds per hour	tons per year	tons per unit of material or heat input or product output		hours of operation	amount of material or heat input or product output [in units specified in column (e)]	hours of operation	amount of material or heat input or product output [in units specified in column (e)]	calculated annual tons of pollutant emissions	actual tons recorded annual emissions using C.E.M. or other DEP approved method	code
(a)	(b)	(c)	(tons) (d)	(units) (e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)
particulates	14.4				7884		7713		55.5		
PM10	12.2				7884		7713		47.0		
SO_2	195.0				7884		7713		752.0		
H_2SO_4	5.9				7884		7713		22.8		
NO_x	113.8				7884		7713		438.9		
VOC	28.8				7884		7713		111.1		

Calculations/Comments:

No. 2 of 17 total Source Information Sheets submitted for this facility.

Effective: 1-1-96
FEB97

DER Form 62-213.900(1) - **Page B**

MAJOR AIR POLLUTION SOURCE ANNUAL OPERATION LICENSE FEE FORM
SOURCE INFORMATION SHEET

Facility Name: **TARMAC - Pennsuco Cement Plant**

Emissions Unit Permit/Certification No.: **AO13-238048**

Emissions Unit I.D. No. (if known): ____________

Brief Description of Source (emission unit regulated individually, or group or emission units regulated collectively): Kiln #3

I. Regulated Air pollutant(s) allowed to be emitted by specific permit condition for this emission unit or group of emissions units (excluding carbon monoxide)	II. Most limiting maximum allowable pollutant emission rate (fill in one column only for each pollutant)				III. Operating conditions - Maximum allowed by permit per year		IV. Operating conditions - Actual documented for reported calendar year		V. Annual emissions to which fees apply		
	pounds per hour	tons per year	tons per unit of material or heat input or product output		hours of operation	amount of material or heat input or product output [in units specified in column (e)]	hours of operation	amount of material or heat input or product output [in units specified in column (e)]	calculated annual tons of pollutant emissions	actual tons recorded annual emissions using C.E.M. or other DEP approved method	code
			(tons)	(units)							
(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)
particulates			1.5e-04	DKF				1057553	158.6		
SO_2			2.3e-03	CLK				668492	1537.5		
NO_x			3.4e-03	CLK				668492	2272.9		

Calculations/Comments:

No. 4 of 17 total Source Information Sheets submitted for this facility.

MAJOR AIR POLLUTION SOURCE ANNUAL OPERATION LICENSE FEE FORM
FEE PAYMENT CALCULATION SHEET

Facility Name: TARMAC - Pennsuco Cement Plant

Regulated Air pollutant(s) allowed to be emitted by specific permit conditions for this facility (excluding carbon monoxide).	Total facility annual emissions for each pollutant listed in column (a). [Sum of column entries (j) and/or (k) for pollutant on Page(s) B for all emission units at facility]	If amount in column (b) is less than 4000 tons, enter amount in column (c). If the amount in column (b) is equal to or greater than 4000 tons, enter 4000 in column (c).	Multiply amount in column (c) by the applicable fee factor pursuant to Rule 62-213.205, F.A.C. and enter dollar amount in column (d).
(a)	(b)	(c)	(d)
particulate matter	679.6	679.6	$16,990.00
PM10	47.0	47.0	$1,175.00
sulfur dioxide [SO_2]	2289.5	2289.5	$57,237.50
nitrogen oxides [NO_x]	2711.8	2711.8	$67,795.00
sulfuric acid mist	22.8	22.8	$570.00
VOC emissions	111.1	111.1	$2,777.50
Total Fee Amount (must be no less than $250.00 minimum fee)			**$146,545.00**

Golder Associates Inc.

6241 NW 23rd Street, Suite 500
Gainesville, FL 32653-1500
Telephone (352) 336-5600
Fax (352) 336-6603

Golder Associates

January 21, 1997

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BUREAU OF
AIR REGULATION

Mr. A. A. Linero, Administrator
New Source Review Section
Florida Department of Environmental Protection
2600 Blair Stone Road
Tallahassee, Fl 32399-2400

Re: Investigation of NO_x Emissions
Tarmac Florida, Kiln No. 2

Dear Mr. Linero:

The purpose of this letter is to respond to the Florida Department of Environmental Protection (the "Department") letter dated October 16, 1996, and to present a status report on the investigation of NO_x emissions from Kiln No. 2. As you are aware, Tarmac Florida, Inc., has been investigating the high NO_x emissions being experienced from Kiln 2, and potential methods to reduce the emissions. The thrust of our efforts has been toward discovering the reasons for the high emissions, and what can be done to reduce the emissions.

This letter presents a status report to the Department, which presents the results of our efforts to date. Some of the information presented in our May 28, 1996, status report is repeated herein, in order to be complete. In addition, Tarmac's continuing efforts to determine if NO_x reduction measures implemented by Tarmac can result in achieving the permitted NO_x limit, or to what extent they can reduce emissions, are described.

<u>Kiln No. 3 Emissions and Basis for Original BACT</u>

The Department has requested that Tarmac investigate why the NO_x emissions from Kiln No. 2 exceed the BACT limit stated in the permit, and why such emissions are much higher than Kiln No. 3, which was the basis for the BACT. Therefore, a review of the permitting history of the Kiln No. 2 coal conversion PSD permit is presented.

In the original PSD permit application for the Kiln No. 2 coal conversion, Tarmac proposed BACT levels of 400 lb/hr for SO_2 (16 lb/ton clinker) and 169.3 lb/hr for NQ (6.77 lb/ton clinker) as <u>starting points</u> for the BACT evaluation. This starting point for NO_x was based on the permitted emission limit for Kiln No. 3, which experience had shown was achievable in Kiln No. 3, as well as a limited set of test data from Kiln No. 2 in 1980 when burning fuel oil and gas (see attached data).

It is important to recognize that the proposed BACT control technology was determined by the Department to be good combustion practices and the inherent SO_2 removal within the kiln system. Due to concerns over the nearby PSD Class I area (Everglades National Park), SO_2

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emissions were considered to be of much more importance at the time. Subsequently, EPA agreed that BACT for NO_x was good operating and maintenance procedures to minimize NO_x emissions.

Tarmac proposed and strongly argued that a comprehensive test program be conducted prior to setting any final emission limits for Kiln No. 2. This was due to the uncertainty in emissions from Kiln No. 2 versus Kiln No. 3 (due to different size of the kilns and different firing types). Tarmac alluded to a similar experience with Kiln No. 3 when it was converted to coal. An emission limit was agreed to without any test data, and the limit proved to be unattainable. Therefore, the Kiln No. 3 emission limits were revised. Tarmac did not want to make this same error again. Tarmac's commitment was to minimize SO_2 emissions to the extent possible, again due to the Class I area concerns. EPA approved the testing plan as a mechanism to set the BACT limit for SO_2 in January 1990. The BACT limit for NO_x was also to be set through the testing program.

The actual test data from Kiln No. 2 shows that the original commitment of minimizing SO_2 emissions to the extent practical is limited if NO_x emissions are to be reduced. The data reflect Tarmac's previous experience that reducing NO_x emissions results in an increase in SO_2 emissions. Prior to the most recent change to the coal burner on Kiln No. 2, actual SO_2 emissions were well below the allowable BACT limit. However, after installation of the new coal burner, which significantly reduced NO_x emissions, the SO_2 emissions increased markedly. As will be discussed in this report, the low NO_x emissions in effect cause the conversely high SO_2 emissions.

<u>Kiln No. 2 NOx Emissions</u>
A complete summary of the SO_2 and NO_x emissions data and related process data obtained to date for Kiln No. 2 is presented in Table A attached. A discussion of these tests is provided below.

Burner Modifications
The series of tests spanning April 1994 through December 1995 were required by the original construction permit. These tests were conducted with the original coal burner installed under the construction permit. The nozzle diameter of the coal burner was 13 inches during these tests. Since these series of tests resulted in relatively high NO_x emissions, Tarmac decided to modify the coal burner. The rationale for this change is described below.

Kiln No. 2 is a direct fired kiln. This means that the primary combustion air to the kiln is provided through the coal burner. Air is swept through the coal mill, which provides for drying of the coal, as well as pneumatic conveying of the coal. The air and coal is then discharged into the kiln through the burner. Additional secondary combustion air to the kiln is provided via air from the clinker cooler. Clinker cooler air is drawn into the kiln by means of the draft created by the kiln.

In the direct fired system, the control over the primary combustion air is limited since a certain minimum air flow through the coal mill must be maintained in order to dry and convey the coal. Flame characteristics (i.e., flame length and intensity) are critical to producing clinker of acceptable quality. However, one potential means of reducing the primary air requirements, and potentially reducing NO_x emissions, is to reduce the coal burner nozzle diameter. By reducing the nozzle diameter, it may be possible to maintain the critical flame characteristics and at the same time reduce the amount of primary air.

In order to investigate this potential, prior to the May 1996 testing the coal burner was modified to a 10 inch nozzle diameter. Although this modification resulted in NO_x emissions which were at the low end of the range of emissions experienced in the past for Kiln No. 2, emissions were still well above the permitted limit. In addition, this nozzle diameter was considered to be too small by plant personnel because it limited too severely the air flow through the coal mill, and high velocities at the nozzle tip were causing excessive wear on the burner tip.

As a result, the burner nozzle diameter was increased to 11 inches prior to the July 31, 1996 testing. Initial test results indicate that this nozzle configuration has significantly reduced NO_x emissions, that the burner is not adversely affected, and that satisfactory clinker can be produced using this burner. However, additional testing is needed to confirm these initial results. The December 1996 tests results were inconclusive due to kiln operating problems during the testing period.

Results of Testing
As shown in Table A, during the tests when the coal burner diameter was 13 inches (1994 and 1995 testing), the SO_2 emissions were generally very low, while the NQ emissions were high compared to the permitted emission rates. According to plant kiln operators, the SO_2 and NO_x emissions are related to the oxygen level in the kiln. They state that as the oxygen level in the kiln increases, SO_2 emissions decrease while NO_x emissions increase. They stated that this trend has also been evident on Kiln No. 3.

The available test data for Kiln No. 2 was analyzed to determine if a correlation exists between NO_x, oxygen and SO_2 emissions. During the stack tests on Kiln No. 2, oxygen level at the stack is measured. However, this measurement is affected by infiltration of ambient air into the system and is not reflective of conditions in the kiln. Therefore, oxygen levels in the kiln itself are needed. Tarmac maintains a kiln oxygen monitor on Kiln No. 2, and data from this monitor is archived. Due to this archiving, kiln oxygen data for only the 1996 tests were available. As a result, the stack oxygen data were analyzed to determine if any correlation exists between NO_x emissions and stack oxygen level. Kiln oxygen levels were also evaluated for the 1996 data.

Based on this evaluation, no significant relationship between stack or kiln oxygen level and NO_x or SO_2 emissions was found. However, there is a general trend towards lower NO_x emissions as oxygen level in the kiln is decreased.

The coal burner nozzle diameter was 10 inches during the May 1996 testing. As described previously, this burner diameter caused operating problems with the burner and the coal mill. Also, NO_x emissions averaged 253 lb/hr and 2.1 lb/MMBtu, which are lower than many pervious tests, but remained above the permit "window" of 169.3 lb/hr , and above the RACT limit of 2.0 lb/MMBtu.

As a result, Tarmac modified the burner to an 11 inch nozzle diameter for the July/August 1996 testing. While resulting in satisfactory kiln and coal mill operation, the NO_x emissions from the July/August testing averaged 199.4 lb/hr and 1.56 lb/MMBtu. Although this emission level exceeds the permit "window" of 169.3 lb/hr, it is within the RACT limit of 2.0 lb/MMBtu.

Additional testing was conducted in December 1996 in an effort to duplicate the success of the July/August tests. Results from this test were much higher than the July/August testing, averaging 307 lb/hr and 2.90 lb/MMBtu. However, these higher emission rates are not considered to be representative of normal operation, because the kiln was experiencing some operational problems during the testing. During the testing, the kiln was experiencing several "hot spots" on the kiln shell.

Hot spots are areas of the kiln shell where the inner coating of brick and clinker has worn thin, causing the outer shell temperature to rise. When such conditions occur, the operator reduces fuel consumption and therefore clinker production, so as to not cause damage to the kiln. During this testing, the hot spots were in the area of the coal flame. As a result, the operator also increased the combustion air to the kiln, as a means of decreasing kiln temperatures. These operating changes are believed to be the cause of the higher NO_x emissions.

Because of the hot spots developing in the kiln, Tarmac is shutting down the kiln in January for repairs. The kiln will be brought back on-line in late February. Tarmac is planning an additional test for NO_x and SO_2 emissions in February or early March to confirm the emissions with the new burner pipe when the kiln is operating normally.

Conclusions
Based on the information gathered to date for Kiln No. 2, the reasons for the high NO_x emissions can be summarized as follows:

1. Kiln No. 2 operates at a kiln oxygen level normally in the range of 2 to 2.5%. By comparison, Kiln No. 3 normally operates at an oxygen level of approximately 1.0%.

2. Kiln No. 3 is an indirect fired kiln, meaning that the coal fuel and the primary combustion air are delivered to the kiln separately. This allows more control over the combustion air, allowing the combustion air to be varied to obtain optimum combustion conditions and flame characteristics. The air associated with the coal burner normally is not varied. In a wet process cement kiln, the flame characteristics (flame length and intensity) are critical to clinker production.

   In contrast, Kiln No. 2 is a direct fired kiln, which means that the primary combustion air is delivered to the kiln through the coal feed system. In such a system, the amount of combustion air cannot be reduced or varied, because the air velocity through the burner is critical to the flame characteristics.

3. This difference in the two kilns is reflected in the gas flow rates from the kilns. Kiln No. 2, with a maximum clinker production rate of 25 TPH, has an exhaust gas flow rate of 50,000 to 60,000 dscfm. This equates to 2,000 to 2,400 dscfm per ton of clinker produced. Kiln No. 3 normally operates at 87.5 TPH clinker with exhaust gas flow of 140,000 to 160,000 dscfm. This equates to 1,600 to 1,830 dscfm per ton of clinker produced. Therefore, Kiln No. 2 requires approximately 25% more air to operate than Kiln No. 3. This in turn results in a higher oxygen level in the kiln, and hence higher NO_x emissions but lower SO_2 emissions compared to Kiln No. 3.

Continuing Investigation
Based on the above discussion, Tarmac is focusing on reducing the amount of combustion air to the kiln as the only feasible means of lowering NO_x emissions. To this end, Tarmac recently installed a modified coal burner on Kiln No. 2 during the recent outage in April 1996, and again modified the burner in July 1996. The previous coal burner had a 13 inch nozzle, while the new burner will have a 11 inch nozzle. The intention in reducing the nozzle diameter is to reduce the amount of primary air introduced through the coal burner, while maintaining the velocity through the burner obtained by the previous burner design, thus maintaining the previous flame characteristics. The additional emissions test will also be used to determine the effects of the changes upon the grind ability of the clinker product. As discussed above, proper clinker production is dependent upon the flame characteristics.

Tarmac is planning on conducting an additional stack test on Kiln No. 2 with the new burner in late February or early March. This test will further assess the effectiveness and potential in reducing NO_x emissions from Kiln No. 2. The Department will be notified prior to the testing as to the exact test dates. Upon completion of the testing, the test data will be analyzed and submitted to the Department. This analysis, along with analysis of the historic test data as described above, will be submitted to the Department within 45 days of completing the testing.

Please call if you have any questions concerning this status report.

Sincerely,

Mark J. Aguilar for

David A. Buff, P.E.
Principal Engineer
Florida P.E. #19011

SEAL

cc: Al Townsend
Scott Quass
Jim Alves

CC: J. Reynolds, BAR
P. Comer, OGC
T. Tittle, SED
E. Anderson, Dade Co.
B. Beals, EPA

96510024/03

Table A. Summary of NOx/SO2 Emissions From Kiln No. 2, Tarmac Florida

Date	Run#	Kiln Feed (TPH)	Clinker (TPH)	Coal Usage(a) (TPH)	Coal Heating Value(b) (Btu/lb)	Heat Input (MMBtu/hr)	Heat Rate (MMBtu/ton clinker)	Coal Sulfur %	Sulfur Dioxide Emissions ppm	lb/hr	lb/MMBtu	lb/ton kiln feed	lb/ton clinker	Nitrogen Dioxide Emissions ppm	lb/hr	lb/MMBtu	lb/ton kiln feed	lb/ton clinker	Oxygen Level (%) Stack	Kiln	Stack Flow acfm	dscfm
04/26/94	1	39.58	24.08	4.58	13,241	121.29	5.04	1.86	0.63	0.37	0.003	0.009	0.015	1,187	450	3.71	11.37	18.69			86,415	59,855
04/26/94	2	39.58	24.08	4.58	13,241	121.29	5.04	1.86	0.61	0.36	0.003	0.009	0.015	1,092	427	3.52	10.79	17.73			91,144	59,855
04/26/94	3	39.58	24.08	4.58	13,241	121.29	5.04	1.86	0.61	0.35	0.003	0.009	0.015	1,117	422	3.48	10.66	17.52			86,816	57,827
06/28/94	1	38.33	23.6	5.33	13,241	141.15	5.98	1.75	54.18	32.33	0.229	0.843	1.370	610	255	1.81	6.65	10.81			93,138	59,875
08/28/94	2	38.33	23.6	5.33	13,241	141.15	5.98	1.75	108.16	62.76	0.445	1.637	2.659	669	281	1.99	7.33	11.91			90,738	58,286
08/28/94	3	38.33	23.6	5.33	13,241	141.15	5.98	1.75	88.07	51.46	0.365	1.343	2.181	655	282	2.00	7.36	11.95			92,633	58,642
06/28/94	4	38.46	24.0	5.41	13,241	143.27	5.97	1.75						787	332	2.32	8.63	13.83				58,937
08/28/94	5	38.46	24.0	5.41	13,241	143.27	5.97	1.75						579	246	1.72	6.40	10.25				59,280
08/31/94	1	32.8	19.3	4.90	13,241	129.76	6.72	0.85	9.90	5.03	0.039	0.153	0.261	648	237	1.83	7.23	12.28	9.40		78,548	50,967
08/31/94	2	32.8	19.3	4.90	13,241	129.76	6.72	0.85	20.60	10.89	0.084	0.332	0.564	514	195	1.50	5.95	10.10	9.40		80,268	51,988
08/31/94	3	32.8	19.3	4.90	13,241	129.76	6.72	0.85	15.00	7.76	0.060	0.237	0.402	488	182	1.40	5.55	9.43	9.40		78,548	50,967
10/27/94	1	38.9	24.7	5.10	13,241	135.06	5.47	0.76	4.39	2.56	0.019	0.066	0.104	754	316	2.34	8.12	12.79	9.72		115,146	58,456
10/28/94	3	39.8	26.1	5.50	13,241	145.65	5.58	0.76	3.43	1.96	0.013	0.049	0.075	809	333	2.29	8.37	12.76	9.76		115,912	57,531
10/28/94	4	39.8	26.1	5.50	13,241	145.65	5.58	0.76	30.52	16.75	0.115	0.421	0.642	544	215	1.48	5.40	8.24	9.28		113,480	55,094
01/03/95	1	40.5	25.0	4.75	13,278	126.14	5.05	0.88	1.61	0.92	0.007	0.023	0.037	618	255	2.02	6.29	10.19	10.30		91,761	57,583
01/03/95	2	40.5	25.0	4.75	13,278	126.14	5.05	0.88	1.26	0.70	0.006	0.017	0.028	988	398	3.16	9.84	15.93	10.30		88,956	56,308
01/03/95	3	40.5	25.0	4.75	13,278	126.14	5.05	0.88	1.23	0.07	0.001	0.002	0.003	883	354	2.81	8.74	14.16	9.76		89,294	56,002
05/31/95	1	38.5	24.0	5.30	13,278	140.75	5.86	0.67	NA	4.23	0.030	0.110	0.176	923	347	2.46	9.01	14.45	10.70		105,551	52,186
05/31/95	2	38.5	24.0	5.29	13,278	140.48	5.85	0.67	NA	7.26	0.052	0.189	0.303	883	332	2.36	8.62	13.84	11.10		105,918	51,013
05/31/95	3	38.5	24.0	5.29	13,278	140.48	5.85	0.67	NA	1.81	0.013	0.047	0.075	821	322	2.29	8.35	13.40	11.20		107,367	53,963
12/11/95	1	35.0	20.8	5.10	13,278	135.44	6.51		1.51	0.91	0.007	0.026	0.044	728	308	2.28	8.80	14.81	11.00		113,178	59,063
12/11/95	2	35.0	20.8	5.10	13,278	135.44	6.51		1.53	0.91	0.007	0.026	0.044	824	355	2.62	10.14	17.07	11.30		120,039	60,164
12/11/95	3	35.0	20.8	5.10	13,278	135.44	6.51		0.00	0.00	0.000	0.000	0.000	1,044	448	3.31	12.80	21.54	10.90		118,322	59,898
5/31/96	1	35.0	22.1	4.80	12,893	123.77	5.60	1.19	3.90	2.13	0.017	0.061	0.096	547	217	1.75	6.20	9.82	9.80	1.50	113,456	55,435
5/31/96	2	35.0	22.1	4.80	12,893	123.77	5.60	1.19	2.20	1.25	0.010	0.036	0.057						9.70	1.70	118,408	57,881
5/31/96	2-A	35.0	22.1	4.70	12,893	121.19	5.48	1.19						629	261	2.15	7.46	11.81	9.70	1.70		
5/31/98	2-B	35.0	22.1	4.60	12,893	118.62	5.37	1.19						588	244	2.06	6.97	11.04	9.72	1.75		
5/31/96	3	35.0	22.1	4.60	12,893	118.62	5.37	1.19	1.50	0.89	0.008	0.025	0.040	646	267	2.25	7.63	12.08	9.75	1.75	118,041	57,609
5/31/96	4	35.0	22.1	4.50	12,893	116.04	5.25	1.19	1.70	1.02	0.009	0.029	0.046	655	275	2.37	7.86	12.44	9.87	1.90	118,479	58,598
7/31/96	1	27.8	21.9	5.00	12,429	124.29	5.68	0.96						433	177	1.42	6.37	8.08		0.75		56,923
8/01/96	1	32.0	20.7	5.20	12,429	129.26	6.24	1.03	253	147	1.137	4.594	7.101	468	195	1.51	6.09	9.42	9.45	1.00	117,376	58,211
8/01/96	2	32.0	20.7	5.15	12,429	128.02	6.18	1.03	339	193	1.508	6.031	9.324	487	199	1.55	6.22	9.61	9.21	0.70	115,061	57,150
8/01/96	3	32.0	20.7	5.15	12,429	128.02	6.18	1.03	311	181	1.414	5.656	8.744	512	215	1.68	6.72	10.39	9.06	0.50	112,202	58,517
8/01/96	4	32.0	20.7	5.15	12,429	128.02	6.18	1.03	235	133	1.039	4.156	6.425	520	211	1.65	6.59	10.19	9.04	0.60	114,985	56,793
12/18/96	1	32.6	21.0	3.90	13,589	105.99	5.05	1.19	324	183	1.727	5.613	8.714	756	307	2.90	9.42	14.62		1.50		56,751
12/19/96	2	31.0	20.4	3.90	13,589	105.99	5.20	1.19	86	48	0.453	1.548	2.353	721	291	2.75	9.39	14.26		1.50		56,401
12/19/96	3	31.0	20.4	3.90	13,589	105.99	5.20	1.19	295	157	1.481	5.065	7.696	842	323	3.05	10.42	15.83		1.50		53,484
								Number of Tests =	32	32	32	32	32	36	36	36	36	36	25	14	29	35
								Minimum =	0.0	0.0	0.000	0.000	0.000	433	177	1.40	5.40	8.08	9.04	0.50	78,548	50,967
								Average =	68.6	39.3	0.322	1.199	1.863	721	291	2.27	8.05	12.87	9.95	1.31	103,144	56,786
								Maximum =	339.0	193.0	1.727	6.031	9.324	1187	450	3.71	12.80	21.54	11.3	1.90	120,039	60,164
								RACT Limit =		NA			NA		NA	2.00		NA				
								Permit Limit =		195.0			7.8		113.8			4.55				
										275.0 (c)			11.0 (c)		169.3 (c)			6.77 (c)				

(a) As-fired values.
(b) 1996 data based on weekly as-fired coal analysis; all other data based on yearly average coal analysis.
(c) Represents maximum value which limit can be raised to based on test data.

Department of Environmental Protection

Lawton Chiles
Governor

Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Virginia B. Wetherell
Secretary

October 16, 1996

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Mr. Scott Quaas
Environmental Manager
Tarmac America, Inc.
455 Fairway Drive
Deerfield Beach, Florida 33441

RE: NO_X Emissions - Tarmac Kiln No. 2

Dear Mr. Quaas:

This concerns the investigative effort begun by Tarmac over one year ago to determine the reasons for high NO_X emissions from Kiln No. 2 and what can be done about them. KBN's letter of May 28, 1996 stated that Tarmac would conduct tests on a modified coal burner around June 1 and report the results to us within 60 days of test completion. After four months, we have not received any test results.

At some point, the problem will have to be solved by Tarmac or the Department will have to take appropriate action to enforce the existing permit limits. We believe that point should be fast approaching, with the matter being finally resolved one way or the other by the end of this year.

Please give us your immediate assessment of whether the approach currently underway will result in the current NO_X limits being met by early 1997.

If there are any questions regarding the above, please contact John Reynolds or myself at (904)488-1344.

Sincerely,

A. A. Linero 10/16

A. A. Linero, P.E.
Administrator
New Source Review Section

AAL/JR

c: Pat Comer, DEP
Tom Tittle, SED
Ewart Anderson, DCDERM
Brian Beals, EPA
David Buff, KBN

KBN
A GOLDER ASSOCIATES COMPANY

RECEIVED
JUN 5 1996
BUREAU OF
AIR REGULATION

June 4, 1996

Mr. A. A. Linero, Administrator
New Source Review Section
Florida Department of Environmental Protection
2600 Blair Stone Road
Tallahassee, Fl 32399-2400

Re: Investigation of NO_x Emissions
Tarmac Florida, Kiln No. 2

Dear Mr. Linero:

In KBN's letter dated May 28, to you concerning the above referenced subject, Table A and Kiln 2 NO_x data from 1980 were inadvertently omitted. These are attached for your review. Please call if you have any questions concerning this information.

Sincerely,

David A. Buff

David A. Buff, P.E.
Principal Engineer
Florida P.E. #19011

SEAL

DB/arz

cc: Al Townsend
Scott Quass
Jim Alves

cc: J. Reynolds, BAR

9651002A/2

TABLE T-2

MIAMI STACK EMISSION SURVEY

NOX EMISSION RATE - EPA METHOD 7

1980

Run No.	Sample No.	Kiln No.	Fuel Type	Date 1980	Lbs. NO_2 / Hr.	Lbs. NO_2 / Ton Clnk.	Lbs. NO_2 / LB.F.Gas	PPM*
1	1	2	Gas	3-20	211.5	9.95	9.45	435
1	2	2	Gas	3-20	109.1	5.13	4.88	224
1	3	2	Gas	3-20	107.4	5.05	4.80	221
1	4	2	Gas	3-20	101.8	4.79	4.55	209
1	5	2	Gas	3-20	96.7	4.55	4.32	199
1	6	2	Gas	3-20	95.4	4.49	4.26	196
1	7	2	Gas	3-20	91.2	4.29	4.08	188
1	8	2	Gas	3-20	57.1	2.69	2.55	117
1	9	2	Gas	3-20	86.5	4.07	3.87	178
1	10	2	Gas	3-20	89.1	4.19	3.98	183
1	11	2	Gas	3-20	124.5	5.86	5.56	256
1	12	2	Gas	3-20	35.6	1.68	1.59	73
	AVE.				100.5	4.73	4.49	207
2	1	2	Oil	3-21	148.0	5.92	7.64	353
2	2	2	Oil	3-21	125.8	5.03	6.50	300
2	3	2	Oil	3-21	147.7	5.91	7.63	352
2	4	2	Oil	3-21	140.8	5.63	7.27	336
2	5	2	Oil	3-21	143.7	5.75	7.42	343
2	6	2	Oil	3-21	267.6	10.70	13.82	638
2	7	2	Oil	3-21	252.6	10.10	13.05	602
2	8	2	Oil	3-21	114.1	4.56	5.89	272
2	9	2	Oil	3-21	81.4	3.26	4.20	194
2	10	2	Oil	3-21	141.3	5.65	7.30	337
2	11	2	Oil	3-21	217.8	8.71	11.25	519
2	12	2	Oil	3-21	233.5	9.34	12.00	557
	AVE				167.9	6.71	8.66	400

KILN2SU
5/31/96

Table A. Summary of SO2/NOx Emissions From Kiln No. 2, Tarmac Florida

					Heat		Sulfur Dioxide Emissions					Nitrogen Dioxide Emissions					Oxygen Level (%)		Stack Flow	
Date	Run#	Kiln Feed (TPH)	Clinker (TPH)	Coal Usage (TPH)	Input (a) (MMBtu/hr)	Coal Sulfur %	ppm	lb/hr	lb/MMBtu	lb/ton kiln feed	lb/ton clinker	ppm	lb/hr	lb/MMBtu	lb/ton kiln feed	lb/ton clinker	Stack	Kiln	acfm	dscfm
04/26/94	1	39.58	24.08	4.58	114.50	1.86	0.63	0.37	0.003	0.009	0.015	1,187	450	3.93	11.37	18.69			86,415	59,855
04/26/94	2	39.58	24.08	4.58	114.50	1.86	0.61	0.36	0.003	0.009	0.015	1,092	427	3.73	10.79	17.73			91,144	59,855
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06/28/94	3	38.33	23.6	5.33	133.25	1.75	88.07	51.46	0.386	1.343	2.181	655	282	2.12	7.36	11.95			92,633	58,642
06/28/94	4	38.46	24.0	5.41	135.25	1.75						787	332	2.45	8.63	13.83				58,937
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08/31/94	1	32.8	19.3	4.90	122.50	0.85	9.90	5.03	0.041	0.153	0.261	648	237	1.93	7.23	12.28	9.4		78,548	50,967
08/31/94	2	32.8	19.3	4.90	122.50	0.85	20.60	10.89	0.089	0.332	0.564	514	195	1.59	5.95	10.10	9.4		80,268	51,988
08/31/94	3	32.8	19.3	4.90	122.50	0.85	15.00	7.76	0.063	0.237	0.402	488	182	1.49	5.55	9.43	9.4		78,548	50,967
10/27/94	1	38.9	24.7	5.10	127.50	0.76	4.39	2.56	0.020	0.066	0.104	754	316	2.48	8.12	12.79	9.72		115,146	58,456
10/28/94	3	39.8	26.1	5.50	137.50	0.76	3.43	1.96	0.014	0.049	0.075	809	333	2.42	8.37	12.76	9.76		115,912	57,531
10/28/94	4	39.8	26.1	5.50	137.50	0.76	30.52	16.75	0.122	0.421	0.642	544	215	1.56	5.40	8.24	9.28		113,480	55,094
01/03/95	1	40.5	25.0	4.75	118.75	0.88	1.61	0.92	0.008	0.023	0.037	618	255	2.15	6.29	10.19	10.3		91,761	57,583
01/03/95	2	40.5	25.0	4.75	118.75	0.88	1.26	0.7	0.006	0.017	0.028	988	398	3.35	9.84	15.93	10.3		88,956	56,308
01/03/95	3	40.5	25.0	4.75	118.75	0.88	1.23	0.07	0.001	0.002	0.003	883	354	2.98	8.74	14.16	9.76		89,294	56,002
05/31/95	1	38.5	24.0	5.30	132.50	0.67		4.23	0.032	0.110	0.176	923	347	2.62	9.01	14.45	10.7		105,551	52,186
05/31/95	2	38.5	24.0	5.29	132.25	0.67		7.26	0.055	0.189	0.303	883	332	2.51	8.62	13.84	11.1		105,918	51,013
05/31/95	3	38.5	24.0	5.29	132.25	0.67		1.81	0.014	0.047	0.075	821	322	2.43	8.35	13.40	11.2		107,367	53,963
12/11/95	1	35.0	20.8	5.10	127.50		1.51	0.91	0.007	0.026	0.044	728	308	2.42	8.80	14.81	11.0		113,178	59,063
12/11/95	2	35.0	20.8	5.10	127.50		1.53	0.91	0.007	0.026	0.044	824	355	2.78	10.14	17.07	11.3		120,039	60,164
12/11/95	3	35.0	20.8	5.10	127.50		0.00	0.00	0.000	0.000	0.000	1,044	448	3.51	12.80	21.54	10.9		118,322	59,898
						Minimum =	0.00	0.00	0.000	0.000	0.000	488	182	1.49	5.40	8.24	9.28		78,548	50,967
						Average =	19.07	9.97	0.076	0.264	0.429	790	317	2.52	8.37	13.64	10.23		98,246	56,684
						Maximum =	108.16	62.76	0.471	1.637	2.659	1,187	450	3.93	12.80	21.54	11.30		120,039	60,164

(A) Assumes 12,500 Btu/lb coal.
NA = Not available

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3. Article Addressed to:
Scott Quaas, Env. Mgr.
Tarmac America
455 Fairway Dr
Deerfield Bch, Fl
33441

4a. Article Number
P 339 251 169

4b. Service Type
☐ Registered ☐ Insured
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10/18/96

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Postmark or Date: 10/16/96 NOx Emissions Kiln No. 2	

PS Form **3800**, April 1995

KBN
A GOLDER ASSOCIATES COMPANY

May 28, 1996

Mr. A. A. Linero, Administrator
New Source Review Section
Florida Department of Environmental Protection
2600 Blair Stone Road
Tallahassee, FL 32399-2400

RECEIVED
MAY 30 1996
BUREAU OF
AIR REGULATION

Re: Investigation of NO_x Emissions
Tarmac Florida, Kiln No. 2

Dear Mr. Linero:

As you are aware, Tarmac Florida, Inc., is in the process of investigating the high NO_x emissions being experienced from Kiln 2, and potential methods to reduce the emissions. KBN has been contracted by Tarmac to assist them in this manner. The thrust of our efforts has been toward discovering the reasons for the high emissions, and what can be done to reduce the emissions.

This letter presents a status report to the Department, which presents the results of our efforts to date. In addition, additional time is requested in order to perform stack testing to determine if NO_x reduction measures implemented by Tarmac can result in achieving the permitted NO_x limit, or to what extent they can reduce emissions.

Kiln No. 3 Emissions and Basis for Original BACT

The Department has requested that Tarmac investigate why the NO_x emissions from Kiln No. 2 exceed the BACT limit, and why they are so much higher than Kiln No. 3, which was the basis for the BACT. Therefore, a review of the permitting history of the Kiln No. 2 coal conversion PSD permit is in order.

In the original PSD permit application for the Kiln No. 2 coal conversion, Tarmac proposed BACT levels of 400 lb/hr for SO_2 (16 lb/ton clinker) and 169.3 lb/hr for NO_x (6.77 lb/ton clinker) as starting points for the BACT evaluation. This starting point for NO_x was based on the permitted emission limit for Kiln No. 3, which experience had shown was achievable in Kiln No. 3, as well as a limited set of test data from Kiln No. 2 in 1980 when burning fuel oil and gas (see attached data).

It is also important to note that the proposed BACT control technology was good combustion practices and the inherent SO_2 removal within the kiln system. Due to concerns over the nearby PSD Class I area (Everglades National Park), SO_2 emissions were considered to be of much more importance at the time. Subsequently, EPA agreed that BACT for NO_x was good operating and maintenance procedures to minimize NO_x emissions.

In addition, Tarmac proposed and strongly argued that a comprehensive test program be conducted prior to setting any final emission limits for the kiln. This was due to the uncertainty in emissions from Kiln No. 2 versus Kiln No. 3 (due to different size of the kilns and different firing types). Tarmac alluded to a similar experience with Kiln No. 3 when it was converted to coal. An emission limit was agreed to without any test data, and the limit proved to be unattainable. Therefore, the Kiln No. 3 emission limits were revised. Tarmac did not want to make this same mistake again. Tarmac's commitment was to minimize SO_2 emissions to the extent possible, again due to the Class I area concerns. EPA approved the testing plan as a mechanism to set

6241 Northwest 23rd Street, Suite 500, Gainesville, Florida 32653-1500, 352-336-5600 FAX 352-336-6603
5405 West Cypress Street, Suite 215, Tampa, Florida 33607, 813-287-1717 FAX 813-287-1716
1801 Clint Moore Road, Suite 105, Boca Raton, Florida 33487, 407-994-9910 FAX 407-994-9393
7785 Baymeadows Way, Suite 105, Jacksonville, Florida 32256, 904-739-5600 FAX 904-739-7777
1616 'P' Street NW, Suite 350, Washington, DC 20036, 202-462-1100 FAX 202-462-2270

the BACT limit for SO_2 in January 1990. The BACT limit for NO_x was also to be set through the testing program.

The actual test data from Kiln No. 2 shows that the original commitment of minimizing SO_2 emissions to the extent practical has been achieved beyond all expectations. The actual SO_2 emissions are well below the allowable BACT limit. However, as will be discussed in this report, the low SO_2 emissions in effect cause the conversely high NO_x emissions.

Kiln No. 2 NO_x Emissions

In Tarmac's February 1996 submittal to the Department, a summary of NO_x test data for Kiln No. 2 as well as other wet process kilns in the U.S. were presented. There was an error presented in Table 1 of this submittal regarding Tarmac's NO_x emissions (emissions were presented in terms of lb/ton kiln feed rather than lb/ton clinker). Therefore, this table is resubmitted (attached).

A complete summary of the SO_2 and NO_x data obtained to date for Kiln No. 2 is presented in Table A attached. As shown, the SO_2 emissions have been very low, while the NO_x emissions have been high compared to the permitted emission rates. The reasons for this have not been fully determined at this time, but according to plant kiln operators, the SO_2 and NO_x emissions are primarily related to the oxygen level in the kiln. They state that as the oxygen level in the kiln increases, SO_2 emissions decrease while NO_x emissions increase. This trend has also been evident on Kiln No. 3. Therefore, KBN is currently analyzing the available test data for Kiln No. 2 to determine if a correlation exists between these parameters.

During the stack tests on Kiln No. 2, oxygen level at the stack is measured. However, this measurement is affected by infiltration of ambient air into the system and is not reflective of conditions in the kiln. Therefore, oxygen levels in the kiln itself are needed. Tarmac maintains a kiln oxygen monitor on Kiln No. 2, and data from this monitor is archived on-site at the plant. KBN is in the process of retrieving these data, but this is a slow process, since the data are contained on strip charts. Once the data is obtained, correlation plots of oxygen versus emissions will be developed.

Based on the information gathered to date for Kiln No. 2, the reasons for the high NO_x emissions can be summarized as follows:

1. Kiln No. 2 operates at a kiln oxygen level normally in the range of 2 to 2.5 percent. By comparison, Kiln No. 3 normally operates at an oxygen level of approximately 1.0 percent.

2. Kiln No. 3 is an indirect fired kiln, meaning that the coal fuel and the primary combustion air are delivered to the kiln separately. This allows more control over the combustion air, allowing the combustion air to be varied to obtain optimum combustion conditions and flame characteristics. The air associated with the coal burner normally is not varied. In a wet process cement kiln, the flame characteristics (flame length and intensity) are critical to clinker production.

   In contrast, Kiln No. 2 is a direct fired kiln, which means that the primary combustion air is delivered to the kiln through the coal feed system. In such a system, the amount of combustion air cannot be reduced or varied, because the air velocity through the burner is critical to the flame characteristics.

3. This difference in the two kilns is reflected in the gas flow rates from the kilns. Kiln No. 2, with a maximum clinker production rate of 25 TPH, has a exhaust gas flow rate of 50,000 to 60,000 dscfm. This equates to 120,000 to 144,000 dscfm per ton of clinker produced. Kiln No. 3 normally operates at 87.5 TPH clinker with exhaust gas flow of 140,000 to 160,000 dscfm. This equates to 96,000 to 99,000 dscfm per ton of clinker produced. Therefore, Kiln No. 2 requires approximately 25 percent to 45 percent more air to operate than Kiln No. 3. This in turn results in a higher oxygen level in the kiln, and hence higher NO_x emissions but lower SO_2 emissions compared to Kiln No. 3.

Measures to Reduce NO_x Emissions in Kiln No. 2

Based on the above discussion, Tarmac is focusing on reducing the amount of combustion air to the kiln as the only feasible means of lowering NO_x emissions. To this end, Tarmac recently installed a modified coal burner on Kiln No. 2 during a recent outage in April. The previous coal burner had a 13 inch nozzle, while the new burner will have a 10 inch nozzle. The intention in reducing the nozzle diameter is to reduce the amount of primary air introduced through the coal burner, while maintaining the velocity through the burner obtained by the previous burner design, thus maintaining the previous flame characteristics. The test will also be used to determine the effects of the changes upon the grindability of the clinker product. As discussed above, proper clinker production is dependent upon the flame characteristics.

Tarmac is planning on conducting stack testing on Kiln No. 2 with the new burner in late May or early June. This test will assess the effectiveness and potential in reducing NO_x emissions from Kiln No. 2. The Department will be notified prior to the testing as to the exact test dates. Upon completion of the testing, the test data will be analyzed and submitted to the Department. This analysis, along with analysis of the historic test data as described above, will be submitted to the Department within 60 days of completing the testing.

The current construction permit for Kiln No. 2 has an expiration date of May 31, 1996. However, since Tarmac is a Title V source, it is our understanding that this construction permit is automatically extended to the later of November 1, 1996, or 240 days after commencing operation, per Rule 62-213.420(1)(a)4.

Please call if you have any questions concerning this information or the attached report.

Sincerely,

David A. Buff

David A. Buff, P.E.
Principal Engineer
Florida P.E. #19011

SEAL

DB/arz

cc: Al Townsend
Scott Quass
Jim Alves
File (2)

CC: John Reynolds, BAR
EPA
NPS

9651002A/1

KBN

February 16, 1996

RECEIVED

FEB 19 1996

BUREAU OF
AIR REGULATION

Mr. A.A. Linero, Administrator
New Source Review Section
Florida Department of Environmental Protection
2600 Blair Stone Road
Tallahassee, Fl 32399-2400

Re: Investigation of NO_x Emissions
Tarmac Florida, Kiln No. 2

Dear Mr. Linero:

The attached report presents the results of a literature search and survey conducted by KBN Engineering and Applied Sciences, Inc. (KBN) on behalf of Tarmac Florida, Inc. This report is the result of work efforts on Task 1 as described in an October 3, 1995, letter from Jim Alves of Hopping, Green, Sams & Smith to the Department. It is part of Tarmac's ongoing investigation into the high NO_x emissions being experienced from Kiln 2, and potential methods to reduce the emissions.

This report has been delayed from the originally intended date due to a number of reasons, including the Christmas holidays, the EPA shutdown in December and early January, and staff vacations and emergency leave. The report presents a summary of the data gathered by KBN to date. Our data gathering and research efforts on this subject are continuing.

Please call if you have any questions concerning this information or the attached report.

Sincerely,

David A. Buff

David A. Buff, P.E.
Principal Engineer

DAB/lcb

cc: Al Townsend
Scott Quass
Jim Alves
File (2)

9651002B/R1/01

Table 1. Summary of Nitrogen Oxide Emissions from Coal-Fired Wet Process Cement Kilns (Revised 5/28/96)

Source of Emission Factor	Fuel	Type of Firing	No. of Source Tests or CEM Data	Reference	Heat Input Rate (lb/MMBtu)	Clinker Production Rate (tons/hr)	NOx Emissions					
							lb/hr		lb/MMBtu		lb/ton clinker	
							Average	Range	Average	Range	Average	Range
Tarmac Kiln 2 NOx Limit	Coal	Direct	1	1	162.5	25	--	113.8, max	--	0.70, max	--	4.55, max
Tarmac Kiln 3 NOx Limit	Coal	Indirect	1	1	417.5	88	--	592, max	--	1.42, max	--	6.77, max
Tarmac Source Tests: No. 2 Kiln, 1994 and 1995	Coal	Direct	6	2	115-138	19-26	308.8	205 - 417	2.50	1.7 - 3.8	13.1	8.2 - 18.7
Tarmac Source Tests: No. 3 Kiln, 1982 thru 1993	Coal	Indirect	16	3	360-473	79-92	533.0	218 - 855	1.34	0.7 - 2.1	6.2	3.5 - 8.8
Rinker Source Tests: 2 Kilns	Coal	Direct	3	4	352.4	71.4	1,182.3	883 - 1431	3.36	2.5 - 4.1	16.6	12.3 - 20.1
1982 PCA Survey of Coal-fired Wet Process Cement Kilns (b)	Coal	-	8	5	--	--	--	--	--	--	5.0	1.7 - 8.3
Continental Cement Company: June 20, 1990	Coal	Direct	1	6	475.0 (a)	57.0	671.6	--	1.41	--	--	--
Holnam, Inc. CEM Data: July 16, 1992	Coal	Direct	1	7	--	--	--	--	--	--	12.50	--
Holnam, Inc. Source Test: October 24, 1991	Coal	Direct	1	8	--	--	--	--	--	--	5.80	--
Lehigh Portland Cement Company Source Test: May 22, 1990	Coal	Direct	1	9	162.5	--	--	--	1.12	--	5.90	--
AVERAGE							**673.9**		**1.9**		**9.3**	
RANGE							**(309 - 1,182)**		**(1.1 - 3.4)**		**(5.0 - 16.6)**	

Footnotes

(a) Heat input (Btu/hr) is based on burning 100% coal, and any supplemental fuel is added at a rate of 50% of the coal Btu load (i.e., 50% coal Btu/hr, 50% hazardous waste Btu/hr).

(b) Emissions are based on a study of 8 wet process cement kilns firing 100% coal.

References

1. From Permit Allowables for Kiln 2 (AC13-169901 ;PSD-FL-142), and for Kiln 3 .
2. Tarmac Source Tests - No. 2 Kiln: April 26-27, 1994, June 28-29, 1994, August 31, 1994, October 27-28, 1994, January 3, 1995, and May 31, 1995; Medley, Florida.
3. Tarmac Source Tests - No. 3 Kiln: April and May 1982, May 16, 24, 31, and August 1985, December 1986, April and December 1987, July and August 1988, May and August 1989, October 1990, August 1992, and September 1993; Medley, Florida.
4. Rinker Materials Corporation Source Tests: January 1993; Dade County, Florida. Fired with 100% Coal.
5. "An Overview of the Formation of SOx and NOx in Various Pyroprocessing Systems" by Peter Bechtoft Nielsen & Ove Lars Jepsen, F.L. Smidth & Co. A/S, Copenhagen, Denmark. Figure 8.1.
6. "Emissions Testing of a Wet Cement Kiln at Hannibal, Missouri. Draft Final Report." EPA-530-SW-91-017. Continental Cement Company Source Test: June 20, 1990; Hannibal, Missouri. Fired with 100% Coal.
7. "Alternative Control Techniques Document-NOx Emissions from Cement Manufacturing." EPA-453/R-94-004. Holnam, Inc. CEM Data: July 16, 1992; Artesia, Mississippi. Fired with 100% Coal.
8. "Alternative Control Techniques Document-NOx Emissions from Cement Manufacturing." EPA-453/R-94-004. Holnam, Inc. Source Test: October 24, 1991; Florence, Colorado. Fired with 100% Coal.
9. "Alternative Control Techinques Document-NOx Emissions from Cement Manufacturing." EPA-453/R-94-004. Lehigh Portland Cement Company Source Test: May 22, 1990; Cementon, New York. Fired with 100% Coal.

TARMAC FLORIDA, INC.
DEERFIELD BEACH, FL

NITROGEN OXIDE EMISSIONS AND REDUCTION FROM WET PROCESS CEMENT KILNS

LITERATURE SEARCH

KBN Engineering and Applied Sciences, Inc. (KBN) performed an extensive literature search to determine available information on reducing nitrogen oxide (NO_x) emissions from wet process cement. The following sources were contacted to obtain emissions information:

- U.S. Environmental Protection Agency (EPA) Research Triangle Park
- Best Available Control Technology/Lowest Achievable Emission Rate (BACT/LAER) Clearinghouse
- State of California
- Portland Cement Association
- Air Pollutant Control Equipment Vendors
- Suppliers of Coal Burners
- Current Operators of Wet Process Cement Kilns

Refer to the tables in Attachment A for a detailed listing of all sources contacted and the results of each contact. The literature review and information survey focused on actual NO_x emissions from wet process cement kilns, and control techniques employed to reduce NO_x emissions. It is noted that the literature search is ongoing, and additional information is expected to be obtained in the near future.

FACTORS WHICH AFFECT NO_X EMISSIONS

The literature review yielded several pertinent articles related to the formation of NO_x emissions in wet process cement kilns and the factors which affect these emissions. For long, wet kilns which fire only coal, such as Tarmac Kiln 2, the following factors were identified:

1. In wet process kilns firing coal only, the single fuel combustion zone and high temperature required to complete the clinker formation process (2,750°F) lead to high thermal NO_x formation. The major factors are combustion zone temperature,

residence time of combustion gases at the high temperature, the oxygen level in the kiln, and ratio of primary combustion air to secondary air.

2. Energy efficiency of the process is a factor, since a higher heat input requires higher combustion air amounts, leads to higher temperatures, etc.
3. Gas-fired NO_x emissions are generally higher than coal-fired emissions, due to a shorter, more intense flame associated with gas firing (other factors being equal).
4. *Direct firing* is the term used when the primary combustion air is the air swept through the coal mill to deliver the coal to the burner. In *indirect firing*, the primary combustion air is supplied to the kiln independent of the coal supply. Thus, in direct fired kilns, the amount of primary air is large and cannot be adjusted much due to the need to supply the necessary amount of coal at the proper velocity at the burner. In indirect firing systems, the amount of primary air supplied with the fuel is relatively small; therefore, the secondary air amount is higher and can be varied. For these reasons, direct fired kilns generally have higher NO_x emissions than indirect fired kilns.
5. Increasing excess air to the kiln will increase NO_x emissions up to a point, then will decrease emissions due to the reduction in flame temperature. Generally, oxygen levels of 4 to 5 percent result in high NO_x emissions, whereas oxygen levels of 0.5 to 1.5 percent produce low emissions.
6. Coal nitrogen content potentially affects total NO_x emissions: a typical kiln with a heat rating of 5.3 million British thermal units per ton (MMBtu/ton) clinker using a coal with a nitrogen content of 1 percent has the potential to produce fuel NO_x emissions of up to 14.5 pounds per ton (lb/ton) clinker.
7. The nitrogen content of the raw feed is a potential source of NO_x. Raw feed nitrogen levels have been found to vary from 20 to 1,000 parts per million (ppm). A raw feed content of 100 ppm has the potential to produce NO_x emissions up to 1 lb/ton clinker.
8. Other factors which affect wet process cement kiln NO_x emissions include the burnability of the raw feed and sulfur dioxide (SO_2) control employed.

NO_X EMISSIONS FROM WET PROCESS CEMENT KILNS

Based upon information obtained during the literature search and information survey, a compilation of NO_x emissions from wet process coal-fired cement kilns was developed. A summary of this information obtained to date is presented in Tables 1 and 2.

A summary of the NO_x data obtained for coal-only fired wet process kilns is presented in Table 1. Table 2 lists kilns which fire a mixture of coal and other fuels such as waste tires or petroleum coke. Included in Table 1 are Tarmac's present permit limits for Kilns 2 and 3, as well as actual source test data from these kilns. Also included are the test data from Rinker's two wet process kilns, also located in south Florida. As shown, the NO_x emissions data show wide variation, from 4.6 to 17.7 lb/ton clinker produced (average for a kiln). Actual emissions from Tarmac Kiln 2 fall in the lower range of these data at 8.1 lb/ton clinker (average). The average NO_x emission factor from AP-42, Section 11.6, Portland Cement Manufacturing, is 7.4 lb/ton clinker.

CONTROL TECHNIQUES FOR NO_x EMISSIONS

Thermal NO_x dominates NO_x formation in wet process cement kilns. As a result, NO_x emissions from wet process cement kilns can be controlled by two primary methods: combustion techniques and post-combustion technologies. Combustion control technologies are used to modify combustion conditions to reduce flame temperature and available oxygen, and to stage the combustion.

For direct-fired kilns, indirect firing has the potential to reduce NO_x emissions by reducing the available oxygen and staging the combustion, but this reduction must be weighed against the cost of converting and the environmental benefits.

Limited information is available regarding the use of low NO_x burners or flue gas recirculation in cement kilns. Direct fired kilns must be converted to indirect firing prior to use of low NO_x burners.

Post-combustion control technologies for NO_x reduce emissions after they are formed. These methods include: selective non-catalytic reduction (SNCR) and selective catalytic reduction (SCR). SNCR is not considered applicable to wet kilns due to difficulties involved in continuous injection of reducing agents. SCR has not been demonstrated on cement kilns and, therefore, is not considered to be applicable at this time.

The South Coast Air Quality Management District (SCAQMD) has adopted cement kiln best available control technology (BACT) guidelines; however, they do not include wet process cement kilns. The Bay Area Air Quality Management District (BAAQMD) has developed BACT guidance for precalciner kiln systems, not wet process kilns.

REFERENCES

AmTest Air Quality, Inc. 1991. State of Washington, Department of Ecology, Rubber Tire Chip Trial Burn @ Holnam Incorporated Industries, Stack Testing & Chemical Analysis, October 15-19, 1990. Preston, WA.

Hansen, E.R. nd. Panel Discussion: Reduction of Clinker Alkali and SO_2, NO_X Emissions from Preheater Kilns. Ash Grove Cement Company.

McQueen, A.T., S.J. Bortz, M.S. Hatch, H.J. Buening, D.E. Shore, R.L. Leonard, and E.F. Bouse. 1993. Cement Kiln NO_x Control. Radian Corporation, Irvine, CA. 0-7803-0960-X/93.

Mineral Products Industry. 1995. Portland Cement Manufacturing

Nielsen, P.B. and O.L. Jepsen. nd. An Overview of the Formation of SO_x and NO_x in Various Pyroprocessing Systems. F.L. Smidth & Co. A/S, Copenhagen, Denmark

Portland Cement Association (PCA). 1995. U.S. and Canadian Portland Cement Industry: Plant Information Summary. December 31, 1994. Skokie, IL.

U.S. Environmental Protection Agency (EPA). 1984. Combustion Modification Tests on a Subscale Cement Kiln for NO_x Reduction. Industrial Environmental Research Laboratory, Research Triangle Park, NC. EPA-600/S7-84-075.

U.S. Environmental Protection Agency (EPA). 1990. Emissions Testing of a Wet Cement Kiln at Hannibal, Missouri. Draft Final Report. Office of Solid Waste, Washington, DC. EPA/530-SW-91-017.

U.S. Environmental Protection Agency (EPA). 1994. Alternative Control Techniques Document–NO_x Emissions From Cement Manufacturing. Office of Air and Radiation, Office of Air Quality Planning and Standards, Research Triangle Park, NC. EPA-453/R-94-004.

Table 1. Summary of Nitrogen Oxide Emissions from Coal-Fired Wet Process Cement Kilns.

Source of Emission Factor	Fuel	No. of Source Tests or CEM Data	Reference	Heat Input Rate (lb/MMBtu)	Clinker Production Rate (tons/hr)	NOx Emissions lb/hr Average	lb/hr Range	lb/MMBtu Average	lb/MMBtu Range	lb/ton clinker Average	lb/ton clinker Range
Tarmac Kiln 2 NOx Limit	Coal	1	1	162.5	25	--	113.8, max	--	0.70, max	--	4.55, max
Tarmac Kiln 3 NOx Limit	Coal	1	1	417.5	88	--	592, max	--	1.42, max	--	6.77, max
Tarmac Source Tests: No. 2 Kiln, 1994 and 1995	Coal	6	2	115-138	19-26	308.8	205 - 417	2.50	1.67 - 3.78	8.1	6.24 - 10.94
Tarmac Source Tests: No. 3 Kiln, 1982 thru 1993	Coal	16	3	360-473	79-92	533.0	218 - 855	1.34	0.71-2.11	6.2	3.5 - 8.8
Rinker Source Tests: 2 Kilns	Coal	3	4	352.4	71.4	1,182.3	883 - 1431	3.36	2.5 - 4.08	16.6	12.25 - 20.14
1982 PCA Survey of Coal-fired Wet Process Cement Kilns (b)	Coal	8	5	--	--	--	--	--	--	5.0	1.69 - 8.25
Continental Cement Company: June 20, 1990	Coal	1	6	475.0 (a)	57.0	671.6	--	1.41	--	--	--
Holnam, Inc. CEM Data: July 16, 1992	Coal	1	7	--	--	--	--	--	--	12.50	--
Holnam, Inc. Source Test: October 24, 1991	Coal	1	8	--	--	--	--	--	--	5.80	--
Lehigh Portland Cement Company Source Test: May 22, 1990	Coal	1	9	162.5	--	--	--	1.12	--	5.90	--
AVERAGE						639.2		1.6		3.0	
RANGE						(113.8 - 1182.3)		(0.7 - 3.36)		(4.55 - 16.6)	

Footnotes
(a) Heat input (Btu/hr) is based on burning 100% coal, and any supplemental fuel is added at a rate of 50% of the coal Btu load (i.e., 50% coal Btu/hr, 50% hazardous waste Btu/hr).
(b) Emissions are based on a study of 8 wet process cement kilns firing 100% coal.

References
1. From Permit Allowables for Kiln 2 (AC13-169901 ;PSD-FL-142), and for Kiln 3 .
2. Tarmac Source Tests - No. 2 Kiln: April 26-27, 1994, June 28-29, 1994, August 31, 1994, October 27-28, 1994, January 3, 1995, and May 31, 1995; Medley, Florida.
3. Tarmac Source Tests - No. 3 Kiln: April and May 1982, May 16, 24, 31, and August 1985, December 1986, April and December 1987, July and August 1988, May and August 1989, October 1990, August 1992, and September 1993; Medley, Florida.
4. Rinker Materials Corporation Source Tests: January 1993; Dade County, Florida. Fired with 100% Coal.
5. "An Overview of the Formation of SOx and NOx In Various Pyroprocessing Systems" by Peter Bechtoft Nielsen & Ove Lars Jepsen, F.L. Smidth & Co. A/S, Copenhagen, Denmark. Figure 8.1.
6. Continantal Cement Company Source Test: June 20, 1990; Hannibal, Missouri. Fired with 100% Coal.
7. Holnam, Inc. CEM Data: July 16, 1992; Artesia, Mississippi. Fired with 100% Coal.
8. Holnam, Inc. Source Test: October 24, 1991; Florence, Colorado. Firad with 100% Coal.
9. Lehigh Portland Cement Company Source Test: May 22, 1990; Cementon, New York. Fired with 100% Coal.

Table 2. Nitrogen Oxide Emissions From Mixed-Fuel-Fired Wet Process Cement Kilns

Source of Emission Factor	Type of Fuel	No. of Source Tests or CEM Data	Reference	Heat Input Rate (MMBtu/hr)	Clinker Production Rate (tons/hr)	NOx Emissions lb/hr	NOx Emissions lb/MMBtu Average	NOx Emissions lb/MMBtu Range	NOx Emissions lb/ton clinker Average	NOx Emissions lb/ton clinker Range
Holnam Source Tests: October 17-18, 1990	Coal /Coke/Tires	2	1	258.6	50.1	449.9	1.74	1.61 - 1.86	9.0	8.3 - 9.6
Blue Circle, Inc. CEM Data	Coal/Coke	1	2	162.5			1.91		9.38	
Holnam Source Test: October 16, 1990	Coal/Coke	1	3	258.0	50.0	529.2	2.05		10.6	
Holnam, Inc. CEM Data	Coal/Coke	1	4						6.80	
Holnam, Inc. CEM Data: June 28 and July 9, 1992	Coal/Coke (Oil)	2	5						5.50	5.3 - 5.7
LaFarge Corporation Source Test: May 25, 1982	Coal/Coke/WDF	1	6	162.5			0.68		3.60	
Ash Grove Cement Company CEM Data: July 10, 1992	Coal/Coke/WDF/Gas		7	162.5			1.37		9.00	
Continental Cement Company: July 5-6, 1990	Coal/Diesel	2	8	475.0	75.9	218.9	0.46	0.3 - 0.61		
Holnam, Inc. Source Test: June 1992	Coal/Gas	2	9						17.70	15.9 - 19.5
Ash Grove Cement Company CEM Data: July 1992	Coal/LWDF/SWDF	3	10	162.5			2.26	1.97 - 2.58	15.83	13.51 - 18.34
Continental Cement Company: June 21, 1990	Coal/Waste	3	11	475.0	78.6	754.5	1.59			
Holnam, Inc. Source Test: November 21, 1991	Coal/Waste (Gas)	2	12						6.04	6.61 - 5.46
Lone Star Industries CEM Data	Coal/Waste (Oil/Waste)	1	13						5.0	
Holnam, Inc. Source Test: February 10, 1986	Gas (Coal)	1	14						11.60	
AP-42, Section 11.6	Various	6	15						7.4	
AVERAGE						488.1	1.5	0.3 - 2.58	9.0	5.3 - 19.5

Footnotes

(a) Heat input (Btu/hr) is based on burning 100% coal and a heating value of 12,500 lb/MMBTU. Any supplemental fuel is added at a rate of 50% of the coal Btu load (i.e., 50% coal Btu/hr, 50% hazardous waste Btu/hr).

References

1. Holnam Source Tests: October 17-18, 1990; Seatle, Washington. Fired with 44% Coal, 32% Pet Coke, 11% Black Diamond (coal), and 11% tire derived fuel (TDF).
2. Blue Circle, Inc. CEM Data; Ravena, New York. Fired with 40% Coal and 60% Coke.
3. Holnam Source Test: October 16, 1990; Seatle, Washington. Fired with 50% Coal, 37% Pet Coke, and 13% Black Diamond (coal).
4. Holnam, Inc. CEM Data; Artesia, Mississippi. Fired with Coal and Coke.
5. Holnam, Inc. CEM Data: June 28 and July 9, 1992; Holly Hill, South Carolina. Fired with Coal/Coke (Oil).
6. LaFarge Corporation Source Test: May 25, 1982; Paulding, Ohio. Fired with 45.3% Coal, 2.5% Coke, and 52.2% Waste-derived fuel (WDF).
7. Ash Grove Cement Company CEM Data: July 10 & 18, 1992; Foreman, Arizona. Fired with 30% Coal, 7.1% Coke, 61.6% Waste-derived fuel (WDF), and 1.3% gas.
8. Continental Cement Company Source Test: July 5-6, 1990; Hannibal, Missouri. Fired with 50% Coal and 50% diesel.
9. Holnam, Inc. Source Test: June 1992; Ada, Oklahoma. Fired with Coal/Gas..
10. Ash Grove Cement Company CEM Data: July 1992; Foreman, Arizona. Fired with 42% Coal, 42% Liquid waste-derived fuel (LWDF), and 16% Solid waste-derived fuel (SWDF).
11. Continentel Cement Company Source Test: June 21-23, 1990; Hannibal, Missouri. Fired with 50% Coal and 50% hazardous waste.
12. Holnam, Inc. Source Test: November 21and 27, 1991; Morgan, Utah. Fired with Coal/Waste (Gas).
13. Lone Star Industries CEM Data; Greencastle, Indiana. Fired with Coal/Waste (Oil/Waste).
14. Holnam, Inc. Source Test: February 10, 1966; Three Forks, Montanta. Fired with Gas (Coal).
15. AP-42, Table 11.6-8. Emission factor based on 6 stack tests (3 from Tarmac's Medley, Florida facility).

ATTACHMENT A

Attachment A. Literature Search Contacts and Results - Page 1 of 8

Firm/Agency	Contact	Telephone	Results of Conversation
U.S. Environmental Protection Agency; Research Triangle Park, NC	Jim Southerland OAQPS Section Chief	(919) 541-5523	Office closed due to government shutdown.
U.S. Environmental Protection Agency; Research Triangle Park, NC	Ron Myers Project Officer for AP-42, Portland Cement Manufacturing	(919) 541-	
U.S. Environmental Protection Agency; Research Triangle Park, NC	Kristen Roland Library Assistant	(919) 541-2777	She performed a search, but did not find anything. Faxed instructions for accessing On-Line Library System. However, KBN could not access, system error.
San Diego Air Pollution Control District (APCD), Air Permitting Section	Mike Lake Chief of Engineering Division	(619) 694-3313	1-9-96 Left Voice Mail message @ 2:30pm 1-10-96 He had Dan Speer return my call.
San Diego APCD, Air Permitting Section	Dan Speer Senior Engineer	(619) 694-3311	1-10-96 Mike Lake had Dan call me back. He knows of only one wet process cement kiln in California, Riverside Cement in the South Coast Air Quality Management District (AQMD). Also recommended contacting Fred Lettuce there if I cannot find anyone there to help me.
Santa Barbara County, Air Permitting Section	Jerry Scheibe Engineering Supervisor	(805) 961-8800	1-9-96 He will have someone search their database and get back to me. He also recommended contacting SCAQ; CARB, Bob Georges @ (916) 327-5601 for BACT Clearinghouse and Don Coberline @ (916) 327-1505 for BART Clearinghouse; and Bay Area for their BACT databases.
Santa Barbara County, Air Permitting Section	Frances Gilliland Air Quality Specialist	(805) 961-8800	1-9-96 Their district does not have any wet process cement kilns. Suggested contacting Bay Area for their BACT database for guidelines on cement kilns. Also suggested Kern County APCD (805) 861-2593 and South Coast AQMD (909) 396-2000. Faxed a copy of a BACT Guideline Table for Cement Kilns in the Bay Area Air Quality Management District.
South Coast AQMD	Richard Haurylew Air Permit Engineer	(909) 396-2657	1-9-96 Left Voice Mail message @ 4:00pm
South Coast AQMD	Sean Cullins Air Permit Engineer	(909) 396-2655	1-10-96 They have BACT guidelines on dry kiln fired with natural gas. Suggested contacting Jon Henninger, Air Quality and Analysis and Compliance Supervisor @ (909) 396-2278.

Attachment A. Literature Search Contacts and Results - Page 2 of 8

Firm/Agency	Contact	Telephone	Results of Conversation	
South Coast AQMD	Jon Henninger Air Quality & Analysis and Compliance Supervisor	(909) 396-2278	1-10-96	Riverside Cement (white cement) in Riverside @ (909) 683-3660 and Cal Portland Cement (grey cement) in Colton @ (909)... Recommended contacting Dixie Richards @ (909) 396-2395. Richard Thrash @ (909) 396-2397 for each plant, respectively. Also recommended contacting Doug Macauley in the Mojave Desert AQMD for two other cement kilns.
South Coast AQMD	Dixie Richards	(909) 396-2278	1-10-96	Out of office until 1-17-96. Call Hubert Wilson @ (909) 396-2496 for immediate assistance.
South Coast AQMD	Hubert Wilson Air Quality and Analysis Supervisor	(909) 396-2496	1-10-96	Neither Riverside Cement or Cal Portland Cement have wet process cement kilns in this area. He believes that Cal Portland is also in Mojave Desert, but it is a dry process cement kiln. **Suggested that using natural gas (low N2 content) or hydro-treated oil (removes excess H_2 and ammonia from the oil) in place of coal to reduce NO_x.**
South Coast AQMD	Richard Thrash Air Quality Engineer II	(909) 396-2397	1-10-96	Cal Portland Cement is not a wet process cement kiln. Recommended contacting San Bernardino County APCD (619)...
Mojave Desert AQMD	Jim Lehmann Air Quality Engineer III	(619) 245-1846	1-10-96	6-15% reduction of NOx on a BTU basis for dry cement kilns. Activated Sewage Sludge has reduced NOx on a dry kiln. The Cement Industry Environmental Consortion, 1490 Rubidoux Blvd., Riverside, CA 92509 did research testing for sewage additions. Recommended contacting L.L. Afeild @ (909) 683-7349 Fax 686-05703. Marquet Cement Company (out of business, he thinks) in Madison, WI, Ashland, KY, Lone Star, TX (Midland, Dallas). There are only 5 cement kilns in CA, this district only has three. San Bernardino County APCD does not have any wet kilns.
Cement Industry Environmental Consortion	Stretch Mayfield Executive Director	(909) 683-7349	1-10-96	Mitsubishi precalciner (1.5 million ton) in Lucerne Valley added Biosolids to reduce NOx about 40%. Low NOx burners generally hurt the kiln more than helping reduce the NOx.
Calif Air Resources Board (CARB)	Bob Georges BACT Clearinghouse	(916) 327-5601	1-9-96	Out of office until 1-26-96. Voice mail recommended contacting Lars Rydell @ (916) 327-7215.

Attachment A. Literature Search Contacts and Results - Page 3 of 8

Firm/Agency	Contact	Telephone	Results of Conversation	
CARB	Lars Rydell BACT Clearinghouse	(916) 327-5601	1-9-96	Does not have any information on wet process cement kilns. He will double check. Also suggested contacting San Joaquin Valley Unified APCD Seyed Sedredin @ (209) 497-1000 and Ruppie Gil @ (209) 545-7000. Also stated that Don Coberline only works with internal combustion engines and turbines and recommended not contacting for the cement industry.
Bay Area AQMD, Permitting Section	Barry Young Supervising Engineer	(415) 771-6000	1-9-96	He will fax me the Cement Kiln section of the BAAQMD Clean Air Plan which provides the background information for the BACT Guideline Table Frances Gilliland faxed earlier. Also recommended contacting Bobby Nishimura, Supervising Air Quality Engineer @ (415) 749-4679.
Bay Area AQMD, Permitting Section	Bobby Nishimura Supervising Air Quality Engineer	(415) 749-4679	1-9-96	5-10% of kilns may use radioaxial burner (low NOx burners) but do not work well because of the temperatures required for reactions to be completed. There are other EPA documents. Book/Encyclopedia from Portland Cement Association which covers the cement process including control methods, Critical Evaluation of Potential Impacts of Emissions from Midlothian Industries, Summary Report from Texas Natural Resources Conservation Commission. Methanol added with urea to change temperature
Kern County APCD	Mary Flynn Air Quality Engineer	(805) 861-2593	1-9-96	Their district only has dry process cement kilns. She did not know of any wet process cement kilns in use currently. They are not used very much because they are inefficient with fuel usage. She will fax me a list of all the Air Districts in California so I can contact them if necessary.

Attachment A. Literature Search Contacts and Results - Page 4 of 8

Firm/Agency	Contact	Telephone	Results of Conversation	
Portland Cement Association; Skoakie, IL	Ann Dougherty Program Mgr. of Environmental Process Technology	(708) 966-6200 Ext. 363	1-8-96	Ann will be out of the office until Thursday, 1-11-96. Her secretary, Flo Redman, referred me to Greg Miller of Construction Technologies Laboratory.
			1-16-96	Have presentation papers on NOx reductions, but only dry process, not wet process kilns. She recommended contacting Greg Miller at Construction Technologies Laboratory for additional information.
			1-31-96	Left voice mail message @ 10:30am. I would like to get the 1982 PCA survey of NOx emissions from coal-fired cement kilns.
Portland Cement Association; Skoakie, IL	Corinne Guth	(708) 966-6200 Ext. 378	1-8-96	The publication, *U.S. And Canadian Portland Cement Industry Plant Information Summary*, is available for $100 to nonmembers, and Tarmac is not a member. It provides a list of cement plants, location, type of cement kiln located at each plant, type of fuel, but not types of control devices or methods. There are approx. 73 wet process cement kilns presently operating. Suggested contacting Cheryl Solomon, U.S. Bureau of Mines for similar information.
			1-9-86	Ordered the publication listed above and had shipped for overnight delivery
Construction Technologies Laboratory; Skoakie, IL	Greg Miller Senior Principal Scientist	(708) 965-7500 Ext. 522	1-8-96	Write up a fax with my questions and he will get back to me. Probably not by tomorrow.
			1-9-86	Faxed a list of questions and requested the information by Thursday.
			1-16-96	Left voice mail message @ 4:30pm
U.S. Bureau of Mines; Washington, DC	Cheryl Solomon	(202) 501-9393	1-9-96	hours 7:30-5:00, LM @ 11:25am. Offices may be closed due to government shutdown.
Armstrong Cement & Supply Corporation; Cabot, PA	Rick Smith Plant Manager	(412) 352-4471	1-10-96	They have two coal fired wet process cement kilns.
			1-12-96	Left message @ 2:00pm
Armstrong Cement & Supply Corporation; Cabot, PA	Dan Coggins Quality Control Director	(412) 352-4471	1-15-96	Left message @ 11:45am
			1-16-96	Left message @ 4:15pm

Attachment A. Literature Search Contacts and Results - Page 5 of 8

Firm/Agency	Contact	Telephone	Results of Conversation	
Essroc Materials; P.O. Box 779 Bessemer, PA 16112	Alan Fay Process Engineer, E.I.T.	(412) 667-7702 Ext. 311	1-10-96 1-12-96 1-12-96 1-15-96	They have two coal fired wet process cement kilns. He returned my call, but I was not available. Left voice mail message @ 2:00pm Do not have a limit at the present time, but will by the end of the year. Are putting NOx CEMS on per state request by the end of the year to measure the emissions in order to set limits. Recommended contacting Ann Dougherty at Portland Cement Assoc. for more information.
Essroc Materials; Frederick, MD 21702	Lisa Environmental	(301) 662-8244 Ext. 6	1-18-96 1-18-96	They have two coal (waste) fired wet process cement kilns. Left voice mail message @ 5:10pm
Holnam Inc.; Florence, CO	Leo Jurjovec Plant Manager	(719) 784-6325	1-10-96 1-12-96	They have three coal fired wet process cement kilns. Recommended contacting Mark Johnson @ (313) 529-4344 at their corporate office in Dundee, MI.
Holnam Inc.; P.O. Box 122 Dundee, MI 48131	Mark Johnson Manager of Environmental Affairs	(313) 529-4344	1-12-96 1-16-96 1-17-96	Left voice mail message @ 2:00pm He returned my call, but I was not in. I left voice mail message @ 4:00pm Mark requested that I fax (313) 529-2719 a letter to request all the information I need.

Attachment A. Literature Search Contacts and Results - Page 6 of 8

Firm/Agency	Contact	Telephone	Results of Conversation	
Holnam Inc.; Dundee, MI	Rex Jameson Senior Environmental Project Manager	(313) 529-4352	1-19-96	Mark had Rex respond to my fax. European kilns may have NOx control techniques, but they are mostly dry kilns. **Flame temperature reduction to get same heat transfer without as much thermal NOx.** Holnam is adding tires with injection with the coal blown in 2-inch chunks in some of their wet kilns, but probably won't reduce NOx unless added mid-kiln. Also recommended contacting two of their facilities: Steve Otto in Mason City, IA @ (515) 421-3308 and Conrad Fzymczak in Seattle, WA @ (206) 937-8025. Both facilities are firing tires and have NOx permit limits. The Mason City facility only has dry cement kilns. Ash Grove Cement Co. in Foreman, AR is injecting tires into its wet process kiln (mid-kiln). Call to see if they are reducing their NOx levels. Also contact Doug Sweeney (913) 451-8900 in Ashgrove's Corporate office in Kansas City, KS to see if they have any other similar sources.
Holnam Inc.; Seattle, WA	Conrad Fzymczak Environmental Engineer	(206) 937-8025	1-19-96	They have one coal/tire (oil, gas, coke) fired wet process cement kiln. They do not have a permit for NOx. Chipped tires blown in with coal in front of kiln, not specifically for NOx reduction. Recommended contacting Angela Blaisdell at AMTest Air Quality (206) 222-7746 for looking at their test results with and without firing tires. Holnam has two other facilities with wet kilns firing tires. Contact: Kevin Ovard @ (801) 829-6821 in Devil's Slide, UT and Eric Ervin @ (719) 784-6325 in Portland, CO.
AMTest Air Quality; Preston, WA	Angela Blaisdale Vice President	(206) 222-7746	1-19-96	Left message @ 11:00am
AMTest Air Quality; Preston, WA	Jim Guenthoer Senior Air Quality Specialist Jan Alden Senior Technical Writer	(206) 222-7746	1-19-96	Left message @ 11:00am. He returned my call at 12:00pm, but I was not available. I returned call, and spoke with Jan Alden. She will contact Conrad to determine which source test I need and then fax the summary page to our Jacksonville office. She will also mail me a copy.

Attachment A. Literature Search Contacts and Results - Page 7 of 8

Firm/Agency	Contact	Telephone	Results of Conversation	
Holnam Inc.; Devil's Slide, UT	Kevin Ovard Environmental Manager	(801) 829-6821	1-19-96	They have two coal/waste/tire (gas) fired wet process cement kilns. Left message @ 11:55am
Holnam Inc.; 3500 Highway 120 Florence, CO 81226	Eric Ervin Environmental Engineer	(719) 784-6325	1-19-96	They have three coal fired wet process cement kilns. Permitted to burn tires. Fire with coal at front-end of kiln. NOx emissions caused primarily from the coal firing. Firing mid-kiln may or may not make a difference in NOx emissions. Tires have much less nitrogen content; however, lower Tires are used primarily for a less expensive fuel, not NOx reduction. Have stack tests 1. Reduce NOx by flame reduction. Not at this fafacility. 2. Lowering Nitrogen content. Decrease in nitrogen input of fuel by adding tires. Yes at this facility. 3. Thermal NOx is the major constituent of the NOx production. Recommended contacting Doug Sweeney at Ashrove Cement. He will know much more about wet process kilns with tire injection mid-kiln. Similar kilns, even with same dimensions can behave very differently in relation to process characteristics, including NOx emissions. Recommended obtaining "Burning Tires for Fuel and Tire Pyrolysis: Air Implications", EPA-450/3-91-024 does include NOx reduction summary from Holnam's, Seattle, WA wet process cement kiln.
Independent Cement Corporation; Catskill, NY	Charlie Klotz Environmental Manager	(518) 943-4040	1-10-96 1-12-96 1-15-96	They have one coal fired wet process cement kiln. Left voice mail message @ 2:15pm. He returned my call, but I was not available. He is out of office until Wednesday. Call Wed.
Medusa Cement Company; Clinchfield, GA	Randy Stillwell Environmental Engineer	(912) 987-2121	1-10-96 1-15-96	They have one coal fired wet process cement kiln. Have not operated their wet kiln since 1979.

Attachment A. Literature Search Contacts and Results - Page 8 of 8

Firm/Agency	Contact	Telephone	Results of Conversation	
Tarmac Florida; Deerfield Beach, FL	Scott Quass Environmental Manager	(800) 226-8167	1-9-96	He will get existing burner system specs and their suppliers of coal burners.
			1-15-96	Left voice mail message @ 4:00pm.

ATTACHMENT B

Attachment B. Literature Search Articles

Publication	Authors	Recommended NOx Control Techniques
"Alternative Control Techniques Document - NOx Emissions from Cement Manufacturing"; EPA-453/R-94-004	U.S. EPA, OAQPS, ESD	1) Combustion Modifications - Normal operational practices; therefore, not considered a NOx control technique, 2) Low NOx burners, 3) Staged Combustion - May be achieved using Low NOx burners, 4) External Flue Gas Recirculation - Has not been demonstrated for NOx reduction in cement kilns, 5) "Mid-Kiln" Firing of Tires/Waste - Difficult in Wet process kilns, 6) Selective Non-Catalytic Reduction (SNCR) - Preheater/Precalciner kilns only, 7) Selective Catalytic Reduction (SCR) - Limited Pilot plant data available. Low NOx burners may be used to control the available oxygen and temperature of the kiln burning zone which can reduce NOx formation. No flue gas treatment is used in any U.S. cement plant to reduce NOx emissions.
Cement Kiln NOx Control	A.T, McQueen, S.J. Bortz, M.S. Hatch, J.J. Buening, D.E. Shore, R.L. Leonard, E.F. Bouse; Radian Corporation.	1) Combustion Modifications, 2) Low NOx burners, 3) Staged Combustion, 4) Selective Non-Catalytic Reduction (SNCR), 5) Selective Catalytic Reduction .
"An Overview of the Formation of SOx and NOx in Various Pyroprocessing Systems"	Peter Bechtoft Nielsen, Ove Lars Jepsen; F.L. Smidth & Co. A/S, Copenhagen, Denmark.	NOx emissions from wet process kilns are determined exclusively by the conditions in the kiln burning zone. Factors which determine NOx formation in the kiln burning zone: 1) Max. theoretical (adiabatic) flame temperature, 2) Flame shape (burner type), 3) Excess air rate, 4) Max. necessary material temperature, 5) Material retention time in burning zone, and 6) Gas retention time in burning zone. High specific combustion air consumption, low secondary air temperature, and long material retention time in the burning zone should reduce NOx concentration in the exhaust gas of the kiln burning zone. Low NOx burners may be used to control these conditions as well as an automatic kiln control system to maintain constant burning conditions. A 1982 PCA survey of eight wet process coal-fired cement kilns is referenced. The average emission factor from this survey is 4.97 lbs (NOx)/ton (clinker) with a standard deviation of 3.28.

FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION

Department of
Environmental Protection

Lawton Chiles
Governor

Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Virginia B. Wetherell
Secretary

November 20, 1995

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Mr. Albert W. Townsend
Director, Technical Services
Tarmac America, Inc.
455 Fairway Drive
Deerfield Beach, Florida 33441

Re: Permit Extension PSD-FL-142
Pennsuco Cement Kiln No. 2

Dear Mr. Townsend:

The Department reviewed your extension request dated August 30, our discussions on that same date, and a letter from Hopping Green Sams and Smith (HGSS) on your behalf dated October 3, 1995 proposing a new Top-Down BACT determination for nitrogen oxides (NO_X). Please note that there was no agreement to revise the BACT determination or to defer enforcement of the current emission limit.

A revised Top-Down BACT determination is not necessary. The thrust of any effort should be toward discovering the reasons for high emissions and expeditiously achieving compliance with the present BACT limit.

As discussed during our August 30 meeting, we are interested in knowing why NO_X emissions from Kiln No. 2 exceed the BACT limit. We are also interested in knowing why they are so much higher than emissions from Kiln No. 3 which was the basis for the Kiln No. 2 BACT limit. We note that the limit for Kiln No. 3 was determined about 15 years ago and there should be more options available to Tarmac for NO_X control.

Attached is an extension to the construction permit through May 31, 1996 to provide time for further investigation as to the cause(s) of high NO_X emissions and to comply with the NO_X limits for Kiln No. 2.

Mr. Albert W. Townsend
Page Two
November 20, 1995

If you have any questions regarding this matter, please call me or John Reynolds at (904)488-1344.

Sincerely,

A A Linero 11/20

A. A. Linero, Administrator
New Source Review Section

AAL/aal/l

cc: J. Harper
C. Fancy, DEP
J. Pennington, DEP
J. Kahn, SED
T. Tittle, SED
P. Wong, DCDERM
J. Braswell, DEP
J. Alves, HGSS
D. Buff, KBN

FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION

Department of Environmental Protection

Lawton Chiles
Governor

Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Virginia B. Wetherell
Secretary

November 20, 1995

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Mr. Albert W. Townsend
Director, Technical Services
Tarmac Florida, Inc.
455 Fairway Drive
Deerfield Beach, Florida 33441

Dear Mr. Townsend:

Re: Extension of Permit No. PSD-FL-142/Kiln No. 2

The Department received Tarmac's August 30 request for an extension of the expiration date of the above permit. The expiration date is changed as shown below:

From: August 31, 1995

To: **May 31, 1996**

This letter shall become Attachment No. 16 to this permit.

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 (F.S.). 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 applicant of the amendment request/application and the parties listed below must be filed within 14 days of receipt of this amendment. Petitions filed by other persons must be filed within 14 days of the amendment issuance or within 14 days of their receipt of this amendment, whichever occurs first. 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, F.S.

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 the 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 amendment. Persons whose substantial interests will be affected by any decision of the Department with regard to the amendment request/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 receipt of this amendment 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, Florida Administrative Code.

Sincerely,

Howard L. Rhodes

Howard L. Rhodes, Director
Division of Air Resources
Management

HLR/jr/l

cc: J. Harper, EPA
J. Pennington, DEP
I. Goldman, DEP
P. Wong, DCDERM
J. Braswell, DEP
J. Alves, HGSS
D. Buff, KBN

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3. Article Addressed to:
Albert Townsend
Tarmac America, Inc
455 Fairway Dr.
Deerfield Bch. Fl
33441

4a. Article Number
Z 127 632 577

4b. Service Type
☐ Registered ☐ Insured
☒ Certified ☐ COD
☐ Express Mail ☐ Return Receipt for Merchandise

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11/27/95

5. Signature (Addressee)

6. Signature (Agent)

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PS Form **3811**, December 1991 ★U.S. GPO: 1993—352-714 **DOMESTIC RETURN RECEIPT**

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Certified Fee	
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Return Receipt Showing to Whom, Date, and Addressee's Address	
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PCD-F1-142
P. Cement Kiln #2
[illegible]

PS Form **3800**, March 1993

I N T E R O F F I C E   M E M O R A N D U M

Date: 15-Nov-1995 07:34am EST
From: Patricia Comer TAL
COMER_P
Dept: Office General Counsel
Tel No: 904/488-9730
SUNCOM: 278-9730

TO: Alvaro Linero TAL (LINERO_A)

CC: Jeff Braswell TAL (BRASWELL_J)

Subject: RE: FWD: Pennsucco Kiln No. 2 (1)

If you do extend by even one day, the rule extension would take over, but that doesn't necessarily mean that they can blow the problem off. You can't mess around with the automatic extension, but you can approve the pre-Sept 1 extension only if there are some compliance requirements to be met until these guys get their Title V permit. I think they have to come in with their Title V app by June 15 because they are exisiting on Oct 25, 95. The auto extension was intended (at least by me) to apply to "new" facilities that haven't commenced operation by October 25, 95. This facility doesn't meet that requirement. they will have to show how and when they'll come into compliance because we have to have either reasonable assurances or an approvable compliance plan to issue the Title V permit. (Of course, they wouldn't have to worry about that until we actually start processing and they can continue to operate under the construction permit until the Title V permit is issued).

I don't think that Title V fees are of any real significance. I realize that these could accumulate for past payments, but if we didn't bill them, they don't have to pay anyway, so there really isn't any "past fee" consideration. The statute and rule both say, "specific condition of the source's most recent construction or operation permit" so I don't know why they wouldn't be billed. Ask John Brown about that.

I don't do litigation anymore, so I hesitate to recommend any particular action that might affect (or even effect) litigation, but I thought BACT was close to sacred cow status,-- not to be altered once esteblished, so I'd be curious to know why a BACT limit that was presumably OK when they wanted to construct is suddenly not OK when they want to operate. I'd also be curious to know what Barry expected when he did the BACT. I know I was involved with this once, but I'm an attorney not an engineer, so I make no judgment about BACT limits.

I N T E R O F F I C E   M E M O R A N D U M

Date: 13-Oct-1995 08:36am EST
From: Alvaro Linero TAL
LINERO_A
Dept: Air Resources Management
Tel No: 904/921-9532
SUNCOM: 291-9532

TO: Patricia Comer TAL (COMER_P)

CC: John Reynolds TAL (REYNOLDS_J)
CC: Jeff Braswell TAL (BRASWELL_J)

Subject: Pennsucco Kiln No. 2 (1)

Pat. Please refer to attached draft letter in response to a request from Tarmac to extend the expiration date for construction (actually modification to convert to coal) at Kiln No. 2, Pennsucco Cement, Miami, Florida.

The issues are:

- o Tarmac has been operating since the conversion under the construction permit which, after several extensions, expired on August 31, 1995.

- o They requested another extension before the previous one expired.

- o They submitted a Certificate of Completion to the District at least one year ago.

- o They have not been able to comply with the Department's BACT Determination for NO_X (4.55 lbs/ton of clinker) or the "window" allowed by the stipulation agreed to by Tarmac and DEP (4.55-6.77 lbs/ton). If their compliance tests fell within the window, we were to reset our BACT to a level higher than our determination.

- o The District has not revised the facility operating permit, presumably because they have not demonstrated compliance with the NO_X limit.

- o Through HGSS, they submitted a plan (I faxed to you) to arrive at an "endpoint" on these matters. We don't see a commitment to meet our BACT limit in their endpoint.

- o If we extend by a single day, we wonder if they get an automatic subsequent extension through the new DEP rule which automatically extends construction permit to September 1996 (if they are due to expire after September 1, 1995.

- o If they continue to operate on their construction permit, we wonder if they don't have to pay Title V fees (because present operating permit has no NO_X limits). They were already avoiding Title V fees which should have accrued from the PSD BACT NO_X limit on <u>Kiln No. 3</u> which was never rolled over into the operating permit by the SED. The losses to the Title V program are roughly $100,000 over the years.

- Any compliance/enforcement issues will be handled separately.

- We might be willing to extend the permit but only to allow time for them to comply - not to just produce reports.

- Can you comment on the attached draft letter - particularly on any right we have to consider the extension to be the operating permit for the purpose of Title V fees?. After all the automatic extension are in lieu of operating permits.

- Can we limit the automatic (rule -based) extension due to non-compliance? At least can we put conditions on the automatic extension?

We want to respond very soon. Can you handle any interactions with HGSS? I told them (when they called me to say they were going to send their letter) that I preferred they interact with OGC on these matters. Right now I only see a need to tell Tarmac what our intent is and copy HGSS and KBN.

INTEROFFICE MEMORANDUM

Date: 09-Oct-1995 03:39pm ES
From: John Reynolds TAL
REYNOLDS_J
Dept: Air Resources Manageme
Tel No: (904)488-1344
SUNCOM: 278-1344

TO: Alvaro Linero TAL (LINERO_A)

Subject: Tarmac Memo Dated Oct. 3, 1995

I don't recall that we agreed to a BACT "re-determination" as Jim Alves implied. We said we would like more information regarding why the NOx numbers were so high relative to Kiln No. 3, but we didn't say we would use that information to redetermine BACT.

I suggest we respond with the following:

"This is in response to your letter dated October 3. As indicated during the Tarmac meeting on August 30, the Department would like more information as to why the NOx emissions from Kiln No. 2 exceed the BACT limit and why they are so much higher than Kiln No. 3 which was the basis for the Kiln No. 2 BACT limit. However, please understand that no agreement has been made to revise the BACT determination or to avoid enforcement of the current emission limit.

Rather than spending a lot of time and money developing an extensive report on various wet kiln technologies geared toward a revised BACT, Tarmac should be zeroing in on specific peculiarities of Kiln No. 2 affecting NOx emissions, perhaps conducting additional testing with another burner and/or employing kiln/burner design consultants to see if the problem can be solved through non-major physical/operational modifications. The Department will agree to a 7-month time period to accomplish this, which means that Tarmac must present evidence of its modification investigation and the results to the Department by May 15, 1996. "

HOPPING GREEN SAMS & SMITH
PROFESSIONAL ASSOCIATION
ATTORNEYS & COUNSELORS
123 SOUTH CALHOUN STREET
POST OFFICE BOX 6526
TALLAHASSEE, FLORIDA 32314
(904) 222-7500
FAX (904) 224-8551
FAX (904) 425-3415

WRITER'S DIRECT DIAL NO.
425-2360

October 3, 1995

VIA HAND DELIVERY

Mr. Al Linero
New Source Review Section
Florida Department of Environmental Protection
111 S. Magnolia Avenue, Suite 4
Tallahassee, FL 32302

RE: Tarmac Florida, Inc.
Kiln No. 2

Dear Al:

As discussed by telephone last month, Tarmac Florida requests that in addition to extending the expiration date of its PSD permit, DEP also include, as a minor modification, a schedule for resolving the pending issues concerning the final BACT determination for NOx. More specifically, this schedule would consist of the following three steps in development and consideration of pertinent information:

(1) January 15, 1996 -- KBN to complete and submit to DEP results of a literature search compiling available information related to NOx emissions and NOx control technologies potentially applicable to wet process kilns. The results will be provided in narrative, tabular, and graphic format, as indicated from the data. The following potential sources of information will be consulted: EPA (Research Triangle Park Regional Offices, and BACT Clearinghouse); State of California; Portland Cement Association; air pollution control equipment vendors; supplies of coal burners; and sources operating NOx control systems on wet process kilns.

(2) April 15, 1996 -- KBN to prepare and to submit a report addressing technically feasible NOx control technologies applicable to wet process cement kilns along

with economic evaluations of feasible alternatives. With respect to technical feasibility, an engineering analysis will be conducted of the cement kiln process, process variables, and factors affecting NOx emissions. Areas investigated will include the species of NOx generated, the formation steps in the kiln, and the potential magnitude and species of NOx formed. Both Tarmac's cement kiln and other operating wet process cement kilns may be visited during this task, to assess the feasibility of various technologies. A written discussion of the results will be provided, along with supportive tables, graphs, etc. With regard to the economic evaluation of the technically feasible alternative control technologies, capital and annual operating costs will be developed for each alternative, and the total and incremental cost effectiveness for each will be determined. Costs will be based upon vendor information and standard cost estimating procedures published by EPA.

(3) May 15, 1996 -- Based on the results of the economic evaluation and other information gathered during the study, KBN's BACT recommendation will be submitted. This recommendation will follow the EPA's "top-down" approach for determining BACT. A report describing the information and analysis gathered in all tasks will be developed for presentation to the Department. A meeting with the Department will be convened to present the results of the study and to discuss the analysis.

This process would facilitate the orderly development of relevant information, and allow DEP and Tarmac to address and evaluate pertinent questions in a systematic manner. Certainly a major advantage to this requested permit modification is that it identifies an endpoint to negotiations on this issue.

Please let me know at your earliest convenience whether this suggestion is acceptable to DEP. Of course, David Buff of KBN and I would be pleased to answer any questions regarding this proposal.

Very truly yours,

Jim

James S. Alves

JSA:lb

I N T E R O F F I C E   M E M O R A N D U M

Date: 30-Aug-1995 05:48pm EST
From: Alvaro Linero TAL
LINERO_A
Dept: Air Resources Management
Tel No: 904/921-9532
SUNCOM: 291-9532

TO: Patrick Wong MIAMI (WONG_P @ A1 @ EPIC66)

CC: Thomas Tittle WPB (TITTLE_T @ A1 @ WPB1)

Subject: Tarmac Kiln 2 Coal Conversion

Today we met with Tarmac. They have been unable to meet their PSD limit on Kiln 2 for NO_x following the coal conversion project. They are unable to meet the limit of 4.55 lb NO_x/ton of clinker. In fact, after a year-long test program, they have been unable to meet a level between 4.55 and 6.77 lb/ton which according to condition 12 of AC 13-169901, PSD-FL-142 would make them eligible for a lower limit. This condition was in there as a result of a stipulation with OGC which resulted in Tarmac dropping a hearing request at the time the psd permit was issued.

They request a revision of the BACT/permit limit to 11 lb/ton. They have reasons and are trying to get together an explanation. This will take a long time to resolve. They have requested from us another extension of their construction permit in the meantime. I believe however that they submitted a Certificate of Completion long ago.

This is to alert you of the situation. The permit conditions remain in force regardless of any possible future changes in the NO_x limit. Please use your procedures for handling this kind of case.

I N T E R O F F I C E   M E M O R A N D U M

Date: 29-Aug-1995 12:33pm EST
From: Patricia Comer TAL
COMER_P
Dept: Office General Counsel
Tel No: 904/488-9730
SUNCOM: 278-9730

TO: John Reynolds TAL (REYNOLDS_J)

CC: Alvaro Linero TAL (LINERO_A)

Subject: RE: Tarmac

you raise a good point about the legal argument, but I'd like you to not raise the legal arguments at tomorrow's meeting, since neither Jim Alves nor I will be there. there's probably plenty of scope for discussion in the why-they- didn't-meet-their-BACT and how-they-can-meet-it issues. Thanks

I N T E R O F F I C E   M E M O R A N D U M

Date: 29-Aug-1995 12:26pm ES
From: John Reynolds TAL
REYNOLDS_J
Dept: Air Resources Manageme
Tel No: (904)488-1344
SUNCOM: 278-1344

TO: Patricia Comer TAL (COMER_P)

CC: Alvaro Linero TAL (LINERO_A)

Subject: Tarmac

Correction, I should have said "meet the BACT limit of 1.04 lb/MMBTU" which represents the top of their proposed range.

I N T E R O F F I C E   M E M O R A N D U M

Date: 29-Aug-1995 11:29am ES
From: John Reynolds TAL
REYNOLDS_J
Dept: Air Resources Manageme
Tel No: (904)488-1344
SUNCOM: 278-1344

TO: Patricia Comer TAL (COMER_P)

CC: Alvaro Linero TAL (LINERO_A)

Subject: Tarmac

Pat,

In our opinion (let us know if we're wrong), Tarmac is legally estopped from any further "petitioning" (i.e. formal or informal) since they dismissed their 1990 action after the Department adopted their proposed ranges for reevaluation. Looks like their options are: 1) meet the RACT limit of 2.0 lb/MMBTU somehow, 2) get a variance for two years, 3) shut 'er down, 'nuff said.

Any comments 'fore the shootin' starts?

Tarmac

Tarmac America, Inc.
455 Fairway Drive
Deerfield Beach, FL 33441
Telephone: 305.481.2800
Facsimile: 305.480.9352

HAND DELIVERED

30 August 1995

Mr. A. A. Linero, P.E.
Administrator – New Source Review
Fla. Dept. Of Environmental Protection
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

RE: **Pennsuco Cement Plant**
Dade County - AP
Kiln No. 2 Coal Conversion
FDEP Permit No. AC13-169901 [PSD-FL-142]

Dear Mr. Linero:

I am in receipt of your letter dated August 24, 1995 regarding my recent extension request for the above referenced permit. I have enclosed a check in the amount of $250.00 [check# 207080] for the required processing fee. Your comment regarding Tarmac's statement in a letter dated April 24, 1995 is noted. However, the submittal of an operation permit application would be premature in view of the requested reevaluation of the NO_x emission limits. We will discuss those matters at our meeting scheduled for this date.

Sincerely,

Scott Quaas
Environmental Manager
Technical Services–Florida Region

Department of Environmental Protection

Lawton Chiles
Governor

Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Virginia B. Wetherell
Secretary

August 24, 1995

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Mr. Scott Quaas
Environmental Manager
Tarmac America, Inc.
455 Fairway Drive
Deerfield Beach, FL 33441

Dear Mr. Quaas:

The Department received your July 21 letter on July 25 requesting another extension of the construction permit for the Kiln No. 2 coal conversion (PSD-FL-142). It was also requested that the NO_x emission limit be increased by a factor of four.

Regarding the extension request, the required processing fee would have to be submitted before the Department could consider granting another one. We note that Tarmac stated in a letter dated April 24, 1995, that its operation permit would be ready for submittal by July 24, 1995.

As far as Tarmac's proposed NOx limit is concerned, it is not representative of the Best Available Control Technology required under the Prevention of Significant Deterioration rules. Also, the NOx test results are beyond the range of values for reevaluation set by Tarmac in the Stipulation for Dismissal of Tarmac's 1990 hearing petition.

As you requested, we will meet on August 30 at 1:30 p.m. to hear further input regarding this matter. We believe that the discussion should center on physical or operational changes that may be necessary to meet the NOx limits in Tarmac's present permit. If further questions or issues arise before August 30, please call John Reynolds at 904-488-1344.

Sincerely,

A A Linero 8/24

A. A. Linero, P.E.
Administrator
New Source Review

CHF/JR/t
cc: P. Comer, OGC
E. Anderson, DCDERM
S. Brooks, SED
D. Buff, P.E.

"Protect, Conserve and Manage Florida's Environment and Natural Resources"

[redacted]

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Consult postmaster for fee.

3. Article Addressed to: Scott Quaas, EM. Tarmac America, Inc. 455 Fairway Dr Deerfield Bch, Fl 33441	4a. Article Number Z 392 979 032
	4b. Service Type ☐ Registered ☐ Insured ☒ Certified ☐ COD ☐ Express Mail ☐ Return Receipt for Merchandise
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5. Signature (Addressee)	8. Addressee's Address (Only if requested and fee is paid)
6. Signature (Agent)	

PS Form 3811, December 1991 ☆U.S. GPO: 1993—352-714 DOMESTIC RETURN RECEIPT

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Return Receipt Showing to Whom, Date, and Addressee's Address	
TOTAL Postage & Fees	$
Postmark or Date 8-25-95 PSO-Fl-142	

PS Form 3800, March 1993

Tarmac

Tarmac America, Inc.
455 Fairway Drive
Deerfield Beach, FL 33441
Telephone: 305.481.2800
Facsimile: 305.480.9352

CERTIFIED MAIL - RRR
Z 056 630 742

21 July 1995

RECEIVED
JUL 25 1995
Bureau of Air Regulation

Mr. Clair Fancy, P.E.
Chief – Bureau of Air Regulation
Fla. Dept. Of Environmental Protection
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

RE: **Pennsuco Cement Plant**
Dade County - AP
Kiln No. 2 Coal Conversion
FDEP Permit No. AC13-169901 [PSD-FL-142]

Dear Mr. Fancy:

Tarmac has completed the series of compliance tests outlined in specific condition 12. of the referenced permit. The permit allows for a re-evaluation of BACT and consideration of up-ward adjustments of the emission limitations based on the test data. The following table summarizes the data for the six (6) stack emission tests.

Test Date	Kiln ‡ Feed [dry]	Clinker ‡ Production	Coal		Sulfur Dioxide	Sulfuric Acid Mist	Nitrogen Oxides	Carbon Monoxide	VOC's	Particulate Matter	PM10
			tons/hr	%S							
4/26-27/94	39.6	24.1	4.6	-	0.36	0.07	417.32	9.73	1.00	13.26	11.27
6/28-29/94	38.4	23.8	5.4	-	48.85	-	279.08	-	-	-	-
8/31/94	32.8	19.3	4.9	-	7.89	3.60	204.53	-	-	-	-
10/27-28/94	38.9	24.7	5.1	0.79	5.94	-	287.92	-	-	-	-
1/3/95	37.1	23.0	4.8	0.88	0.77	0.91	335.71	-	-	-	-
5/31/95	38.5	24.0	4.8	0.85	4.43	2.27	328.40	14.70	4.30	7.25	6.16
AVERAGE	37.6	23.2	4.9	0.84	11.37	1.71	308.83	12.22	2.65	10.26	8.72

[all test results in lbs/hr]
‡ tons/hour

Two (2) points become quickly apparent. [1] SO_2 emissions averaged a factor of 15 times less than the permitted limitations, and for that matter, anticipated in the original permit application; [2] NOx emissions averaged and a factor of 2 times the upper level of the re-evaluation window. The NOx emissions while unexpected do reflect the lack of uncertainty expressed by Tarmac during the initial permit review. The NOx emissions also confirm the inadequacy of the BACT/LEAR clearinghouse data for NOx emissions from portland cement manufacturing facilities; specifically wet process plants. The NOx emissions test data reflects real-time operating conditions and the considerable variation in NOx emissions. All reasonable efforts were made to limit the air emissions during the testing and evaluation period.

In view of the test results, Tarmac respectfully requests an extension of the expiration date of the referenced permit from August 31, 1995 until inclusion in the Title V permit. Tarmac also requests the NOx emission limitations be re-evaluated and adjusted to the following limits.

Pollutant	Emission Limit	Equivalent Limit	Equivalent Limit
NOx	11.0 lbs/ton kiln feed (dry)	2.7 lbs/MMBtu	445.0 lbs/hour

The proposed adjusted limit is the 95 percentile emission rate based on the data from the testing. Additionally, the proposed adjusted limit equates to only 62 percent of the NOx RACT limit of 4.4 pounds per MMBtu proposed for wet process cement kilns.

I believe a meeting is essential to fully discuss the emission test results and the requested emission limitation adjustment. I will call you in the near term to schedule a meeting at your convenience. Should you require anything further prior to a meeting please call me at (800) 330-3380 x4165.

Sincerely,

Scott Quaas
Environmental Manager
Technical Services–Florida Region

cc: R. Pluta
A. Townsend
B. Smith
F. Goudie
D. Buff–KBN Engineering
J. Alves–HGS&S
FDEP–W.Palm Beach

Department of Environmental Protection

Lawton Chiles
Governor

Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Virginia B. Wetherell
Secretary

June 15, 1995

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Mr. David A Buff, P.E.
Principal Engineer
KBN Engineering and Applied Sciences, Inc.
6241 N.W. 23rd Street - Suite 500
Gainesville, FL 32653-1500

Re: Petcoke Project
Tarmac Florida, Inc.
A013-238048

Dear Mr. Buff:

Your letter of May 19, 1995 was forwarded to this office by the Southeast District. They cannot amend the Operating Permit as requested until any underlying construction permits are modified to provide for utilization of petroleum coke.

The scenario described in your letter indicates no increase in sulfur dioxide (SO_2) emissions if the proposed petcoke/coal blend has a sulfur content equal to the maximum allowed sulfur content of the presently-used coal. It is still necessary to compare the future potential emissions of regulated pollutants affected by the change with present actual emissions. The latter are based on what emissions have been in recent years instead of what they could have been.

Because of its high vanadium content, petcoke usage results in higher sulfuric acid mist emissions even if sulfur content remains constant. This is because of catalytic oxidation of SO_2 to sulfur trioxide in the presence of vanadium. Since acid mist is a pollutant subject to Prevention of Significant Deterioration (PSD) analysis, it is necessary to know the effects of the operational change on actual emissions for this pollutant. It should also be substantiated that the additional vanadium and nickel found in petcoke will indeed be retained in the clinker or control equipment.

We recommend you take a second look at the proposed project. At a minimum it will require modification of existing construction permit(s) and engineering calculations showing the changes in all pollutants affected by the change. It may be necessary to conduct a trial burn, if information is not already available for emissions predictions.

If you have any questions regarding this matter, please call me or John Reynolds at (904)488-1344.

Sincerely,

6/15

A.A. Linero, P.E.
Administrator, New
Source Review

AAL/aal/l

cc: Stephanie Brooks, SED

Fold at line over top of envelope to the

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- Complete items 3, and 4a & b.
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1. ☐ Addressee's Address
2. ☐ Restricted Delivery

Consult postmaster for fee.

3. Article Addressed to:
David A. Buff, P.E.
KBN Engineering + Applied Sc.
6241 NW 23rd St. Suite 500
Gainesville, Fl 32653-1500

4a. Article Number
Z 311 902 901

4b. Service Type
☐ Registered ☒ Certified ☐ Express Mail ☐ Insured ☐ COD ☐ Return Receipt for Merchandise

7. Date of Delivery
6-1995

5. Signature (Addressee)

8. Addressee's Address (Only if requested and fee is paid)

6. Signature (Agent)
M Reinert

PS Form 3811, December 1991 ☆U.S. GPO: 1993—352-714 **DOMESTIC RETURN RECEIPT**

Thank you for using Return Receipt Service.

Z 311 902 901

UNITED STATES POSTAL SERVICE

Receipt for Certified Mail
No Insurance Coverage Provided
Do not use for International Mail
(See Reverse)

PS Form 3800, March 1993

Sent to David Buff	
Street and No. KBN Engineering	
P.O., State and ZIP Code Gainesville, Fl	
Postage	$
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt Showing to Whom & Date Delivered	
Return Receipt Showing to Whom, Date, and Addressee's Address	
TOTAL Postage & Fees	$
Postmark or Date Petecke Talmac AO13-238048 AC13-16990	

at

Tarmac

RECEIVED

MAY 22 1995

Bureau of Air Regulation

TARMAC FLORIDA, INC.

455 Fairway Drive
Deerfield Beach, Florida 33441

Telephone:
Deerfield Beach (305) 481-2800

CERTIFIED MAIL - RRR
Z 056 630 722

17 May 1995

Ms. Stephanie Brooks, P.E.
Supervisor - Air Resource Management
Fla. Dept. Of Environmental Regulation
P.O. Box 15425
W. Palm Beach, Florida 33416

RE: Pennsuco Cement Plant
Dade County - AP
Kiln No. 2 Coal Conversion
FDEP Permit No. AC13-169901

Dear Ms. Brooks:

Please be advised that the sixth and last stack emission test in accordance with the test protocol specified in the above permit is scheduled for May 31, 1995. As previously notified, the test was delayed due to the kiln being shut-down during March and April for repair. By copy of this letter, the DERM is also formally notified of the scheduled test. Should you have any questions please call me at (800)330-3380 x4165.

Sincerely,

Scott Quaas
Environmental Manager
Technical Services

cc: A. Townsend
R. Pluta
E. Anderson - DERM
C. Fancy - FDEP, Tallahassee

FLORIDA

Department of Environmental Protection

Lawton Chiles
Governor

Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Virginia B. Wetherell
Secretary

May 8, 1995

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Mr. Albert W. Townsend
Director, Technical Services
Tarmac Florida, Inc.
455 Fairway Drive
Deerfield Beach, Florida 33441

Dear Mr. Townsend:

Re: Extension of Permit No. PSD-FL-142/Kiln No. 2

The Department received Tarmac's April 7 letter requesting an extension of the expiration date of the above permit. The expiration date is changed as shown below:

From: December 31, 1993

To: **August 31, 1995**

This letter shall become Attachment No. 15 to this permit.

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 (F.S.). 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 applicant of the amendment request/application and the parties listed below must be filed within 14 days of receipt of this amendment. Petitions filed by other persons must be filed within 14 days of the amendment issuance or within 14 days of their receipt of this amendment, whichever occurs first. 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, F.S.

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 the 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 amendment. Persons whose substantial interests will be affected by any decision of the Department with regard to the amendment request/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 receipt of this amendment 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, Florida Administrative Code.

Sincerely,

Howard L. Rhodes

Howard L. Rhodes, Director
Division of Air Resources
Management

HLR/jr/t

cc: I. Goldman, SED
D. Buff, P.E.
J. Harper, EPA
E. Anderson, DERM

Z 311 902 930

Receipt for Certified Mail

No Insurance Coverage Provided
Do not use for International Mail
(See Reverse)

UNITED STATES POSTAL SERVICE

PS Form 3800, March 1993

Sent to Mr Albert W Townsend	
Street and No. 455 Fairway Dr	
P.O., State and ZIP Code Deerfield Beach, FL 33441	
Postage	$
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt Showing to Whom & Date Delivered	
Return Receipt Showing to Whom, Date, and Addressee's Address	
TOTAL Postage & Fees	$
Postmark or Date Mailed 5/5/95	

BEST AVAILABLE COPY

Department of Environmental Protection

Lawton Chiles
Governor

Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Virginia B. Wetherell
Secretary

May 3, 1995

Mr. Scott Quaas
Environmental Manager
Technical Services
Tarmac Florida, Inc.
455 Fairway Drive
Deerfield Beach, Florida 33441

Re: Pennsuco Cement Plant Kiln No. 2 Coal Conversion
FDEP Permit No. AC13-169901, PSD-FL-142

Dear Mr. Quaas:

The Department has reviewed your letter of April 24 and will act on your original request of October 1, 1993, to extend the referenced construction permit.

Unfortunately, your letter to the Southeast District dated March 28, 1994, did not reference your extension amendment request, nor indicate any other action for the Tallahassee office. The letter with the Certificate of Completion indicated that construction was finished and we inferred that there was no need to act on the extension request.

Because the Certificate of Completion satisfies our requirement that Tarmac "show that construction has commenced," we will act on the extension. However, you must submit a timely and complete Title V permit application to the Southeast District at least sixty days prior to expiration of the extended construction permit.

If you have any questions regarding this matter, please call A. A. Linero at 904/488-1344.

Sincerely,

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

CHF/ch

cc: A. A. Linero
Stephanie Brooks
Patrick Wong

Is your RETURN ADDRESS completed on the reverse side?

SENDER:
- Complete items 1 and/or 2 for additional services.
- Complete items 3, and 4a & b.
- Print your name and address on the reverse of this form so that we can return this card to you.
- Attach this form to the front of the mailpiece, or on the back if space does not permit.
- Write "Return Receipt Requested" on the mailpiece below the article number.
- The Return Receipt will show to whom the article was delivered and the date delivered.

I also wish to receive the following services (for an extra fee):

1. ☐ Addressee's Address
2. ☐ Restricted Delivery

Consult postmaster for fee.

3. Article Addressed to:
Scott Quaas, Env. Mgr
Tarmac Fla. Inc.
455 Fairway Dr.
Deerfield Bch, Fl
33441

4a. Article Number
Z 311 902 926

4b. Service Type
☐ Registered ☐ Insured
☒ Certified ☐ COD
☐ Express Mail ☐ Return Receipt for Merchandise

7. Date of Delivery
5/5/95

5. Signature (Addressee)

6. Signature (Agent)

8. Addressee's Address (Only if requested and fee is paid)

PS Form 3811, December 1991 ☆U.S. GPO: 1993—352-714 **DOMESTIC RETURN RECEIPT**

Thank you for using Return Receipt Service.

Z 311 902 926

UNITED STATES POSTAL SERVICE

Receipt for Certified Mail
No Insurance Coverage Provided
Do not use for International Mail
(See Reverse)

PS Form 3800, March 1993

Sent to Scott Quaas	
Street and No. Tarmac Fla, Inc	
P.O., State and ZIP Code Deerfield Bch, Fl	
Postage	$
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt Showing to Whom & Date Delivered	
Return Receipt Showing to Whom, Date, and Addressee's Address	
TOTAL Postage & Fees	$
Postmark or Date 5-3-95 AC13-169901 PSD-F1-142	

TARMAC FLORIDA, INC.

455 Fairway Drive
Deerfield Beach, Florida 33441

Telephone:
Deerfield Beach (305) 481-2800

RECEIVED
APR 26 1995
Bureau of
Air Regulation

CERTIFIED MAIL - RRR
Z 115 124 470

24 April 1995

Mr. C.H. Fancy, P.E.
Chief – Bureau of Air Regulation
Fla. Dept. Of Environmental Protection
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

RE: **Pennsuco Cement Plant**
Dade County - AP
Kiln No. 2 Coal Conversion
FDEP Permit No. AC13-169901 [PSD-FL-142]

Dear Mr. Fancy:

A review of the above facility permit file revealed that Tarmac's request for permit extension was not acted upon by the Department. Your letter of October 19, 1993 (copy enclosed) stated "**. . . the existing permit shall remain in effect until the renewal application has been finally acted upon by the Department.** ". By the same letter requested Tarmac to provide evidence to show that construction had commenced prior to April 1, 1994. Tarmac submitted to the Department on March 28, 1994 (copy enclosed) a *Certificate of Completion of Construction* along with notice that testing as specified in the referenced permit was to commence. That information should have satisfied the Department's request.

Tarmac would ask that the Department review the enclosed documents and grant a permit extension until August 31, 1995. By the testing specified by the permit conditions will be completed within the next 30 days and an operation permit application should be ready for submittal within 60 days thereafter. Should you have any questions or need further information please call me at (800)330-3380 x4165.

Sincerely,

Scott Quaas
Environmental Manager
Technical Services

cc: R. Pluta
A. Townsend
B. Smith
D. Bailey
S. Brooks – FDEP, WPB
DERM

Florida Department of
Environmental Protection

Lawton Chiles
Governor

Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Virginia B. Wetherell
Secretary

RECEIVED
OCT 25 1993
TECHNICAL SERVICES

October 19, 1993

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Mr. Albert W. Townsend
Director of Technical Services
Tarmac Florida, Inc.
455 Fairway Drive
Deerfield Beach, Florida 33441

Dear Mr. Townsend:

RE: Extension of Permit No. PSD-FL-142/Kiln No. 2

This is in reply to your October 1, 1993, letter requesting another eighteen-month extension of the referenced permit. This would amount to a three-year extension of the original permit expiration date. Such a lengthy extension brings into question whether or not the BACT determination and emission limits are still representative of "best available control technology" required for PSD permits. Although the extensions may have been needed for reasons beyond Tarmac's control, the Department is reluctant to continue granting extensions without revisiting the BACT determination.

Since a timely request for permit renewal has been made in accordance with Florida Administrative Code, Rule 17-4.090, the existing permit shall remain in effect until the renewal application has been finally acted upon by the Department. On or before March 31, 1994, Tarmac must present evidence to the Department sufficient to show that construction has commenced as described in the permit, at which time the second extension will be granted. If construction has not begun prior to April 1, 1994, the Department will decide whether or not to revise and extend the permit at that time. If there are questions regarding any of the above, please contact Preston Lewis or John Reynolds of our staff at 904-488-1344.

Sincerely,

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

c: I. Goldman, SED
J. Harper, EPA
E. Anderson, DCDERM
D. Buff, P.E.

TARMAC

TARMAC FLORIDA, INC.

455 Fairway Drive
Deerfield Beach, Florida 33441

Telephone:
Deerfield Beach (305) 481-2800

CERTIFIED MAIL - RRR
P 388 117 566

28 March 1994

Ms. Stephanie Brooks
Supervisor - Air Resource Management
Fla. Dept. of Environmental Regulation
P.O. Box 15425
W. Palm Beach, Florida 33416

RE: **Pennsuco Cement Plant**
Dade County - AP
Kiln No. 2 Coal Conversion
FDEP Permit No. AC13-169901 [PSD-FL-142]

Dear Ms. Brooks:

Please find enclosed a *Certificate of Completion of Construction* for the above referenced air pollution project. The *Certificate* is being submitted to present evidence that construction under the referenced permit has been completed and testing specified in the permit will commence to establish emission limitations. Stack emission testing has been scheduled for April 26 through April 29 for the parameters listed in the permit. Method 2~~6~~5A will be used for VOC emissions instead of Method 2~~6~~5. A copy of the *Certificate* along with this letter has been forwarded to the DERM as proper notice of testing. Should you have any questions or need further information please call me at (800)330-3380 x4165.

Sincerely,

Scott Quaas
Environmental Manager
Technical Services

cc: A. Townsend
C. Fancy - FDEP, Tallahassee
E. Anderson - DERM

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION

AIR POLLUTION SOURCES
CERTIFICATE OF COMPLETION OF CONSTRUCTION*

PERMIT NO. AC13-169901 [PSD-FL-142] DATE 28 March 1994

Company Name: TARMAC FLORIDA, INC. County: Dade

Source Identification(s): Kiln No. 2 coal conversion

Actual costs of serving pollution control purpose: $ NA

Operating Rates: 197,000 T/yr clinker - 162.5 MMBtu/hr Design Capacity: 197,000 T/yr clinker - 162.5 MMBtu/hr

Expected Normal ______ During Compliance Test ______

Date of Compliance Test: test scheduled 4/26/94 - 4/29/94 (Attach detailed test report)

Test Results: Pollutant	Actual Discharge	Allowed Discharge

Date plant placed in operation: 28 March 1994

This is to certify that, with the exception of deviations noted**, the construction of the project has been completed in accordance with the application to construct and Construction Permit No. AC13-169901 dated 30 June 1992.

A. Applicant:

Scott Quaas - Environmental Manager
Name of Person Signing (Type)

Signature of Owner or Authorized Representative and Title

Date: 2 8 MAR 1994 Telephone: (305)481-2800

B. Professional Engineer:

John D. Light
Name of Person Signing (Type)

John D. Light
Signature of Professional Engineer

TARMAC FLORIDA, INC.
Company Name

Florida Registration No. 43336

Date: 3-28-94

(Seal)

455 Fairway Drive, Deerfield Beach, FL 33441
Mailing Address

(305)481-2800
Telephone Number

*This form, satisfactorily completed, submitted in conjunction with an existing application to construct permit and payment of application processing fee will be accepted in lieu of an application to operate.

**As built, if not built as indicated include process flow sketch, plot plan sketch, and updates of applicable pages of application form.

Bruce

Tarmac

TARMAC FLORIDA, INC.

455 Fairway Drive
Deerfield Beach, Florida 33441

Telephone:
Deerfield Beach (305) 481-2800

CERTIFIED MAIL - RRR
P 388 117 592

RECEIVED
JUN 17 1994
Bureau of
Air Regulation

14 June 1994

Ms. Stephanie Brooks
Supervisor – Air Resource Management
Fla. Dept. of Environmental Protection
P.O. Box 15425
W. Palm Beach, Florida 33416

RE: **Pennsuco Cement Plant**
Dade County - AP
Kiln No. 2 Coal Conversion
FDEP Permit No. AC13-169901

Dear Ms. Brooks:

Please find enclosed stack a emission test report in accordance with the test protocol specified in the above referenced permit. The protocol requires a series of compliance tests every two months for one year and the enclosed test is the first in that series. The next compliance test is scheduled for June 28-29, 1994. The table below summarizes the test results and will be up-dated after each of the compliance tests.

Test Date	Clinker Production	Sulfur Dioxide	Sulfuric Acid Mist	Nitrogen Oxides	Carbon Monoxide	VOC's	Particulate Matter	PM10
4/26-27/94	24.08	0.36	0.07	417.32	9.73	1.00	13.26	11.27

all test results in lbs/hr

I have also enclosed the annual stack emission test results for the Cooler No. 2 which was conducted concurrent with the above tests. The results indicate compliance with applicable particulate emission standards. Copies of this letter and the enclosed test reports have been forwarded to the DERM and will serve as proper notice of the next scheduled test. Should you have any questions regarding the enclosed reports please call me at (800)330-3380 x4165.

Sincerely,

Scott Quaas
Environmental Manager
Technical Services

cc: A. Townsend
R. Pluta
E. Anderson - DERM
C. Fancy - FDEP, Tallahassee

Tarmac

TARMAC FLORIDA, INC.

455 Fairway Drive
Deerfield Beach, Florida 33441

Telephone:
Deerfield Beach (305) 481-2800

RECEIVED

APR 01 1994

Bureau of
Air Regulation

CERTIFIED MAIL - RRR
P 388 117 566

28 March 1994

Ms. Stephanie Brooks
Supervisor – Air Resource Management
Fla. Dept. of Environmental Regulation
P.O. Box 15425
W. Palm Beach, Florida 33416

RE: **Pennsuco Cement Plant**
Dade County - AP
Kiln No. 2 Coal Conversion
FDEP Permit No. AC13-169901 [PSD-FL-142]

Dear Ms. Brooks:

Please find enclosed a *Certificate of Completion of Construction* for the above referenced air pollution project. The *Certificate* is being submitted to present evidence that construction under the referenced permit has been completed and testing specified in the permit will commence to establish emission limitations. Stack emission testing has been scheduled for April 26 through April 29 for the parameters listed in the permit. Method 26A will be used for VOC emissions instead of Method 26. A copy of the *Certificate* along with this letter has been forwarded to the DERM as proper notice of testing. Should you have any questions or need further information please call me at (800)330-3380 x4165.

Sincerely,

Scott Quaas
Environmental Manager
Technical Services

cc: A. Townsend
C. Fancy - FDEP, Tallahassee
E. Anderson - DERM

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION

AIR POLLUTION SOURCES
CERTIFICATE OF COMPLETION OF CONSTRUCTION*

PERMIT NO. AC13-169901 [PSD-FL-142] DATE: 28 March 1994

Company Name: TARMAC FLORIDA, INC. County: Dade

Source Identification(s): Kiln No. 2 coal conversion

Actual costs of serving pollution control purpose: $ NA

Operating Rates: 197,000 T/yr clinker - 162.5 MMBtu/hr Design Capacity: 197,000 T/yr clinker - 162.5 MMBtu/hr

Expected Normal ______ During Compliance Test ______

Date of Compliance Test: test scheduled 4/26/94 - 4/29/94 (Attach detailed test report)

Test Results:

Pollutant	Actual Discharge	Allowed Discharge

Date plant placed in operation: 28 March 1994

This is to certify that, with the exception of deviations noted**, the construction of the project has been completed in accordance with the application to construct and Construction Permit No. AC13-169901 dated 30 June 1992.

A. Applicant:

Scott Quaas - Environmental Manager
Name of Person Signing (Type)

Signature of Owner or Authorized Representative and Title

Date: 28 MAR 1994 Telephone: (305)481-2800

B. Professional Engineer:

John D. Light
Name of Person Signing (Type)

John D. Light
Signature of Professional Engineer

TARMAC FLORIDA, INC
Company Name

Florida Registration No. 43339

Date: 3-28-94

(Seal)

455 Fairway Drive, Deerfield Beach, FL 33441
Mailing Address

(305)481-2800
Telephone Number

*This form, satisfactorily completed, submitted in conjunction with an existing application to construct permit and payment of application processing fee will be accepted in lieu of an application to operate.

**As built, if not built as indicated include process flow sketch, plot plan sketch, and updates of applicable pages of application form.

Florida Department of
Environmental Protection

Lawton Chiles
Governor

Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Virginia B. Wetherell
Secretary

October 19, 1993

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Mr. Albert W. Townsend
Director of Technical Services
Tarmac Florida, Inc.
455 Fairway Drive
Deerfield Beach, Florida 33441

Dear Mr. Townsend:

RE: Extension of Permit No. PSD-FL-142/Kiln No. 2

This is in reply to your October 1, 1993, letter requesting another eighteen-month extension of the referenced permit. This would amount to a three-year extension of the original permit expiration date. Such a lengthy extension brings into question whether or not the BACT determination and emission limits are still representative of "best available control technology" required for PSD permits. Although the extensions may have been needed for reasons beyond Tarmac's control, the Department is reluctant to continue granting extensions without revisiting the BACT determination.

Since a timely request for permit renewal has been made in accordance with Florida Administrative Code, Rule 17-4.090, the existing permit shall remain in effect until the renewal application has been finally acted upon by the Department. On or before March 31, 1994, Tarmac must present evidence to the Department sufficient to show that construction has commenced as described in the permit, at which time the second extension will be granted. If construction has not begun prior to April 1, 1994, the Department will decide whether or not to revise and extend the permit at that time. If there are questions regarding any of the above, please contact Preston Lewis or John Reynolds of our staff at 904-488-1344.

Sincerely,

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

c: I. Goldman, SED
J. Harper, EPA
E. Anderson, DCDERM
D. Buff, P.E.

Is your RETURN ADDRESS completed on the reverse side?

SENDER:
- Complete items 1 and/or 2 for additional services.
- Complete items 3, and 4a & b.
- Print your name and address on the reverse of this form so that we can return this card to you.
- Attach this form to the front of the mailpiece, or on the back if space does not permit.
- Write "Return Receipt Requested" on the mailpiece below the article number.
- The Return Receipt will show to whom the article was delivered and the date delivered.

I also wish to receive the following services (for an extra fee):
1. ☐ Addressee's Address
2. ☐ Restricted Delivery

Consult postmaster for fee.

3. Article Addressed to:

Mr. Albert W. Townsend
Director of Technical Services
Tarmac Florida, Inc.
455 Fairway Drive
Deerfield Beach, Florida 33441

4a. Article Number
P 872 562 482

4b. Service Type
☐ Registered ☐ Insured
☒ Certified ☐ COD
☐ Express Mail ☐ Return Receipt for Merchandise

7. Date of Delivery
10/25/93

5. Signature (Addressee)

8. Addressee's Address (Only if requested and fee is paid)

6. Signature (Agent) Mel Rankin

PS Form **3811**, December 1991 ☆U.S. GPO: 1992—323-402 **DOMESTIC RETURN RECEIPT**

Thank you for using Return Receipt Service.

P 872 562 482

Receipt for Certified Mail

UNITED STATES POSTAL SERVICE

No Insurance Coverage Provided
Do not use for International Mail
(See Reverse)

Sent to	Mr. Albert W. Townsend
Street and No.	455 Fairway Drive
P.O., State and ZIP Code	Deerfield Beach, FL 33441
Postage	$
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt Showing to Whom & Date Delivered	
Return Receipt Showing to Whom, Date, and Addressee's Address	
TOTAL Postage & Fees	$
Postmark or Date	Mailed: 10/20/93 ~~AC05-238122~~ PSD-FL-142 ~~Brevard County~~ Kiln No-3 Tarmac, FL

PS Form **3800**, JUNE 1991

Tarmac

0000733

TARMAC FLORIDA, INC.

455 Fairway Drive
Hillsboro Executive Center North
Deerfield Beach, Florida 33441

Telephone:
Deerfield Beach (305) 481-2800

1993 OCT -8 PM 1:12
RECEIVED
DER - MAIL ROOM

October 1, 1993

Certified Mail: P 411 882 319

Mr. C. H. Fancy, P.E.
Florida Department of Environmental Protection
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399

RE: Tarmac Kiln #2 Coal Conversion Permit - #AC13-169901 expiring 12/31/93.

Dear Mr. Fancy:

This letter is to update you on the status of our coal conversion of Kiln #2 and to request an extension of same. In our last correspondence we were starting up the Kiln on gas and operating on it until it became uneconomical to continue; at that time we were going to convert to coal. We have operated for almost eighteen months on gas and our last contract renewal (which expires 3/31/94) was at a price that made the investment of capital to install the coal system feasible. Our contract is a take or pay contract and we are obligated until 3/31/94. At that time, the conversion will be made.

Our current conversion permit expires 12/31/93. Therefore, we respectfully request pursuant to FAC 17-4.080 (3) our construction/testing permit be extended until 6/31/95. This will give us adequate time to install, test, and analyze the results so that the appropriate emission standards can be set. This methodology is required by our permit. We have enclosed a check in the amount of $50.00 as required. All other conditions shall remain the same.

If you have any questions please contact me at 1-800-330-3380 ext.# 4161.

Sincerely,

Albert W. Townsend
Director of Technical Services

062222

cc. D. Bailey, C. James, A. Hopkins, D. Buff
G. Reynolds

Tarmac

0000733

TARMAC FLORIDA, INC.

455 Fairway Drive
Hillsboro Executive Center North
Deerfield Beach, Florida 33441

Telephone:
Deerfield Beach (305) 481-2800

RECEIVED
DER - MAIL ROOM
1993 OCT -8 PM 1:12

October 1, 1993

Certified Mail: P 411 882 319

Mr. C. H. Fancy, P.E.
Florida Department of Environmental Protection
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399

RE: Tarmac Kiln #2 Coal Conversion Permit - #AC13-169901 expiring 12/31/93.

Dear Mr. Fancy:

This letter is to update you on the status of our coal conversion of Kiln #2 and to request an extension of same. In our last correspondence we were starting up the Kiln on gas and operating on it until it became uneconomical to continue; at that time we were going to convert to coal. We have operated for almost eighteen months on gas and our last contract renewal (which expires 3/31/94) was at a price that made the investment of capital to install the coal system feasible. Our contract is a take or pay contract and we are obligated until 3/31/94. At that time, the conversion will be made.

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TARMAC FLORIDA, INC.
P.O. BOX 8648, DEERFIELD BEACH, 33443

NATIONSBANK OF TEXAS, N.A.
WICHITA FALLS, TEXAS 76301

CHECK NUMBER 00117999 117999

88-
11

0000733 16059

DATE	AMOUNT
10/01/93	$*********50.00

PAY
IFTY AND 00/100 **
TO THE ORDER OF:

FLORIDA DEPARTMENT OF
ENVIRONMENTAL PROTECTION,

AUTHORIZED SIGNATURES

[redacted]

Florida Department of Environmental Regulation

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

Lawton Chiles, Governor

Carol M. Browner, Secretary

April 20, 1992

CERTIFIED MAIL - RETURN RECEIPT REQUESTED

Mr. Albert W. Townsend
Director, Technical Services
Tarmac Florida, Inc.
455 Fairway Drive
Deerfield Beach, FL 33441

Dear Mr. Townsend:

Re: Extension of Permit No. PSD-FL-142/Kiln No. 2

The Department received your March 24 letter requesting an extension of the expiration date of the above permit. The expiration date is changed as shown below:

FROM: June 30, 1992

TO: December 31, 1993

Another $50.00 fee will be required if it is necessary to request another extension. This letter shall become Attachment No. 14 to this permit.

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 their 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 intent. 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 receipt of this intent 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.

Sincerely,

Steve Smallwood

STEVE SMALLWOOD, P.E.
Director
Division of Air Resources
Management

SS/JR/plm

c: I. Goldman, SED
D. Buff, P.E.
J. Harper, EPA
E. Anderson, DCDERM

SENDER:
- Complete items 1 and/or 2 for additional services.
- Complete items 3, and 4a & b.
- Print your name and address on the reverse of this form so that we can return this card to you.
- Attach this form to the front of the mailpiece, or on the back if space does not permit.
- Write "Return Receipt Requested" on the mailpiece below the article number.
- The Return Receipt Fee will provide you the signature of the person delivered to and the date of delivery.

I also wish to receive the following services (for an extra fee):
1. ☐ Addressee's Address
2. ☐ Restricted Delivery

Consult postmaster for fee.

3. Article Addressed to:
Albert W. Townsend
Jarnac Florida Inc
455 Fairway Dr.
Deerfield Bch, Fl
33441

4a. Article Number
P 710 058 457

4b. Service Type
☐ Registered ☐ Insured
☒ Certified ☐ COD
☐ Express Mail ☐ Return Receipt for Merchandise

7. Date of Delivery
4-27-92

5. Signature (Addressee)

8. Addressee's Address (Only if requested and fee is paid)

6. Signature (Agent)

PS Form 3811, November 1990 ☆U.S. GPO: 1991—287-066 **DOMESTIC RETURN RECEIPT**

P 710 058 457

Certified Mail Receipt
No Insurance Coverage Provided
Do not use for International Mail
(See Reverse)

UNITED STATES POSTAL SERVICE

Sent to Albert Townsend	
Street & No. Jarnac Fl Inc	
P.O., State & ZIP Code Deerfield Bch, Fl	
Postage	$
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt Showing to Whom & Date Delivered	
Return Receipt Showing to Whom, Date, & Address of Delivery	
TOTAL Postage & Fees	$
Postmark or Date	

PS Form **3800**, June 1990

State of Florida
DEPARTMENT OF ENVIRONMENTAL REGULATION

For Routing To Other Than The Addressee	
To:	Location:
To:	Location:
To:	Location:
From:	Date:

Interoffice Memorandum

TO: Steve Smallwood

FROM: Clair Fancy CHF

DATE: April 20, 1992

SUBJ: Extension of Permit No. PSD-FL-142/Kiln No. 2
Tarmac Florida, Inc.

Attached for your approval and signature is a letter extending the expiration date for the above referenced construction permit.

The Bureau recommends approval of this amendment.

CF/JR/plm

Attachment

OK [signature] 4-20-92

Tarmac

DER RECEIVED MAIL ROOM
1992 MAR 30 AM 11: 12

TARMAC FLORIDA, INC.

455 Fairway Drive
Hillsboro Executive Center North
Deerfield Beach, Florida 33441

Telephone:
Deerfield Beach (305) 481-2800

March 24, 1992

Mr. C.H. Fancy, P.E.
Florida Department of Environmental Regulation
Twin Towers Office Bldg.
2600 Blair Stone Road
Tallahassee, Florida 32399

RE: Tarmac Pennsuco Cement Plant Coal Conversion Kiln # 2

Dear Mr. Fancy:

This letter is to update you on the status of Kiln #2's coal conversion and to request an extension of same. At the time of permitting it was anticipated that the cement demand would increase sufficiently to allow Kiln #2 to be started up. Unfortunately, this did not materialize in 1991. The market has just recently indicated an upturn sufficient to consume this added production. Also, the Venzueala cement dumping suit has been settled in favor of American producers and a tariff has been placed on these imports. Coincidentally, natural gas availability and prices have become more favorable.

This being the case, and to keep our investment at a minimum we are opting to start Kiln #2 up on gas the last week of March. We do believe, however that the availability and/or the pricing of the gas will be short lived and expect to convert to coal within the next twelve months.

We respectfully request persuant to FAC 17-4.080(3) our construction/testing permit #AC13-169901 be extended until 12/31/93. A $50.00 check is enclosed for the extension persuant to F.A.C. 17-4.050(4)(0)3. We will timely notify the department as when our compliance testing will be performed on Kiln #2 persuant to the existing operation permit.

If you have any additional questions you can contact me at (305) 425-4161.

Sincerely,

Albert W. Townsend

Albert W. Townsend
Director Technical Services

901631

cc: E. Anderson, DCDERM
D. Buff, KBN Engineering
B. Smith
D. Bailey
M. Kane
S. Brooks, SE Dist.
J. Reynolds

THIS CHECK IS DELIVERED FOR PAYMENT ON THE FOLLOWING ACCOUNTS

DATE	AMOUNT
3/19/92	50 00
K-2 COAL CONVERSION	
PERMIT 6/30/92 THRU	
12/31/93	
TOTAL OF INVOICE	50 00
LESS __ % DISCOUNT	
LESS FREIGHT	
LESS	
TOTAL DEDUCTIONS	
AMOUNT OF CHECK	50 00

BEST AVAILABLE COPY

41084

TARMAC FLORIDA, INC.
PENNSUCO
P. O. BOX 8648
DEERFIELD BEACH, FL 33443

63-27/631 36

3/19 1992

PAY TO THE ORDER OF Florida Dept. of Environmental Regulation $50.00

Fifty and 00/100 DOLLARS

NCNB National Bank of Florida
Tampa, Florida

NOT VALID FOR AMOUNTS GREATER THAN $5,000.00

David Bailey

[redacted]

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

RE: Tarmac Pennsuco Cement Plant Coal Conversion Kiln # 2

Dear Mr. Fancy:

This letter is to update you on the status of Kiln #2's coal conversion and to request an extension of same. At the time of permitting it was anticipated that the cement demand would increase sufficiently to allow Kiln #2 to be started up. Unfortunately, this did not materialize in 1991. The market has just recently indicated an upturn sufficient to consume this added production. Also, the Venzueala cement dumping suit has been settled in favor of American producers and a tariff has been placed on these imports. Coincidentally, natural gas availability and prices have become more favorable.

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Sincerely,

Albert W. Townsend

901031

Albert W. Townsend
Director Technical Services

cc: E. Anderson, DCDERM
D. Buff, KBN Engineering
B. Smith
D. Bailey
M. Kane

Polaris - Burner Mfr.

Florida Department of Environmental Regulation

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

Lawton Chiles, Governor

Carol M. Browner, Secretary

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION
NOTICE OF PERMIT

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

February 26, 1991

Enclosed is construction permit No. AC 13-169901, PSD-FL-142, to convert kiln No. 2 to coal firing at Tarmac, Inc. in Medley, Dade County, Florida. This permit is issued pursuant to Section 403, Florida Statutes.

Any party to this permit has the right to seek judicial review of the permit pursuant to Section 120.68, Florida Statutes, by the filing of a Notice of Appeal pursuant to Rule 9.110, Florida Rules of Appellate Procedure, with the Clerk of the Department in the Office of General Counsel, 2600 Blair Stone Road, Tallahassee, Florida 32399-2400; and by filing a copy of the Notice of Appeal accompanied by the applicable filing fees with the appropriate District Court of Appeal. The Notice of Appeal must be filed within 30 days from the date this permit is filed with the Clerk of the Department.

Executed in Tallahassee, Florida.

STATE OF FLORIDA DEPARTMENT
OF ENVIRONMENTAL REGULATION

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

Copy 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 PERMIT and all copies were mailed before the close of buisness on 2-27-91.

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 Tober 2-27-91

Clerk Date

FINAL DETERMINATION

The Technical Evaluation and Preliminary Determination for the permit to convert kiln No. 2 to coal firing at Tarmac, Inc. in Medley, Dade County, Florida, was distributed on March 29, 1990. The Notice of Intent to Issue was published in The Miami Herald on August 7, 1990. Copies of the evaluation were available for public inspection at the Department's Tallahassee and West Palm Beach offices.

Comments from the U.S. Environmental Protection Agency (EPA), the National Park Service (NPS), and the Dade County Department of Environmental Resources Management (DCDERM) were submitted on the Department's Intent to Issue the permit.

The EPA commented that the permit must include an emission limit and test method for CO and PM_{10}, and specific measures for controlling fugitive emissions from the storage of coal. These changes are included in the final permit.

The NPS took exception to the applicant's proposal of setting final emission limits after performance testing has been completed, arguing that this approach is inconsistent with today's "top down" BACT policy. Considering that the EPA did not take exception to this, the Department decided to agree to consider upward adjustments of the emission limits if warranted based on extensive testing to be carried out by the applicant over a period of one year. The NPS also pointed out that the applicant's air quality analysis may not have included increment consuming sources located outside of Dade County which may impact the Everglades National Park. The Department again reviewed the application and verified that the emissions inventory used in the modeling analysis did include sources located in Broward as well as Dade County. The NPS also expressed concern about the potential of the applicant's proposed source to contribute to the regional haze problem, citing published reports that such large sources can cause marked reductions in visibility, primarily as a result of sulfates and organics. The Department believes that the emission limits in the final permit will not result in future reduced visibility for the Everglades National Park, and especially since the allowable Class I SO_2 increment is virtually consumed by this source thus precluding further impact.

The DCDERM stated that the applicant has not adequately demonstrated that Kilns 2 and 3 are substantially different justifying higher emission limits for Kiln 2. They feel that data for Kiln 3 can be used as a basis for the BACT determination for Kiln 2. The Department believes that the final permit conditions satisfy the concerns expressed by the DCDERM.

On June 19, 1990, a petition was filed by Tarmac for an administrative hearing to review the BACT Determination and proposed emission limits. The issues contested in the petition were later resolved between the parties without the hearing. A final order containing modified permit conditions was filed on December 7, 1990. The final action of the Department will be to issue construction permit AC 13-169901, PSD-FL-142 as modified by the final order and incorporating the changes required by EPA.

STATE OF FLORIDA DEPARTMENT OF ENVIRONMENTAL REGULATION

Florida Department of Environmental Regulation

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

Lawton Chiles, Governor

Carol M. Browner, Secretary

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

Permit Number: AC 13-169901
PSD-FL-142
Expiration Date: June 30, 1992
County: Dade
Latitude/Longitude: 25°52'30"N
80°22'30"W
Project: Kiln No. 2 Coal Conversion

This permit is issued under the provisions of Chapter 403, Florida Statutes, and Florida Administrative Code Chapters 17-2 and 17-4. The above named permittee is hereby authorized to perform the work or operate the facility shown on the application and approved drawing(s), plans, and other documents attached hereto or on file with the Department and made a part hereof and specifically described as follows:

For the conversion of kiln No. 2 to coal firing. The project will be located at the permittee's existing facility in Medley, Dade County, Florida. The UTM coordinates are Zone 17, 562.8 km East and 2861.7 km North.

The source shall be constructed in accordance with the permit application, plans, documents, amendments and drawings, except as otherwise noted in the General and Specific Conditions.

Attachments are listed below:

1. Application to construct received September 5, 1989.
2. DER's letter of incompleteness dated October 4, 1989.
3. EPA's letter dated October 18, 1989.
4. KBN's response (to incompleteness letter) dated November 13, 1989.
5. Dade County DERM's letter dated November 17, 1989.
6. EPA's letter dated December 13, 1989.
7. KBN's letter dated December 21, 1989.
8. KBN's letter dated January 15, 1990.
9. KBN's letter dated January 30, 1990.
10. EPA's letter dated March 20, 1990.
11. EPA's letter dated April 13, 1990.
12. Dade County DERM's letter dated April 30, 1990.
13. NPS's letter dated May 30, 1990.

PERMITTEE:
Tarmac Florida, Inc.

Permit Number: AC 13-169901
PSD-FL-142
Expiration Date: June 30, 1992

GENERAL CONDITIONS:

1. The terms, conditions, requirements, limitations, and restrictions set forth in this permit are "Permit Conditions" and are binding and enforceable pursuant to Sections 403.161, 403.727, or 403.859 through 403.861, Florida Statutes. The permittee is placed on notice that the Department will review this permit periodically and may initiate enforcement action for any violation of these conditions.

2. This permit is valid only for the specific processes and operations applied for and indicated in the approved drawings or exhibits. Any unauthorized deviation from the approved drawings, exhibits, specifications, or conditions of this permit may constitute grounds for revocation and enforcement action by the Department.

3. As provided in Subsections 403.087(6) and 403.722(5), Florida Statutes, the issuance of this permit does not convey any vested rights or any exclusive privileges. Neither does it authorize any injury to public or private property or any invasion of personal rights, nor any infringement of federal, state or local laws or regulations. This permit is not a waiver of or approval of any other Department permit that may be required for other aspects of the total project which are not addressed in the permit.

4. This permit conveys no title to land or water, does not constitute State recognition or acknowledgement of title, and does not constitute authority for the use of submerged lands unless herein provided and the necessary title or leasehold interests have been obtained from the State. Only the Trustees of the Internal Improvement Trust Fund may express State opinion as to title.

5. This permit does not relieve the permittee from liability for harm or injury to human health or welfare, animal, or plant life, or property caused by the construction or operation of this permitted source, or from penalties therefore; nor does it allow the permittee to cause pollution in contravention of Florida Statutes and Department rules, unless specifically authorized by an order from the Department.

GENERAL CONDITIONS:

6. The permittee shall properly operate and maintain the facility and systems of treatment and control (and related appurtenances) that are installed or used by the permittee to achieve compliance with the conditions of this permit, as required by Department rules. This provision includes the operation of backup or auxiliary facilities or similar systems when necessary to achieve compliance with the conditions of the permit and when required by Department rules.

7. The permittee, by accepting this permit, specifically agrees to allow authorized Department personnel, upon presentation of credentials or other documents as may be required by law and at a reasonable time, access to the premises, where the permitted activity is located or conducted to:

a. Have access to and copy any records that must be kept under the conditions of the permit;

b. Inspect the facility, equipment, practices, or operations regulated or required under this permit; and

c. Sample or monitor any substances or parameters at any location reasonably necessary to assure compliance with this permit or Department rules.

Reasonable time may depend on the nature of the concern being investigated.

8. If, for any reason, the permittee does not comply with or will be unable to comply with any condition or limitation specified in this permit, the permittee shall immediately provide the Department with the following information:

a. a description of and cause of non-compliance; and

b. the period of noncompliance, including dates and times; or, if not corrected, the anticipated time the non-compliance is expected to continue, and steps being taken to reduce, eliminate, and prevent recurrence of the non-compliance.

GENERAL CONDITIONS:

The permittee shall be responsible for any and all damages which may result and may be subject to enforcement action by the Department for penalties or for revocation of this permit.

9. In accepting this permit, the permittee understands and agrees that all records, notes, monitoring data and other information relating to the construction or operation of this permitted source which are submitted to the Department may be used by the Department as evidence in any enforcement case involving the permitted source arising under the Florida Statutes or Department rules, except where such use is prescribed by Sections 403.73 and 403.111, Florida Statutes. Such evidence shall only be used to the extent it is consistent with the Florida Rules of Civil Procedure and appropriate evidentiary rules.

10. The permittee agrees to comply with changes in Department rules and Florida Statutes after a reasonable time for compliance, provided, however, the permittee does not waive any other rights granted by Florida Statutes or Department rules.

11. This permit is transferable only upon Department approval in accordance with Florida Administrative Code Rules 17-4.120 and 17-30.300, F.A.C., as applicable. The permittee shall be liable for any non-compliance of the permitted activity until the transfer is approved by the Department.

12. This permit or a copy thereof shall be kept at the work site of the permitted activity.

13. This permit also constitutes a Determination of Best Available Control Technology (BACT) and Determination of Prevention of Significant Deterioration (PSD).

14. The permittee shall comply with the following:

a. Upon request, the permittee shall furnish all records and plans required under Department rules. During enforcement actions, the retention period for all records will be extended automatically unless otherwise stipulated by the Department.

GENERAL CONDITIONS:

b. The permittee shall hold at the facility or other location designated by this permit records of all monitoring information (including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation) required by the permit, copies of all reports required by this permit, and records of all data used to complete the application for this permit. These materials shall be retained at least three years from the date of the sample, measurement, report, or application unless otherwise specified by Department rule.

c. Records of monitoring information shall include:

- the date, exact place, and time of sampling or measurements;
- the person responsible for performing the sampling or measurements;
- the dates analyses were performed;
- the person responsible for performing the analyses;
- the analytical techniques or methods used; and
- the results of such analyses.

15. When requested by the Department, the permittee shall within a reasonable time furnish any information required by law which is needed to determine compliance with the permit. If the permittee becomes aware that relevant facts were not submitted or were incorrect in the permit application or in any report to the Department, such facts or information shall be corrected promptly.

SPECIFIC CONDITIONS:

1. The construction and operation of the subject modification of kiln No. 2 shall be in accordance with the capacities and specifications stated in the application.

2. The maximum clinker production rate of kiln No. 2 shall not exceed 25 tons per hour and 197,100 tons per year. Kiln No. 2 shall operate only on coal firing for up to 7,884 hours per year at a maximum firing rate of 162.5 MMBtu per hour. The coal used for firing kiln No. 2 shall have a maximum sulfur content of 2.0 percent by weight, with the rolling 30-day average sulfur content not exceeding 1.75 percent by weight.

3. Sulfur dioxide emissions from kiln No. 2 shall not exceed 7.8 lbs/ton of clinker produced, 195.0 lbs/hr, 768.7 tons/yr.

PERMITTEE:
Tarmac Florida, Inc.

Permit Number: AC 13-169901
PSD-FL-142
Expiration Date: June 30, 1992

0.23 lb/ton x 25 ton/hr x hr/162.5 mmBTU = 0.35 lb/mmBTU

SPECIFIC CONDITIONS:

4. Sulfuric acid mist emissions from kiln No. 2 shall not exceed 0.23 lb/ton of clinker produced, 5.86 lbs/hr, 23.06 tons/yr.

5. Nitrogen oxides emissions from kiln No. 2 shall not exceed 4.55 lbs/ton of clinker produced, 113.8 lbs/hr, 448.4 tons/yr.

0.7 lb/mmBTU

6. Carbon monoxide emissions from kiln No. 2 shall not exceed 346 lbs/hr, 1363.9 tons/yr.

7. VOC emissions from kiln No. 2 shall not exceed 28.8 lbs/hr, 113.5 tons/yr.

8. Particulate matter emissions from kiln No. 2 shall not exceed 14.40 lbs/hr, 56.76 tons/yr.

9. PM_{10} emissions from kiln No. 2 shall not exceed 12.24 lbs/hr, 48.25 tons/yr. Compliance for PM_{10} shall be determined by applying a factor of 0.85 to the measured particulate matter emissions.

10. All reasonable precautions that apply under F.A.C. Rule 17-2.610(3) shall be implemented to limit unconfined emissions of particulate matter from any activity associated with this project. Adequate watering of the coal pile area shall be conducted whenever visible emissions occur in that area. The frequency of watering shall be no more than every half hour.

11. Initial and annual compliance tests shall be conducted using the following test methods:

EPA Method 5 for particulate matter
EPA Method 7 for nitrogen oxides
EPA Method 8 for sulfur dioxide and acid mist
EPA Method 25 for VOC
EPA Method 10 for carbon monoxide

12. Tarmac shall conduct a series of compliance tests for SO_2, H_2SO_4 mist, and NO_x emissions every two months for up to one year to allow representative sampling during different times of the year. The tests shall be performed in accordance with the compliance test methods specified in this permit. In the event that this series of tests results in SO_2 emissions in the range of 195 to 275 lbs/hr (up to 11 lbs/ton clinker, 1,084.1 TPY), NO_x emissions in the range of 113.8 to 169.3 lbs/hr (up to 6.77 lbs/ton clinker, 667.2 TPY), or H_2SO_4 mist emissions in the range

SPECIFIC CONDITIONS:

of 5.86 to 8.25 lbs/hr (up to 0.33 lbs/ton clinker, 32.52 TPY), the Department, if requested by the permittee, shall re-evaluate BACT and consider upward adjustments of the emission limitations for the indicated constituents based on available data. During this testing and evaluation period, the permittee shall make reasonable efforts to limit air emissions, and the Department shall not initiate enforcement proceedings. Any upward adjustment of emission limitations pursuant to this paragraph shall be the subject of public notice in a local newspaper pursuant to Department rules. The Department's determination based on the data produced under this paragraph shall be a point of entry for purposes of Section 120.57, Florida Statutes.

13. The compliance tests shall be conducted within 30 days after operation on coal begins. The Department's Southeast District office and the Dade County Department of Environmental Resources Management (DCDERM) shall be notified in writing at least 15 days prior to source testing and at least 5 days prior to initial startup. Written reports of the tests shall be submitted to those offices within 45 days of test completion.

14. The permittee, for good cause, may request that this construction permit be extended. Such a request shall be submitted to the Bureau of Air Regulation prior to 60 days before the expiration of the permit (F.A.C. Rule 17-4.090).

15. An application for an operation permit must be submitted to the Department's Southeast District office and the DCDERM at least 90 days prior to the expiration date of this construction permit or within 45 days after completion of compliance testing, whichever occurs first. To properly apply for an operation permit, the applicant shall submit the appropriate application form, fee, certification that construction was completed noting any deviations from the conditions in the construction permit, and compliance test reports as required by this permit (F.A.C. Rule 17-4.220).

Issued this 25 day
of February, 1991

STATE OF FLORIDA DEPARTMENT
OF ENVIRONMENTAL REGULATION

Carol M. Browner

Carol M. Browner, Secretary

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 6.77?

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 previous BACT determinations, though it is on the stringent side.

Also, least stringent BACT for kilns is 0.7 (p. 5)

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

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JUN 19 1990

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HOPPING BOYD GREEN & SAMS

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June 19, 1990

BY HAND DELIVERY

David Schwartz, Esquire
Assistant General Counsel
Florida Department of Environmental
Regulation
2600 Blair Stone Road, Room 654
Tallahassee, Florida 32399-2400

Dear David:

Enclosed is a copy of the Petition that we filed today with the Office of General Counsel regarding the air construction permit for Tarmac's Kiln No. 2.

Very truly yours,

James S. Alves

Schwartz:JSA/gbb

cc: Clair Fancy, P.E.

Enclosure

copied: B. Andrews
J. Reynolds
M. Linn
J. Goldman, SE Dist.
P. Wong, DERM
M. Armentrout, EPA
C. Shaver, NPS

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION

TARMAC FLORIDA, INC., Petitioner, vs. STATE OF FLORIDA, DEPARTMENT OF ENVIRONMENTAL REGULATION, Respondent.	CASE NO. ________

PETITION FOR FORMAL ADMINISTRATIVE PROCEEDINGS

Petitioner, Tarmac Florida, Inc. ("Tarmac" or "Petitioner"), by and through its undersigned counsel, hereby files this petition for formal administrative proceedings pursuant to Section 120.57(1) and Chapter 403, Florida Statutes, and Titles 17 and 28, Florida Administrative Code, in order to challenge certain construction permit conditions set forth in the Department of Environmental Regulation's ("DER", "Department" or "Respondent") March 29, 1990 Notice of Intent to Issue Permit. In support of this Petition, Tarmac states:

IDENTIFICATION OF PARTIES

1. The name, address, and telephone number of the Petitioner is Tarmac Florida, Inc., Post Office Box 2998, Hialeah, Florida, 33102, 305/823-8800.

2. The name and address of the Respondent is State of Florida, Department of Environmental Regulation, 2600 Blair Stone Road, Tallahassee, Florida 32399-2400.

RESPONDENTS' FILE NUMBER AND COUNTY

3. DER has assigned File Nos. AC 13-169901 and PSD-FL-142 to this matter. This Petition relates to a DER air pollution source construction permit to alter the fuel type capability of Kiln No. 2 at Tarmac's facility in Dade County, Florida.

RECEIPT OF NOTICE OF AGENCY ACTION

4. Tarmac received DER's Intent to Issue Permit by U.S. Mail on or about April 4, 1990. The Department extended the time for initiating administrative proceedings to June 19, 1990.

SUBSTANTIAL INTERESTS AFFECTED

5. Tarmac operates a Portland cement manufacturing plant in Dade County that has been in existence for over twenty years. Tarmac has applied to DER for an air pollution source construction permit authorizing conversion of Kiln No. 2 at the facility to burn coal. Tarmac has a very significant investment in the ongoing and efficient operation of the facility, including Kiln No. 2. The proposed coal conversion is essential to Tarmac's ongoing viability in the domestic cement manufacturing industry, which

currently is threatened by foreign importation of cement products. Certain conditions contained in the DER construction permit for Kiln No. 2 are unreasonable, unnecessary, and unauthorized under Chapter 403, Florida Statutes. These conditions would without justification expose Tarmac to oppressive and infeasible operating costs. Therefore, the Intent to Issue Permit substantially and detrimentally impacts Tarmac.

DISPUTED ISSUES OF MATERIAL FACT

6. The disputed issues of material fact involve the sulfur dioxide ("SO_2") and nitrogen oxides ("NO_x") emission limitations proposed by DER as best available control technology ("BACT") in the construction permit. DER's BACT determination, as currently proposed, is arbitrary and capricious. Specific issues of material fact include whether DER, in formulating SO_2 and NO_x BACT limitations applicable to the Kiln No. 2 coal conversion:

a. Is ignoring site-specific emissions data;

b. Is misinterpreting site-specific emissions data;

c. Is improperly comparing different processes and industries to Tarmac's proposed process;

d. Is improperly and insufficiently accounting for economic considerations;

e. Is basing BACT emission limitations on factors not germane to the BACT process;

f. Is incorrect in determining that its proposed BACT limitations are achievable and economically feasible;

g. Is erroneously applying scientific principles to the circumstances at hand;

h. Is improperly applying applicable precedents in the formulation of BACT limitations;

i. Is acting in a manner that is not uniform and consistent with its previous actions on similar or analogous applications; and

j. Is capable of articulating facts and circumstances that justify the incipient agency policy embodied in the Intent to Issue Permit.

FACTS

7. Tarmac operates a Portland cement manufacturing plant in northwest Dade County, just east of the Turnpike Extension and south of U.S. 27. The Tarmac facility consists of three cement kilns, each of which is the subject of current air operation permit issued by DER. Kilns 1 and 2 are permitted to burn natural gas or No. 6 fuel oil, and each has a production capacity of 25.0 tons per hour (TPH) of clinker. Kiln 3 is a larger kiln that is permitted to

burn coal, natural gas, or No. 6 fuel oil and has a capacity of 87.5 TPH clinker.

8. On or about August 31, 1989, Tarmac submitted to DER an application for a construction permit that would authorize conversion of Kiln No. 2 to coal burning capability.

9. The proposed Kiln No. 2 coal conversion will increase emissions of various regulated air pollutants. The United States Environmental Protection Agency ("EPA") and DER have implemented regulations that require prevention of significant deterioration ("PSD") review in conjunction with modifications of existing sources that increase air emissions above specified threshold amounts. Tarmac's application is subject to PSD review. EPA's PSD regulations are found at 40 CFR §§51.166 and 52.21; the PSD program is administered through Florida's EPA-approved State Implementation Plan, which is comprised of applicable portions of Chapter 17-2, Florida Administrative Code. DER's PSD regulations are codified at Florida Administrative Code Rule 17-2.510. These regulations require application of BACT, a term that is defined by Rule 17-2.100(29) as follows:

> An emission limitation, including a visible emissions standard, 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 (including fuel

cleaning or treatment or innovative fuel combustion techniques) for control of each such pollutant.

10. Technical information and analysis required by the PSD regulations was set forth in Tarmac's application. Information pertaining to control technology review, and BACT, was set forth in Section 4.0 of the application.

Tarmac's Strategy i.e. EPA memo agreeing to their proposal

11. Although DER has responsibility for making BACT determinations in Florida, EPA typically comments upon and participates in the process. DER historically adheres to EPA guidance. In December, 1978, EPA published Guidelines for the Evaluation of BACT to assist states in rendering BACT determinations. Late in 1987, EPA issued a memorandum advocating a so-called "top-down" approach to BACT determinations, reflecting a stringent shift in EPA policy that has proven to be controversial. In general, the top-down BACT approach requires that deliberations begin with the most stringent limitation that has been applied to the same source category; the applicant must propose to comply with this limitation unless there are specific facts warranting its rejection, such as site-specific technical or economic infeasibility. More recently, EPA made available a new "draft" top-down BACT guidance document in March, 1990.

12. In its construction permit application, Tarmac proposed that BACT for SO_2 is inherent removal in the kiln. Assuming a minimum removal efficiency of 36%, Tarmac proposed that the SO_2 emission limitation be set at the rate

of 400 lbs./hr. (16.0 lbs./ton of clinker). Moreover, Tarmac proposed that performance tests be undertaken after start-up of Kiln No. 2, and that the SO_2 limitation should thereafter be adjusted downward, as justified.

13. By letter dated October 4, 1989, DER informed Tarmac that EPA had requested additional information on Tarmac's application. More specifically, DER forwarded a draft letter from EPA indicating that PSD/BACT review was required for NO_x, and that Tarmac's analysis of proposed BACT for SO_2 emissions requires consideration of alternatives such as adding a baghouse or utilizing lower sulfur coal.

14. By letter dated November 13, 1989, Tarmac provided detailed responses to EPA's comments and concerns. Tarmac acknowledged that a BACT analysis is required for NO_x, and proposed a BACT limitation of 169.3 lbs./hr. (6.77 lbs./ton clinker). Moreover, Tarmac provided a detailed response to EPA's concerns regarding what constitutes appropriate BACT for SO_2 emissions. Tarmac provided cost figures demonstrating that low sulfur coal is not an economically feasible alternative. Tarmac also provided technical information demonstrating that the potential alternative of adding a baghouse to Kiln No. 2 would not significantly reduce SO_2 emissions and would not be economically feasible. Finally, Tarmac showed that predicting the

inherent SO_2 removal that will occur in Kiln No. 2 is extremely problematic, and reiterated its willingness to accept the lowest limit demonstrably achievable as ultimately gleaned from post-coal conversion operations.

15. EPA issued another letter commenting upon the BACT analysis for the Tarmac coal conversion on December 13, 1990. In this letter, EPA requested additional data on inherent SO_2 removal and on the economic feasibility of utilizing low sulfur coal.

16. By letter dated January 15, 1990, Tarmac provided additional analysis in response to EPA's concerns. In this letter, Tarmac provided detailed information demonstrating that low sulfur coal is not an economically feasible option for Kiln No. 2. With respect to SO_2 removal, Tarmac explained why data from Kiln No. 3 are of limited usefulness for purposes of predicting emissions from Kiln No. 2, and concluded:

> Tarmac does not believe that SO_2 emissions from Kiln 2 will be as high as requested. The problem is, without adequate test data on the kiln, what should the emission limit be? No one knows the answer to this until the kiln can be converted and tested. This is precisely what Tarmac is proposing, and is willing to accept as a permit condition, a testing plan which will define the appropriate emission limit for the kiln. This will avoid the past mistake on Kiln 3 of trying to guess an emission limit that can be met, and guessing wrong.
>
> There seems to be no argument that the control technology for SO_2 removal is the cement kiln itself (i.e., no add-on control equipment). As

such, the cement kiln will without a doubt remove SO_2 and act as an SO_2 removal device whenever it is operating. The amount will be dependent on how the kiln is operated, which will in turn depend on product quality as well as the information obtained from the emission testing. So the only question here is what the appropriate emission limit is. The proposed testing plan will answer this, but this cannot happen until the kiln is operated on coal.

17. Tarmac representatives conferred with EPA officials on January 26, 1990. EPA concurred, based upon information provided by Tarmac, that 1.75 percent (monthly average)/2.0 percent (maximum) sulfur coal is acceptable as BACT for Kiln No. 2. Also, EPA concurred in Tarmac's proposal for a downward adjustment of the proposed initial 400 lbs./hr. SO_2 BACT limitation based upon a series of post-coal conversion emissions tests.

18. By letter dated March 20, 1990, EPA forwarded to DER a letter confirming that Tarmac's explanation of its proposed BACT limitations sufficiently addressed its concerns, and stating that it has no objection to Tarmac's proposal.

19. Tarmac received DER's Intent to Issue Permit on April 4, 1990. In the accompanying Technical Evaluation and Preliminary Determination, and construction permit, DER stated that BACT for SO_2 would be 1.2 lbs./MMBTU (195 lbs./hr.), and that BACT for NO_x would be 0.70 lbs./MMBTU (113.8 lbs./hr.). In setting these limitations, DER ignored and misinterpreted site-specific air emissions data,

arbitrarily compared different industrial operations to Tarmac's operations, refused to consider adequately economic factors, and rejected without explanation Tarmac's proposal for a series of tests resulting in a downward adjustment of its proposed BACT limitation.

20. By letter to DER dated May 23, 1990, Tarmac volunteered to undertake changes in its process whereby the initial SO_2 emission limitation (subject to downward adjustment) for Kiln No. 2 would be 321 lbs./hr., or approximately 20% lower than the proposal acceptable to EPA. DER rejected this proposed limitation.

FACTS REQUIRING MODIFICATION OR REVERSAL OF THE DEPARTMENT'S ACTION

21. Facts requiring modification or reversal of the Department's BACT determination are as follows:

a. For purposes of establishing BACT limitations, dry process cement kilns cannot legitimately be compared with wet process cement kilns, such as Tarmac's;

b. NSPS for fossil fuel steam generators are not appropriate for comparison to Portland cement plants because of fundamental differences in these industries;

c. DER must properly consider the following site-specific factors in the Tarmac BACT determination: wet process plant; kiln size and capacity; raw feed sulfur content; coal sulfur content; existing precipitator for particulate control; and proper interpretation of historic test data from other kilns at the plant;

d. Previous BACT determinations and test data from other wet process kilns (which is very limited) cannot be reflexively applied to Tarmac Kiln No. 2 without considering site-specific distinctions;

e. EPA has approved in writing Tarmac's plan for a one year testing period to confirm an acceptable BACT emission limitation, with Tarmac's proposed emission limitations as a <u>starting point</u> for this determination;

f. DER has ignored site-specific emissions data;

g. DER has misinterpreted site-specific emissions data;

h. DER has improperly compared different processes and industries to Tarmac's operations;

i. DER has improperly and insufficiently accounted for economic considerations;

j. DER's proposed BACT determination is based upon factors not germane to the BACT process;

k. DER's proposed BACT limitations are neither achievable nor economically feasible;

l. DER has erroneously applied scientific principles to the circumstances at hand;

m. DER's BACT determination contravenes applicable precedents;

n. DER has not acted in a manner that is uniform and consistent with its previous actions on similar or analogous applications;

o. DER cannot articulate facts and circumstances that justify the incipient policy embodied in the Intent to Issue Permit and related documents; and

p. Tarmac's EPA-approved proposal is reasonable and comports with applicable regulations.

LAWS ENTITLING PETITIONER TO RELIEF

22. The laws entitling Tarmac to relief in this action include the Clean Air Act (42 U.S.C. §§7401, et seq.); 40 CFR §§51.166 and 52.21; Chapters 120 and 403, Florida Statutes; Titles 17, 22I and 28, Florida Administrative Code; and the United States and State of Florida Constitutions.

RELIEF SOUGHT

23. Tarmac requests that DER determine BACT for Kiln No. 2 in accordance with Tarmac's EPA-approved proposal, and establish an emission limitation for SO_2 of 321 lbs./hr. and for NO_x of 169.3 lbs./hr., with the understanding that data would be collected during initial operations under the construction permit, and that these limitations, accordingly, would be subject to downward adjustment to the maximum extent feasible.

Respectfully submitted this 19th day of June, 1990.

James S. Alves

Wade L. Hopping
James S. Alves
HOPPING BOYD GREEN & SAMS
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(904) 222-7500

Attorneys for Tarmac
Florida, Inc.

TARMACPET:cla

Summary of Maximum Sulfur Dioxide Air Quality Impacts[a], Kiln 2 Coal Conversion

Averaging Time		SO_2 Emission Rate				Ambient Air Quality Standard	
	lb/hr	400	321	275	195		
	lb/ton	16.0	12.84	11.0	7.80		
	lb/MM Btu	2.46	2.14	1.83	1.20	Florida	Dade County
Kiln 2 Only Maximum Impact							
Annual Average ($\mu g/m^3$)		4.1	3.2	2.8	2.0	-	-
24-hour maximum ($\mu g/m^3$)		61	49	42	30	-	-
3-hour maximum ($\mu g/m^3$)		183	147	126	89	-	-
Florida AAQS[b]							
Annual Average ($\mu g/m^3$)		14	13	12	12	60	25
24-hour maximum ($\mu g/m^3$)		73	66	66	66	260	110
3-hour maximum ($\mu g/m^3$)		254	254	254	254	1,300	350
PSD Class II Increments[c]							
Annual Average ($\mu g/m^3$)		5.1	4.8	4.0	3.3	20	-
24-hour maximum ($\mu g/m^3$)		55	53	46	33	91	-
3-hour maximum ($\mu g/m^3$)		162	126	105	69	512	-
PSD Class I Increments[c]							
Annual Average ($\mu g/m^3$)		0.6	0.5	0.5	0.5	2	-
24-hour maximum ($\mu g/m^3$)		4.7	4.4	4.3	4.2	5	-
3-hour maximum ($\mu g/m^3$)		18	18	18	18	25	-

[a]Results are maximums based on maximum emission rate occurring every hour of every year.
[b]Includes impacts due to all sources, plus background.
[c]Includes impacts due to all increment consuming sources.

ATTACHMENT A

Source Contribution to Maximum 24-Hour Impacts (μg/m³) in Class I Area

Source	Tarmac Kiln 2 SO_2 Emission Rate (lb/hr)			
	400	321	275	195
Tarmac Kiln 2	1.31	0.49	0.37	0.26
Tarmac Kiln 3	0.70	0.43	0.40	0.43
Metro Dade Resource Recovery	2.29	3.38	3.44	3.38
South Broward Resource Recovery	0.26	0.05	0.05	0.05
North Broward Resource Recovery	0.01	0.01	0.01	0.01
FPL Lauderdale Cts (prpposed)	2.87	0.72	0.78	0.72
FPL Units 4 and 5 Offset (proposed)	-2.73	-0.68	-0.75	-0.68
Total	4.7	4.4	4.3	4.2

Note: Class I PSD increment is 5.0 μg/m³ for 24-hour averaging time.

For Routing To Other Than The Addressee	
To:	Location:
To:	Location:
To:	Location:
From:	Date:

State of Florida
DEPARTMENT OF ENVIRONMENTAL REGULATION

Interoffice Memorandum

RECEIVED
FEB 11 1991
Office of the Secretary

TO: Carol M. Browner

FROM: Steve Smallwood

DATE: January 25, 1991

SUBJ: Approval of Construction Permit AC 13-169901, PSD-FL-142
Tarmac Florida, Inc.

Attached for your approval and signature is a permit prepared by the Bureau of Air Regulation for the above mentioned company to convert kiln No. 2 to coal firing at Tarmac, Inc. in Medley, Dade County, Florida.

Comments were received during the public notice period. The final permit has been modified in accordance with the Department's final order issued on December 7, 1990 in OGC Case No. 90-0954.

I recommend your approval and signature.

SS/JR/plm

Attachments

Signed

Steve — was the permit amendment such that it satisfies the parties who raised concerns during the public notice period? Carol

The coments by the EPA, National Park Service and the Dade County Department of Environmental Resources Managmt addressed in more detail in Final Determination.

Yes, see the expanded version of the Final determination (next 2 pages) 2-11-91

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION

TARMAC OF FLORIDA, INC.,

Petitioner

vs.

DOAH CASE NO. 90-3852
OGC FILE NO. 90-0954

STATE OF FLORIDA DEPARTMENT
OF ENVIRONMENTAL REGULATION,

Respondent.
______________________________/

FINAL ORDER

On June 19, 1990, the State of Florida Department of Environmental Regulation ("Department") received a petition for administrative hearing from Petitioner, TARMAC OF FLORIDA, INC. The petition challenged the Department's decision to include specific conditions 3, 4, and 5 in Permit No. 13-169901 to convert their kiln no. 2 to coal firing at their facility in Medley in Dade County.

On September 28, 1990, the assigned Hearing Officer issued and Order Granting Consolidation of Edmund F. Benson v. Tarmac of Florida, Inc., & DER, OGC file no. 90-1364, DOAH file no. 90-5827 with the above-styled case. On November 21, 1990, after Petitioner failed to timely respond to the Order Granting Motion for More Definite Statement issued on September 26, 1990, the assigned Hearing Officer issued an Order which severed the Benson case from Tarmac of Florida, Inc. v. DER and closed that Division of Administrative Hearings file and relinquished jurisdiction back to the Department.

On December 3, 1990, after receiving a Stipulation for Dismissal, the assigned Hearing Officer issued an Order which closed the Division of Administrative Hearings file and relinquished jurisdiction back to the Department. (Exhibit 1) There being no further matters to consider,

IT IS ORDERED:

The petition is hereby dismissed and the Department's Southeast District Office is directed to issue Permit No. 13-169901 in accordance with the Stipulation. (Exhibit 2)

Any party to this Order has the right to seek judicial review of the Order pursuant to Section 120.68, Florida Statutes, by the filing of a Notice of Appeal pursuant to Rule 9.110, Florida Rules of Appellate Procedure, with the clerk of the Department in the Office of General Counsel, 2600 Blair Stone Road, Tallahassee, Florida 32399-2400; and by filing a copy of the Notice of Appeal accompanied by the applicable filing fees with the appropriate District Court of Appeal. the Notice of Appeal must be filed within 30 days from the date this Order is filed with the clerk of the Department.

DONE AND ORDERED this 7 day of December, 1990, in Tallahassee, Florida.

STATE OF FLORIDA DEPARTMENT
OF ENVIRONMENTAL REGULATION

Dale Twachtmann

DALE TWACHTMANN
Secretary
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, FL 32399-2400

CERTIFICATE OF SERVICE

I HEREBY CERTIFY that a true and correct copy of the foregoing FINAL ORDER has been furnished by U.S. Mail to James S. Alves, Esq., Hopping Boyd Green & Sams, P.O. Box 6526, Tallahassee, FL 32314, on this 10th day of December 1990.

STATE OF FLORIDA DEPARTMENT
OF ENVIRONMENTAL REGULATION

Patricia E. Comer

Patricia E. Comer
Assistant General Counsel

Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, FL 32399-2400
Telephone: (904) 488-4805

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION

TARMAC FLORIDA, INC., Petitioner,	)	
vs.	)	CASE NO. 90-3852
DEPARTMENT OF ENVIRONMENTAL REGULATION, Respondent.	)	

STIPULATION FOR DISMISSAL

Pursuant to Florida Administrative Code rule 22I-6.033, Petitioner Tarmac Florida, Inc. ("Tarmac" or "Petitioner") and Respondent State of Florida Department of Environmental Regulation ("Department" or "Respondent") jointly file this Stipulation for Dismissal and request the Hearing Officer enter an order incorporating same and dismissing this case in accordance therewith. The parties jointly agree:

1. This proceeding relates to Tarmac's application to the Department for an air pollution source construction permit authorizing conversion (to burn coal) of Kiln No. 2 at Tarmac's facility in Dade County. In its Petition for Administrative Proceedings, filed on June 19, 1990, Tarmac contested certain SO_2 and NO_x limitations applicable to Kiln No. 2 as set forth in the Intent to Issue Permit (PSD-FL-142) and accompanying documents that it received from the Department on April 4, 1990.

EXHIBIT 2

2. The parties have agreed to a mutually acceptable resolution of the issues raised in Tarmac's Petition. The terms of this resolution are set forth below in subparagraphs a., b., c., d., and e.

a. The Department will alter the specific conditions set forth in PSD-FL-142 as follows:

> 3. Sulfur dioxide emissions from kiln No. 2 shall not exceed ~~1.2 lbs/MMBtu heat input input from coal combustion,~~ 7.8 lbs/ton of clinker produced, 195.0 lbs/hr, 768.7 tons/yr.
>
> 4. Sulfuric acid mist emissions from kiln No. 2 shall not exceed ~~0.036 lbs/MMBtu heat input from coal combustion,~~ 0.23 lbs/ton of clinker produced, 5.86 lbs/hr, 23.06 tons/yr.
>
> 5. Nitrogen oxides emissions from kiln No. 2 shall not exceed ~~0.7 lbs/MMBtu heat input from coal combustion,~~ 4.55 lbs/ton of clinker produced, 113.8 lbs/hr, 448.4 tons/yr.
>
> * * *
>
> 11. Tarmac shall conduct a series of compliance tests for SO_2, H_2SO_4 mist, and NO_x emissions every two months for up to one year to allow representative sampling during different times of the year. The tests shall be performed in accordance with the compliance test methods specified in this permit. In the event that this series of tests results in SO_2 emissions in the range of 195 to 275 lbs/hr (up to 11 lbs/ton clinker, 1,084.1 TPY), NO_x emissions in the range of 113.8 to 169.3 lbs/hr (up to 6.77 lbs/ton clinker, 667.2 TPY), or H_2SO_4 mist emissions in the range of 5.86 to 8.25 lbs/hr (up to 0.33 lbs/ton clinker, 32.52 TPY), the Department, if requested by the Permittee, shall reevaluate BACT and consider upward adjustments of the emission limitations for the indicated constituents based on available data. During this testing and evaluation period, the Permittee shall make reasonable efforts to limit air emissions, and the

Department shall not initiate enforcement proceedings. Any upward adjustment of emission limitations pursuant to this paragraph shall be the subject of public notice in a local newspaper pursuant to Department rules. The Department's determination based on the data produced under this paragraph shall be a point of entry for purposes of Section 120.57, Florida Statutes.

b. Specific Condition No. 11, above, will be entirely new, and subsequent conditions shall be renumbererd accordingly.

c. The Department will append to the Final BACT Determination accompanying PSD-FL-142 data reflecting the amount and percentage of SO_2 increment consumed in Class I and Class II areas in conjunction with the emission rates of 195 lbs/hr and 275 lbs/hr, respectively. This data is attached hereto as Attachment A.

d. The expiration date of PSD-FL-142 shall be June 30, 1992.

e. The referenced air permit, PSD-FL-142, shall be issued by the Department in final form, in accordance with subparagraphs a., b., c., and d., by no later than December 12, 1990.

WHEREFORE, Petitioner and Respondent respectfully request entry of an order incorporating this Stipulation for Dismissal and dismissing this case.

Respectfully submitted this _____ day of November, 1990.

DEPARTMENT OF ENVIRONMENTAL REGULATION

Patricia E. Comer

Patricia E. Comer
Assistant General Counsel
Twin Towers Office Building
2600 Blair Stone Road, #654
Tallahassee, FL 32399-2400
(904) 488-9730

Attorney for Respondent

Date November 26, 1990

HOPPING BOYD GREEN & SAMS

____

James S. Alves
123 South Calhoun Street
Post Office Box 6526
Tallahassee, FL 32314
(904) 222-7500

Attorneys for Petitioner

Date _______________________

CERTIFICATE OF SERVICE

I HEREBY CERTIFY that a true and correct copy of the foregoing Stipulation for Dismissal has been furnished by hand-delivery to Patricia E. Comer, Esquire, Department of Environmental Regulation, Towers Office Building, 2600 Blair Stone Road, Tallahassee, Florida 32399-2400.

Attorney

/kkm:TARMACdism

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION

EDMUND F. BENSON,

Petitioner,

vs.

DOAH CASE NO. 90-5827
OGC CASE NO. 90-1364

TARMAC OF FLORIDA, INC., and STATE OF FLORIDA DEPARTMENT OF ENVIRONMENTAL REGULATION,

Respondents.

_______________________________/

FINAL ORDER

On August 31, 1990, the State of Florida Department of Environmental Regulation ("Department") received a petition for administrative hearing from Petitioner, EDMUND F. BENSON. The petition challenged the Department's decision to issue Permit No. 13-169901 to TARMAC OF FLORIDA, INC., to convert their kiln no. 2 to coal firing at their facility in Medley in Dade County.

On September 28, 1990, the assigned Hearing Officer issued an Order Granting Consolidation of the above styled case with Tarmac of Florida, Inc. v. DER, OGC file no. 90-0954 and DOAH file no. 90-3852. On November 21, 1990, after Petitioner failed to timely respond to the Order Granting Motion for More Definite Statement issued on September 26, 1990, the assigned Hearing Officer issued an Order which severed the above styled case from Tarmac of Florida, Inc. v. DER and closed the Division of Administrative Hearings file and relinquished jurisdiction back to the Department. (Exhibit 1) There being no further matters to consider,

RECEIVED
DEC 5 1990
Dept. of Environmental Reg.
Office of General Counsel

STATE OF FLORIDA
DIVISION OF ADMINISTRATIVE HEARINGS

TARMAC FLORIDA, INC.,

Petitioner,

v.

DEPARTMENT OF ENVIRONMENTAL REGULATION,

Respondent.

CASE NO. 90-3852

ORDER CLOSING FILE

On November 26, 1990, the parties filed a Stipulation for Dismissal which represented that the parties have resolved the issues of the case and that hearing is, therefore, no longer necessary. That stipulation requests that their agreement be incorporated into the dismissal of this matter. Based upon the foregoing, it is

ORDERED:

1. Jurisdiction in this case is hereby relinquished to the Department for such further action as may be appropriate to complete the terms of the parties' stipulation.

2. The file of the Division of Administrative Hearings in the above-styled matter, Case no. 90-3852, is hereby CLOSED.

DONE AND ENTERED this 3 day of December, 1990, in Tallahassee, Leon County, Florida.

Joyous D. Parrish

JOYOUS D. PARRISH
Hearing Officer
Division of Administrative Hearings
The DeSoto Building
1230 Apalachee Parkway
Tallahassee, Florida 32399-1550
(904)488-9675

EXHIBIT 1

IT IS ORDERED:

The petition is hereby dismissed.

Any party to this Order has the right to seek judicial review of the Order pursuant to Section 120.68, Florida Statutes, by the filing of a Notice of Appeal pursuant to Rule 9.110, Florida Rules of Appellate Procedure, with the clerk of the Department in the Office of General Counsel, 2600 Blair Stone Road, Tallahassee, Florida 32399-2400; and by filing a copy of the Notice of Appeal accompanied by the applicable filing fees with the appropriate District Court of Appeal. The Notice of Appeal must be filed within 30 days from the date this Order is filed with the clerk of the Department.

DONE AND ORDERED this 7 day of ~~November~~ December, 1990, in Tallahassee, Florida.

STATE OF FLORIDA DEPARTMENT
OF ENVIRONMENTAL REGULATION

Dale Twachtmann

DALE TWACHTMANN
Secretary

Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400
Telephone: (904)488-4805

CERTIFICATE OF SERVICE

I HEREBY CERTIFY that a true and correct copy of the foregoing FINAL ORDER has been furnished by U.S. Mail to Edmund F. Benson, 4001 Edmund F. Benson Blvd., Miami, FL 33178-2384, and to James S. Alves, Esq., Hopping Boyd Green & Sams, P.O. Box 6526, Tallahassee, FL 32314, on this 10th day of December, 1990.

STATE OF FLORIDA DEPARTMENT
OF ENVIRONMENTAL REGULATION

Patricia E. Comer

Patricia E. Comer
Assistant General Counsel

Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, FL 32399-2400
Telephone: (904) 488-9730

3. The file of the Division of Administrative Hearings in case no. 90-5827 is hereby closed.

DONE AND ENTERED this 21 day of November, 1990, in Tallahassee, Leon County, Florida.

Joyous D. Parrish

JOYOUS D. PARRISH
Hearing Officer
Division of Administrative Hearings
The DeSoto Building
1230 Apalachee Parkway
Tallahassee, Florida 32399-1550
(904)488-9675

FILED with the Clerk of the
Division of Administrative Hearings
this 21st day of November, 1990.

Copies furnished:

Patricia E. Comer
Department of Environmental
Regulation
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

James Alves
Hopping, Boyd, Green & Sams
P.O. Box 6526
Tallahassee, Florida 32314

Edmund F. Benson
4001 Edmund F. Benson Boulevard
Miami, Florida 33178-2384

Dale H. Twachtmann, Secretary
Department of Environmental
Regulation
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Daniel H. Thompson
General Counsel
Department of Environmental
Regulation
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

RECEIVED
NOV 26 1990
Dept. of Environmental Reg.
Office of General Counsel

STATE OF FLORIDA
DIVISION OF ADMINISTRATIVE HEARINGS

EDMUND F. BENSON,

Petitioner,

vs.

DEPARTMENT OF ENVIRONMENTAL REGULATION and TARMAC OF FLORIDA, INC.,

Respondents.

CASE NO. 90-5827

RECOMMENDED ORDER OF DISMISSAL

On September 26, 1990, an Order Granting Motion for More Definite Statement was entered by Hearing Officer Donald D. Conn. That order required the Petitioner to file, within fifteen days of the order, a more definite statement which fully and completely complies with Rule 17-103.155(2), Florida Administrative Code. Additionally, that order notified the Petitioner that the failure to timely respond to the order would result in the dismissal of the the case. To date, Petitioner has not complied with that order. Based upon the foregoing, it is

ORDERED:

1. The above-styled matter, case no. 90-5827, is hereby severed from the case with which it had previously been consolidated (Tarmac Florida, Inc. v. Department of Environmental Regulation, case no. 90-3852).

2. Pursuant to Rule 22I-6.016, Florida Administrative Code, it is hereby recommended that the Department of Environmental Regulation enter a final order dismissing the Petitioner's request in this case.

EXHIBIT 1

FILED with the Clerk of the
Division of Administrative Hearings
this 3 day of December, 1990.

Copies furnished:

Patricia E. Comer
Assistant General Counsel
Department of Environmental
Regulation
Twin Towers Office Building
2600 Blair Stone Road, #654
Tallahassee, Florida 32399-2400

James S. Alves
HOPPING BOYD GREEN & SAMS
123 South Calhoun Street
Post Office Box 6526
Tallahassee, Florida 32314

City of
MIAMI SPRINGS
Florida

RECEIVED
SEP 17 1990
DER - BAQM

BUILDING AND ZONING DEPARTMENT
201 WESTWARD DRIVE
MIAMI SPRINGS, FL 33166

TELEPHONE
(305) 885-4581

Mr. Barry Andrews
Bureau of Air Regulation
FLORIDA DEPARTMENT OF ENVIRONMENTAL REGULATION
2600 Blair Stone Road
Tallahassee, Florida 32399

September 10, 1990

RE: Tarmac Florida, Inc., Kiln 2 Coal Conversion #AC-13-169901
Dade County, Florida
Division of Administrative Hearings Case Number #90-3852

Dear Mr. Andrews:

The City of Miami Springs requests that you provide the City with a copy of the Florida Department of Environmental Regulation "Technical Evaluation and Preliminary Determination" of Best Available Control Technology for Prevention of Significant Deterioration of air quality, for the above captioned Permit.

Thank you for your kind attention to this request.

Sincerely yours,

Steve Johnson

Steve Johnson
City Planner

CC: Dodd A. Southern, City Manager
Bill MacDonald, Assistant City Manager

TARMAC FLORIDA, INC.

P.O. Box 2998
Hialeah, Florida 33012

AUG 13 1990

DER - BAQM

August 9, 1990

Mr. Clair Fancy, P.E., Chief
Bureau of Air Regulation
Fla. Dept. of Environmental Regulation
Twin Towers Office Bldg.
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

RE: Proposed Modification - Kiln No. 2 Coal Conversion
DER File No. AC13-169901

Dear Mr. Fancy:

Please find enclosed a copy of the affidavit of publication for the *Notice of Intent to Issue Permit* for the above referenced project. Should you have any questions please call me at (305)823-8800.

Sincerely,

Scott Quaas
Environmental Specialist

cc: J. Alves - Hopping Boyd Green & Sams

BEST AVAILABLE COPY

TARMAC FLORIDA, INC.
P.O. Box 2998
Hialeah, Florida 33012

Mr. Clair Fancy, P.E., Chief
Bureau of Air Regulation
Fla. Dept. of Environmental Regulation
Twin Towers Office Bldg.
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

The Miami Herald

PUBLISHED DAILY
MIAMI — DADE — FLORIDA

STATE OF FLORIDA
COUNTY OF DADE:

Before the undersigned authority personally appeared

OLGA L. ARCIA

who on oath says that he/she is

CUSTODIAN OF RECORDS

of The Miami Herald, a daily newspaper published at Miami in Dade County, Florida; that the attached copy of advertisement was published in said newspaper in the issues of

AUGUST 7, 1990

Affiant further says that the said The Miami Herald is a newspaper published at Miami, in the said Dade County, Florida and that the said newspaper has heretofore been continuously published in said Dade County, Florida, each day and has been entered as second class mail matter at the post office in Miami, in said Dade County, Florida, for a period of one year next preceding the first publication of the attached copy of advertisement; and affiant further says that he has neither paid nor promised any person, firm or corporation any discount, rebate, commission or refund for the purpose of securing this advertisement for publication in the said newspaper.

Olga L. Arcia

Sworn to and subscribed before me this 7th

day of August A.D. 1990

My commission expires [signature]

NOTARY PUBLIC STATE OF FLORIDA
MY COMMISSION EXP. MAR 15, 1991
BONDED THRU GENERAL INS. UND.

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 18.6 vs. 25 allowable 3-hour average, 4.1 vs. 5 allowable 24-hour average, an 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, 66.1 vs. 91 allowable 24-hour average, and 5.1 vs. 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 Priliminary 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 acton may be different from the position taken by it in this Notice. Persons whose substantial interests will be affected by any decision 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) with 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
1900 S. Congress Avenue,
Suite A
West Palm Beach, Florida
33406

Dade County Dept. 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.

HOPPING BOYD GREEN & SAMS
ATTORNEYS AND COUNSELORS
123 SOUTH CALHOUN STREET
POST OFFICE BOX 6526
TALLAHASSEE, FLORIDA 32314
(904) 222-7500
FAX (904) 224-8551

RECEIVED
JUN 19 1990
DER - BAQM

June 19, 1990

BY HAND DELIVERY

David Schwartz, Esquire
Assistant General Counsel
Florida Department of Environmental
Regulation
2600 Blair Stone Road, Room 654
Tallahassee, Florida 32399-2400

Dear David:

Enclosed is a copy of the Petition that we filed today with the Office of General Counsel regarding the air construction permit for Tarmac's Kiln No. 2.

Very truly yours,

Jim

James S. Alves

Schwartz:JSA/gbb

cc: Clair Fancy, P.E.

Enclosure

copied: B. Andrews
J. Reynolds
M. Zinn
J. Goldman, SE Dist.
P. Wong: DERM
M. Armentrout, EPA
C. Shaver, NPS

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL REGULATION

TARMAC FLORIDA, INC., Petitioner, vs. STATE OF FLORIDA, DEPARTMENT OF ENVIRONMENTAL REGULATION, Respondent.	CASE NO. ________

PETITION FOR FORMAL ADMINISTRATIVE PROCEEDINGS

Petitioner, Tarmac Florida, Inc. ("Tarmac" or "Petitioner"), by and through its undersigned counsel, hereby files this petition for formal administrative proceedings pursuant to Section 120.57(1) and Chapter 403, Florida Statutes, and Titles 17 and 28, Florida Administrative Code, in order to challenge certain construction permit conditions set forth in the Department of Environmental Regulation's ("DER", "Department" or "Respondent") March 29, 1990 Notice of Intent to Issue Permit. In support of this Petition, Tarmac states:

IDENTIFICATION OF PARTIES

1. The name, address, and telephone number of the Petitioner is Tarmac Florida, Inc., Post Office Box 2998, Hialeah, Florida, 33102, 305/823-8800.

2. The name and address of the Respondent is State of Florida, Department of Environmental Regulation, 2600 Blair Stone Road, Tallahassee, Florida 32399-2400.

RESPONDENTS' FILE NUMBER AND COUNTY

3. DER has assigned File Nos. AC 13-169901 and PSD-FL-142 to this matter. This Petition relates to a DER air pollution source construction permit to alter the fuel type capability of Kiln No. 2 at Tarmac's facility in Dade County, Florida.

RECEIPT OF NOTICE OF AGENCY ACTION

4. Tarmac received DER's Intent to Issue Permit by U.S. Mail on or about April 4, 1990. The Department extended the time for initiating administrative proceedings to June 19, 1990.

SUBSTANTIAL INTERESTS AFFECTED

5. Tarmac operates a Portland cement manufacturing plant in Dade County that has been in existence for over twenty years. Tarmac has applied to DER for an air pollution source construction permit authorizing conversion of Kiln No. 2 at the facility to burn coal. Tarmac has a very significant investment in the ongoing and efficient operation of the facility, including Kiln No. 2. The proposed coal conversion is essential to Tarmac's ongoing viability in the domestic cement manufacturing industry, which

currently is threatened by foreign importation of cement products. Certain conditions contained in the DER construction permit for Kiln No. 2 are unreasonable, unnecessary, and unauthorized under Chapter 403, Florida Statutes. These conditions would without justification expose Tarmac to oppressive and infeasible operating costs. Therefore, the Intent to Issue Permit substantially and detrimentally impacts Tarmac.

DISPUTED ISSUES OF MATERIAL FACT

6. The disputed issues of material fact involve the sulfur dioxide ("SO_2") and nitrogen oxides ("NO_x") emission limitations proposed by DER as best available control technology ("BACT") in the construction permit. DER's BACT determination, as currently proposed, is arbitrary and capricious. Specific issues of material fact include whether DER, in formulating SO_2 and NO_x BACT limitations applicable to the Kiln No. 2 coal conversion:

a. Is ignoring site-specific emissions data;

b. Is misinterpreting site-specific emissions data;

c. Is improperly comparing different processes and industries to Tarmac's proposed process;

d. Is improperly and insufficiently accounting for economic considerations;

e. Is basing BACT emission limitations on factors not germane to the BACT process;

f. Is incorrect in determining that its proposed BACT limitations are achievable and economically feasible;

g. Is erroneously applying scientific principles to the circumstances at hand;

h. Is improperly applying applicable precedents in the formulation of BACT limitations;

i. Is acting in a manner that is not uniform and consistent with its previous actions on similar or analogous applications; and

j. Is capable of articulating facts and circumstances that justify the incipient agency policy embodied in the Intent to Issue Permit.

FACTS

7. Tarmac operates a Portland cement manufacturing plant in northwest Dade County, just east of the Turnpike Extension and south of U.S. 27. The Tarmac facility consists of three cement kilns, each of which is the subject of current air operation permit issued by DER. Kilns 1 and 2 are permitted to burn natural gas or No. 6 fuel oil, and each has a production capacity of 25.0 tons per hour (TPH) of clinker. Kiln 3 is a larger kiln that is permitted to

burn coal, natural gas, or No. 6 fuel oil and has a capacity of 87.5 TPH clinker.

8. On or about August 31, 1989, Tarmac submitted to DER an application for a construction permit that would authorize conversion of Kiln No. 2 to coal burning capability.

9. The proposed Kiln No. 2 coal conversion will increase emissions of various regulated air pollutants. The United States Environmental Protection Agency ("EPA") and DER have implemented regulations that require prevention of significant deterioration ("PSD") review in conjunction with modifications of existing sources that increase air emissions above specified threshold amounts. Tarmac's application is subject to PSD review. EPA's PSD regulations are found at 40 CFR §§51.166 and 52.21; the PSD program is administered through Florida's EPA-approved State Implementation Plan, which is comprised of applicable portions of Chapter 17-2, Florida Administrative Code. DER's PSD regulations are codified at Florida Administrative Code Rule 17-2.510. These regulations require application of BACT, a term that is defined by Rule 17-2.100(29) as follows:

> An emission limitation, including a visible emissions standard, 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 (including fuel

cleaning or treatment or innovative fuel combustion techniques) for control of each such pollutant.

10. Technical information and analysis required by the PSD regulations was set forth in Tarmac's application. Information pertaining to control technology review, and BACT, was set forth in Section 4.0 of the application.

11. Although DER has responsibility for making BACT determinations in Florida, EPA typically comments upon and participates in the process. DER historically adheres to EPA guidance. In December, 1978, EPA published Guidelines for the Evaluation of BACT to assist states in rendering BACT determinations. Late in 1987, EPA issued a memorandum advocating a so-called "top-down" approach to BACT determinations, reflecting a stringent shift in EPA policy that has proven to be controversial. In general, the top-down BACT approach requires that deliberations begin with the most stringent limitation that has been applied to the same source category; the applicant must propose to comply with this limitation unless there are specific facts warranting its rejection, such as site-specific technical or economic infeasibility. More recently, EPA made available a new "draft" top-down BACT guidance document in March, 1990.

12. In its construction permit application, Tarmac proposed that BACT for SO_2 is inherent removal in the kiln. Assuming a minimum removal efficiency of 36%, Tarmac proposed that the SO_2 emission limitation be set at the rate

of 400 lbs./hr. (16.0 lbs./ton of clinker). Moreover, Tarmac proposed that performance tests be undertaken after start-up of Kiln No. 2, and that the SO_2 limitation should thereafter be adjusted downward, as justified.

13. By letter dated October 4, 1989, DER informed Tarmac that EPA had requested additional information on Tarmac's application. More specifically, DER forwarded a draft letter from EPA indicating that PSD/BACT review was required for NO_x, and that Tarmac's analysis of proposed BACT for SO_2 emissions requires consideration of alternatives such as adding a baghouse or utilizing lower sulfur coal.

14. By letter dated November 13, 1989, Tarmac provided detailed responses to EPA's comments and concerns. Tarmac acknowledged that a BACT analysis is required for NO_x, and proposed a BACT limitation of 169.3 lbs./hr. (6.77 lbs./ton clinker). Moreover, Tarmac provided a detailed response to EPA's concerns regarding what constitutes appropriate BACT for SO_2 emissions. Tarmac provided cost figures demonstrating that low sulfur coal is not an economically feasible alternative. Tarmac also provided technical information demonstrating that the potential alternative of adding a baghouse to Kiln No. 2 would not significantly reduce SO_2 emissions and would not be economically feasible. Finally, Tarmac showed that predicting the

inherent SO_2 removal that will occur in Kiln No. 2 is extremely problematic, and reiterated its willingness to accept the lowest limit demonstrably achievable as ultimately gleaned from post-coal conversion operations. -

15. EPA issued another letter commenting upon the BACT analysis for the Tarmac coal conversion on December 13, 1990. In this letter, EPA requested additional data on inherent SO_2 removal and on the economic feasibility of utilizing low sulfur coal.

16. By letter dated January 15, 1990, Tarmac provided additional analysis in response to EPA's concerns. In this letter, Tarmac provided detailed information demonstrating that low sulfur coal is not an economically feasible option for Kiln No. 2. With respect to SO_2 removal, Tarmac explained why data from Kiln No. 3 are of limited usefulness for purposes of predicting emissions from Kiln No. 2, and concluded:

> Tarmac does not believe that SO_2 emissions from Kiln 2 will be as high as requested. The problem is, without adequate test data on the kiln, what should the emission limit be? No one knows the answer to this until the kiln can be converted and tested. This is precisely what Tarmac is proposing, and is willing to accept as a permit condition, a testing plan which will define the appropriate emission limit for the kiln. This will avoid the past mistake on Kiln 3 of trying to guess an emission limit that can be met, and guessing wrong.
>
> There seems to be no argument that the control technology for SO_2 removal is the cement kiln itself (i.e., no add-on control equipment). As

such, the cement kiln will without a doubt remove SO_2 and act as an SO_2 removal device whenever it is operating. The amount will be dependent on how the kiln is operated, which will in turn depend on product quality as well as the information obtained from the emission testing. So the only question here is what the appropriate emission limit is. The proposed testing plan will answer this, but this cannot happen until the kiln is operated on coal.

17. Tarmac representatives conferred with EPA officials on January 26, 1990. EPA concurred, based upon information provided by Tarmac, that 1.75 percent (monthly average)/2.0 percent (maximum) sulfur coal is acceptable as BACT for Kiln No. 2. Also, EPA concurred in Tarmac's proposal for a downward adjustment of the proposed initial 400 lbs./hr. SO_2 BACT limitation based upon a series of post-coal conversion emissions tests.

18. By letter dated March 20, 1990, EPA forwarded to DER a letter confirming that Tarmac's explanation of its proposed BACT limitations sufficiently addressed its concerns, and stating that it has no objection to Tarmac's proposal.

19. Tarmac received DER's Intent to Issue Permit on April 4, 1990. In the accompanying Technical Evaluation and Preliminary Determination, and construction permit, DER stated that BACT for SO_2 would be 1.2 lbs./MMBTU (195 lbs./hr.), and that BACT for NO_x would be 0.70 lbs./MMBTU (113.8 lbs./hr.). In setting these limitations, DER ignored and misinterpreted site-specific air emissions data,

arbitrarily compared different industrial operations to Tarmac's operations, refused to consider adequately economic factors, and rejected without explanation Tarmac's proposal for a series of tests resulting in a downward adjustment of its proposed BACT limitation.

20. By letter to DER dated May 23, 1990, Tarmac volunteered to undertake changes in its process whereby the initial SO_2 emission limitation (subject to downward adjustment) for Kiln No. 2 would be 321 lbs./hr., or approximately 20% lower than the proposal acceptable to EPA. DER rejected this proposed limitation.

FACTS REQUIRING MODIFICATION OR REVERSAL OF THE DEPARTMENT'S ACTION

21. Facts requiring modification or reversal of the Department's BACT determination are as follows:

a. For purposes of establishing BACT limitations, dry process cement kilns cannot legitimately be compared with wet process cement kilns, such as Tarmac's;

b. NSPS for fossil fuel steam generators are not appropriate for comparison to Portland cement plants because of fundamental differences in these industries;

c. DER must properly consider the following site-specific factors in the Tarmac BACT determination: wet process plant; kiln size and capacity; raw feed sulfur content; coal sulfur content; existing precipitator for particulate control; and proper interpretation of historic test data from other kilns at the plant;

d. Previous BACT determinations and test data from other wet process kilns (which is very limited) cannot be reflexively applied to Tarmac Kiln No. 2 without considering site-specific distinctions;

e. EPA has approved in writing Tarmac's plan for a one year testing period to confirm an acceptable BACT emission limitation, with Tarmac's proposed emission limitations as a <u>starting point</u> for this determination;

f. DER has ignored site-specific emissions data;

g. DER has misinterpreted site-specific emissions data;

h. DER has improperly compared different processes and industries to Tarmac's operations;

i. DER has improperly and insufficiently accounted for economic considerations;

j. DER's proposed BACT determination is based upon factors not germane to the BACT process;

k. DER's proposed BACT limitations are neither achievable nor economically feasible;

l. DER has erroneously applied scientific principles to the circumstances at hand;

m. DER's BACT determination contravenes applicable precedents;

n. DER has not acted in a manner that is uniform and consistent with its previous actions on similar or analogous applications;

o. DER cannot articulate facts and circumstances that justify the incipient policy embodied in the Intent to Issue Permit and related documents; and

p. Tarmac's EPA-approved proposal is reasonable and comports with applicable regulations.

LAWS ENTITLING PETITIONER TO RELIEF

22. The laws entitling Tarmac to relief in this action include the Clean Air Act (42 U.S.C. §§7401, et seq.); 40 CFR §§51.166 and 52.21; Chapters 120 and 403, Florida Statutes; Titles 17, 22I and 28, Florida Administrative Code; and the United States and State of Florida Constitutions.

RELIEF SOUGHT

23. Tarmac requests that DER determine BACT for Kiln No. 2 in accordance with Tarmac's EPA-approved proposal, and establish an emission limitation for SO_2 of 321 lbs./hr. and for NO_x of 169.3 lbs./hr., with the understanding that data would be collected during initial operations under the construction permit, and that these limitations, accordingly, would be subject to downward adjustment to the maximum extent feasible.

Respectfully submitted this 19th day of June, 1990.

James S. Alves

Wade L. Hopping
James S. Alves
HOPPING BOYD GREEN & SAMS
Post office Box. 6526
Tallahassee, FL 32314
(904) 222-7500

Attorneys for Tarmac
Florida, Inc.

TARMACPET:cla

HOPPING BOYD GREEN & SAMS
ATTORNEYS AND COUNSELORS
123 SOUTH CALHOUN STREET
POST OFFICE BOX 6526
TALLAHASSEE, FLORIDA 32314
(904) 222-7500
FAX (904) 224-8551

June 11, 1990

BY HAND-DELIVERY

Mr. Clair Fancy, P.E., Chief
Bureau of Air Regulation
Florida Department of Environmental Regulation
Room 306F, Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Re: Tarmac Kiln No. 2 Conversion
DER File No. AC13-169901

Dear Clair:

On May 22, 1990, representatives of the Department and Tarmac met in your office to discuss outstanding areas of disagreement regarding the Department's proposed BACT determination for the above-referenced project. The Department stated that it would take Tarmac's points under advisement and respond early in June. My impression was that the Department agreed that the NO_x limitation needed to be adjusted, and that there may be room for movement on the SO_2 limitation, albeit not to the degree that Tarmac requested.

Shortly after our meeting, and after a follow-up telephone conference with David Schwartz, I filed a request for extension of the time to challenge the Department's BACT determination to June 19, 1990 (copy attached). Meanwhile, Al Townsend of Tarmac sent a letter to you (copy attached) substantially backing off of Tarmac's original requested BACT limitations, and seeking a compromise resolution.

The June 19 deadline is quickly approaching, and I still have not seen an official reply from the Department in response to Tarmac's proposed compromise. If at all possible, I would greatly appreciate hearing from the Department on this by no later than June 15.

I sincerely hope that the Department will work with Tarmac to arrive at a mutually acceptable solution to the issue at hand. The folks at Tarmac, certainly, have provided valid technical data and scientific information in support of their position, and, after undertaking some soul searching, have exhibited good faith efforts towards arriving at an amicable resolution. I trust that the Department, too, will strive to reach a principled and reasonable compromise.

Very truly yours,

Jim

James S. Alves

/lsd

Enclosures

cc: (w/enclosures)
Steve Smallwood
Barry Andrews
David Schwartz

HOPPING BOYD GREEN & SAMS
ATTORNEYS AND COUNSELORS
123 SOUTH CALHOUN STREET
POST OFFICE BOX 6526
TALLAHASSEE, FLORIDA 32314
(904) 222-7500
FAX (904) 224-8551

June 1, 1990

BY HAND DELIVERY

Dale H. Twachtmann, Secretary
c/o David Schwartz, Esquire
Office of General Counsel
Florida Department of Environmental
Regulation
2600 Blair Stone Road, Room 654
Tallahassee, Florida 32399-2400

Re: Tarmac
Kiln No. 2 Coal Conversion
DER File No. AC13-169901
PSD-FL-142

Dear Secretary Twachtmann:

On April 4, 1990, Tarmac received the Department's Notice of Intent to Issue Permit for the above-referenced facility. Tarmac timely requested that the Department extend the period for challenging certain permit conditions. By order dated May 4, 1990, the Department extended the deadline to June 4, 1990.

I am writing on behalf of Tarmac to request an extension of fifteen (15) days, to and including June 19, 1990, in which to file a petition for administrative proceedings regarding the conditions set forth in the Notice of Intent to Issue Permit. This request is made pursuant to Florida Administrative Code Rule 17-103.070, which provides that a timely request for extension of time shall toll the running of the time period in which to file an appropriate petition. As good cause for granting the requested extension of time for filing, Tarmac shows the following:

1. Tarmac has conferred on several occasions with Department officials in an attempt to resolve the outstanding areas of disagreement.

2. The most recent meeting occurred on May 22, 1990. The District officials stated that they would take Tarmac's comments under advisement and respond in early June.

3. This request is filed as a protective measure to avoid waiver of Tarmac's right to challenge conditions contained in the Notice of Intent to Issue Permit. Granting this request will facilitate the possibility of an acceptable resolution of this matter without the mutual inconvenience of administrative proceedings.

4. I hereby certify that I have spoken with David Schwartz, Assistant General Counsel for the Department, and that he informed me he has no objection to this request.

Accordingly, I respectfully request that you extend the time, to and including June 19, 1990, for filing a petition for administrative proceedings in regard to the Department's Notice of Intent to Issue Permit.

Sincerely,

James S. Alves

TarmacExt:gbb

United States Department of the Interior

National Park Service
SOUTHEAST REGIONAL OFFICE
75 Spring Street, S. W.
Atlanta, Georgia, 30303

TAKE PRIDE IN AMERICA

RECEIVED
JUN 05
DER - BAQM

IN REPLY REFER TO:

N3615 (475)

MAY 30 1990

Mr. Bill Thomas
Bureau of Air Regulation
Florida Department of Environmental Regulation
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Dear Mr. Thomas:

Thank you for sending us a copy of Tarmac Florida Inc.'s (Tarmac) permit application and your technical review document regarding Tarmac's proposal to modify its cement manufacturing facility in Medley, Dade County, Florida. The Tarmac facility is located approximately 30 km northeast of Everglades National Park (EVER), a class I air quality area administered by the National Park Service. We appreciate your continued cooperation in notifying us of proposed projects that may impact the air quality and related resources of our areas.

Tarmac proposes to convert kiln No. 2 from gas/oil firing to coal firing. The proposed project would result in significant increases in emissions of sulfur dioxide (SO_2), nitrogen oxides (NO_x), sulfuric acid mist (H_2SO_4), lead (Pb), and beryllium (Be). Consequently, PSD review is required for these five pollutants. Our comments on the best available control technology (BACT), air quality, and air quality related values (AQRVs) analyses with respect to the proposed project's potential impacts on EVER are discussed below. We ask that you consider our comments before you make a final determination on the proposed project.

We agree with Tarmac that the existing electrostatic precipitator represents BACT to minimize emissions of Pb and Be. For SO_2 and NO_x, we do not agree that the rates proposed by Tarmac represent BACT. Tarmac has proposed a SO_2 rate of 400 lb/hr (16 lb/ton of clinker produced). This rate is based on a 36 percent inherent removal efficiency associated with the limestone feed into the kiln and the particulate control device. As you point out in your BACT analysis, past BACT determinations for coal fired kilns have ranged from a low of

UNITED STATES
DEPARTMENT OF THE INTERIOR
NATIONAL PARK SERVICE
SOUTHEAST REGION
75 SPRING STREET, S.W.
ATLANTA, GEORGIA 30303

OFFICIAL BUSINESS
PENALTY FOR PRIVATE USE, $300

ATLANTA, GA 303
PM
2 JUN
1990

Mr. Bill Thomas
Bureau of Air Regulation
Florida Dept. of Environmental Regulation
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, FL 32399-2400

20 percent to a high of 90 percent. However, the 20 percent determination was made in 1981 and is not representative of today's "top down" BACT policy.

Tarmac's major argument in support of the proposed 400 lb/hr rate is its willingness to lower the allowable limit if performance test data support a lower level. Such an approach to setting an emission limit does not meet the intent of the BACT analysis. A BACT analysis is a preconstruction review and should be based on the best data available at the time of the review. It should not reflect an arbitrarily high emission limit with the promise to revise the limit downward if future test data so indicate.

Tarmac indicated that testing on kiln No. 3 shows that the inherent SO_2 removal efficiency for this kiln averages 75 percent. Although kiln No. 3 is larger than Kiln No. 2, both kilns are processing the same limestone feed. Therefore, we would expect the inherent SO_2 removal efficiencies of the two kilns to be somewhat similar. Also, for kiln No. 3, the SO_2 absorption efficiency decreased by 24 percent when coal was fired instead of residual oil. When firing residual oil in kiln No. 2, the SO_2 removal efficiency was 91.3 percent. We agree that it is reasonable to assume that the differential efficiency decrease for firing coal instead of oil should be similar for both kilns. Therefore, we agree that a SO_2 removal efficiency of 69.4 percent and a resulting SO_2 limit of 195 lbs/hr represent BACT for the proposed project.

Similarly for NO_x, Tarmac's proposed rate (4.2 lb/ton feed) is higher than past BACT determinations (1.6 - 2.9 lb/ton). We agree with you that a NO_x emission rate of 2.84 lb/ton better reflects BACT for the proposed project.

Tarmac used the ISCST dispersion model to predict potential SO_2 and NO_2 impacts at EVER. Surface and upper air meteorological data (1982-1986) from Miami and West Palm Beach, Florida, respectively, were deemed to be representative of the project area and were used as input to the model. Tarmac's air quality analysis shows that the expected SO_2 impacts at EVER would be 18.5, 4.7, and 0.6 ug/m^3 for the 3-hour, 24-hour, and annual averaging times, respectively. This represents a 74, 94, and 30 percent consumption of the allowable SO_2 class I increment for the respective averaging times. The maximum NO_2 class I impact was predicted to be 0.02 ug/m^3 (annual average).

Although the impacts at EVER would be considerably less if the lower emissions proposed by your office were modeled, Tarmac's air quality analysis appears to be incomplete with respect to the emissions inventory used to predict PSD increment consumption. Tarmac indicates in its permit application that the maximum increment consumption values are due to the effects of two increment consuming sources located in Dade County: Tarmac Florida (cement plant) and Dade County Resource Recovery

(MSW incinerator). If the emissions inventory included only these two sources in Dade County, then it may be inadequate because it is possible that other increment consuming sources located outside of Dade County may impact EVER.

An emissions inventory used to assess potential impacts on a class I area should consist of all increment consuming emissions within the impact area of the proposed source and those outside the impact area that are within 50 km and/or between the proposed source and the class I area. We ask that you carefully scrutinize Tarmac's emissions inventory and ensure that all appropriate increment consuming sources are modeled.

A cumulative impact analysis should also be made of all permitted and existing sources within 50 km of the facility's impact area, along with any sources between the proposed source and the park, that could potentially impact the class I area (this is especially important for annual impact determinations). This, along with representative ambient air monitoring data, will yield a more accurate assessment of potential <u>total</u> cumulative impacts in EVER.

Tarmac performed a Level-1 visibility screening analysis based on the new visibility screening analysis model-- VISCREEN -- described in the Environmental Protection Agency's <u>Workbook for Plume Visual Impact Screening and Analysis</u> (September 1988). The results of this analysis show that the proposed project passes the Level-1 screening test. Therefore, it is unlikely that the proposed emissions would cause plume impacts in EVER. Nevertheless, the potential of the source to contribute to the regional haze visibility problem in EVER still exists. Regional haze is a problem that impairs visibility in the park and the surrounding region. Visibility in the eastern U.S. has degraded steadily since the early 1950's, with the most dramatic changes occurring in the spring and summer months (Husar et al., 1981). In many areas in the East, sulfates are responsible for much of the haze (e.g., recent studies carried out at Shenandoah National Park have shown that sulfates are responsible for nearly 70 percent of reduced visibility, while organics contribute up to 30 percent of the problem (Malm et al., 1987)).

Within 100 km of an urban center, a powerplant, or other industrial facilities, haze is generally a mixture of gases and secondary aerosols. Gaseous "precursor" emissions from a source are converted through very complex reactions into secondary aerosols. Sulfur oxides convert into sulfuric acid and ammonium sulfate, nitrogen oxides convert to nitric acid and ammonium nitrate, and hydrocarbons become organic aerosols (Malm et al., 1989). In most cases, we do not yet have the data and analytical techniques needed to estimate the contribution of an individual source to regional haze. However, monitoring and modeling studies that are being conducted presently may provide a means of assessing the contribution of individual sources to regional haze. In the meantime, we encourage the Florida DER to take all steps possible to reach national and State visibility goals by limiting pollutants, such as SO_2, NO_2 and VOCs that contribute to visibility degradation not only in class I areas but in the whole region.

In summary, we agree that the SO_2 and NO_x emission rates proposed in your draft permit reflect BACT. Also, because Tarmac's air quality analysis shows that the allowable class I SO_2 increment (24-hr average) will be virtually consumed, and since there is some question as to the completeness of the emissions inventory used in the analysis, we ask that you carefully scrutinize Tarmac's emissions inventory and ensure that all appropriate increment consuming sources are modeled.

If you have any questions regarding the above comments, please contact John Bunyak of our Air Quality Division in Denver at (303) 969-2071.

Sincerely,

FOR Robert M. Baker
Regional Director
Southeast Region

cc: J. Reynolds
B. Andrews
M. Finn
S. Brooks, SE Dist.
P. Wong, DERM
B. Miller, EPA

RECEIVED Tarmac

MAY 29 1990

DER - BAQM

TARMAC FLORIDA, INC.
P.O. Box 2998
Hialeah, Florida 33012

May 23, 1990

Mr. C.H. Fancy, P.E., Chief
Bureau of Air Regulation
Florida Department of Environmental
Regulation
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

RE: Proposed Modification - Kiln 2 Coal Conversion
DER File No. AC13-169901; PSD-FL-142

Dear Mr. Fancy:

I would like to thank you and your staff for taking the time out of your busy schedules to meet with us once again. Today I met with our cement production staff one more time to see if anything further could be done to reduce the SO_2 emission limit requested in the referenced application. After much sole searching and discussions Tarmac feels that an initial permitted SO_2 limit of 321 lb/hr would be feasible. We would propose the same testing program which E.P.A. has accepted and adjust the emissions limits accordingly. This change is based on the following assumptions:

Original Application:

1 - The sulfur content of the coal is 2% sulfur with a maximum heat input per ton of clinker of 6.5 MMBTU. This gives potential SO_2 emissions from the fuel of 520 lb/hr.

(13000 lb/hr coal) x (2% S content) x (32/16 S to SO_2 conversion) = 520 lb/hr

2 - The raw kiln feed has a sulfate content as SO_3 of 0.16%. With a feed rate of 81000 lb/hr on a dry basis this gives potential SO_2 emissions from the feed of 103.7 lb/hr.

(81000 lb/hr feed) x (0.16% SO_3 content) x (64/80 SO_3 to SO_2 conversion) = 103.7 lb/hr

3 - The absorption of SO_2 in the kiln is projected to be 36 per cent. Based on this absorption the SO_2 emission rate as stated in the application is 400 lb/hr.

(520 lb/hr from coal) + (103.7 lb/hr from feed) = 623.7 lb/hr potential
(623.7 lb/hr potential) - (36% absorption) = 399.2 lb/hr SO_2 emissions

Proposed SO_2 Limit Revision:

1 - In our agreement with EPA the sulfur content would be a rolling average of 1.75% with a maximum of 2.0%. This reduces the potential SO_2 emissions from the fuel to 455 lb/hr.

(13000 lb/hr coal) x (1.75% S content) x (32/16 S to SO_2 conversion) = 455 lb/hr

2 - The cement production staff have come up with a method of reducing our energy requirements (i.e. heat input). This would be accomplished by redesigning the chain system in the kiln to recover more heat and in such a way as to not cause any air flow problems or back drafts in the kiln. They feel that with this redesign that the maximum heat input requirement per ton of clinker could then be reduced to 6.0 MMBTU. This would reduce the coal input by 1000 lb/hr which would reduce the potential SO_2 emissions into the kiln by 35 lb/hr.

(1000 lb/hr coal) x (1.75% S coal) x (32/16 S to SO_2 conversion) = <35 lb/hr>

3 - One final fine tuning of our projected SO_2 emissions is to use an average sulfate content of our raw kiln feed over the last five years instead of the highest sulfate content as used in the original application. The average raw kiln feed sulfate content as SO_3 for the past five years is 0.126% versus 0.16% in the original application. With a feed rate of 81000 lb/hr on a dry basis this gives potential SO_2 emissions from the feed of 81.6 lb/hr.

(81000 lb/hr feed) x (0.126% SO_3 content) x (64/80 SO_3 to SO_2 conversion) = 81.6 lb/hr

4 - Applying these factors and utilizing the projected SO_2 absorption in the kiln of 36%, the revised SO_2 emission rate is 321 lb/hr.

(455 lb/hr from coal) - (35 lb/hr reduced heat input) + (81.6 lb/hr from feed) = 501.6 lb/hr
(501.6 lb/hr potential) - (36% absorption) = 321.0 lb/hr SO_2 emissions

I am hopeful this revised <u>starting point</u>, or initial 321.0 lb/hr limit for SO_2 emissions along with the 169.3 lb/hr limit for NO_x will be acceptable in conjunction with Tarmac's proposal to conduct a 1-year testing program. The testing program will allow adequate data to be collected upon which a true BACT limit can then be established.

I again thank you and your staff for your time on this matter and entreat your consideration and balanced decision. Should you have any questions or request further information please do not hesitate to call me at (305)823-8800.

Sincerely,

Albert W. Townsend

Albert W. Townsend
Manager, Real Estate & Environmental

cc: D. Buff
D. Bailey
S. Quaas
J. Alves
J. Reynolds
B. Andrews
M. Tinn
S. Brooks, SE Dist.
P. Wong, DERM
B. Miller, EPA
M. Flores, NPS

BEST AVAILABLE COPY

Tarmac

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MAY 29 1990

~~DER-BAQM~~

TARMAC FLORIDA, INC.

May 24, 1990

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FACSIMILE

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Tarmac Florida, Inc.
REAL ESTATE/ENVIRONMENTAL/ENGINEERING
P.O. Box 2998
Hialeah, Florida 33012

RECEIVED

MAY 29 1990

DER-BAQM

FROM: Scott Quaas

Telephone No: (305)823-8800
Facsimile No: (305)822-0607

****

TO: Clair Fancy -- FDER, Bureau of Air Regulation

Facsimile No: (904)487-4938

Number of pages including cover sheet 4

Comments: Attached is a letter mailed yesterday which proposes a lower SO_2 emission limit.

METROPOLITAN DADE COUNTY, FLORIDA

METRO-DADE

METRO-DADE CENTER

ENVIRONMENTAL RESOURCES MANAGEMENT
SUITE 1310
111 N.W. 1st STREET
MIAMI, FLORIDA 33128-1971
(305) 375-3376

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MAY 11 1990

DER - BAQM

April 30, 1990

C.H. Fancy, P.E.
Bureau of Air Regulations
Florida Department of Environmental Regulation
2600 Blair Stone Road
Tallahassee, Florida 32399

RE: Tarmac Florida, Inc., Kiln 2 Coal Conversion AC-13-169901; PSD-FL-142

Dear Mr. Fancy:

DERM has reviewed Tarmac's comments to the Best Available Control Technology Determination for the subject application issued by FDER. On April 26, 1990 Barry Andrews, FDER and Ewart Anderson of our staff discussed Tarmac's rebuttal points contained in their comments and was in general agreement with the significant positions outlined in the determination.

Our primary areas of disagreement with the applicant's arguments are as follows:

1. Tarmac has not provided documentation to demonstrate that Kilns 2 and 3 are different from each other, nor have their arguments substantiated this assertion. Tarmac is now challenging the FDER position that Kiln 2 can achieve a 69 percent SO_2 reduction efficiency when burning coal, however this was a basic ingredient in the Kiln 3 permit review when that unit was converted to coal fuel.

2. In order to support their claim that the most stringent alternative(s) pursuant to Top-Down Best Available Control Technology is unreasonable and can therefore be set aside, Tarmac must provide a detailed analysis, economic or otherwise, to establish a basis for DER's reversal of its current determination.

3. Finally, the proposal by Tarmac to conduct a 1-year testing program to collect data in order to determine the BACT limit is inconsistent with the BACT process. We feel that Kiln 3's performance can in fact be used as the basis for this determination. EPA, FDER and other authorized agencies are empowered to make educated appraisals and determinations of BACT.

With regard to the BACT determination for Nitrogen Oxides, DERM fully agrees with the determination of the FDER and the emission levels established.

If you should have further questions regarding the information provided in this letter, please call Mr. Ewart Anderson or myself of the Air Section at (305) 858-0601.

Sincerely,

H. Patrick Wong

H. Patrick Wong
Chief, Air Section
Environmental Monitoring Division

cc: J. Reynolds
D. Lenn
B. Andrews
S. Brooks, SE Dist
CHF

ELA/aas

6. Competition for PSD Class I increments may exist in the future due to new cogenerators locating in the area. An arbitrarily low emission limit for Tarmac, coupled with other new plants in the area, might preclude Tarmac from raising their emission limits in the future due to limited PSD increment availability.

As we understand it, your staff will be reviewing the new information we submitted within the next three weeks, and any decision to revise the draft BACT will be made within 30 days of our meeting. Please call if you have any questions on this matter.

Sincerely,

David A. Buff

David A. Buff, M.E., P.E.
Principal Engineer

DAB/dpy

cc: Bruce Miller, EPA
Al Townsend, Tarmac Florida
Barry Andrews, FDER
J. Reynolds
M. Fennis
I. Goldman, SE Dist.
P. Wong, DERM
C. Shaver, NPS
CHF/BKP

Tarmac

TARMAC FLORIDA, INC.

P.O. Box 2998
Hialeah, Florida 33012

VIA HAND DELIVERY

April 16, 1990

Mr. David Schwartz
Office of General Counsel
Florida Department of
Environmental Regulation
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

RE: Kiln No. 2 Coal Conversion
DER File No. AC 13-169901
PSD-FL-142

Dear Mr. Schwartz:

Tarmac received the *Notice Of Intent To Issue Permit* for the above referenced facility on April 4, 1990. Tarmac must take exception to Specific Condition 3., 4., and 5. and requests the fourteen (14) day time limit for filing a petition for an administrative determination (hearing) under Section 120.57, Florida Statutes be waived for an additional thirty (30) days.

The singular concern of Tarmac is that the SO_2 and NO_x emission limits proposed by the Department are not achievable in Kiln No. 2. The proposed emission limits are from the BACT analysis contained in the *Technical Evaluation and Preliminary Determination* for the referenced facility. There are site-specific technical considerations which render the proposed emission rates as not achievable and economic considerations preclude the use of a different type of kiln or different process. The additional time will allow Tarmac to discuss with the Department the site-specific aspects and data for this project along with the BACT determination procedure.

I look forward to providing any additional information you or the Department may need to reach a resolve to this matter. Should you have any questions please call me at (305)823-8800.

Sincerely,

Scott Quaas
Environmental Specialist

cc: C. Fancy - FDER, Tallahassee

KBN

April 19, 1990

RECEIVED
APR 24 1990
DER

Mr. C.H. Fancy, P.E.
Bureau of Air Regulation
Florida Department of Environmental Regulation
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Re: Proposed Modification--Kiln No. 2 Coal Conversion
PSD-FL-142--AC13-169901

Dear Mr. Fancy:

This correspondence is to summarize the outcome of our meeting on April 17, at your offices in Tallahassee, to discuss the above referenced permit application. The discussion centered on FDER's BACT determination, as set forth in the draft permit, and the proposed SO_2/NO_x emission limits for Kiln 2. Tarmac's major concerns, as expressed to you in the meeting, are as follows:

1. Dry process cement kilns cannot be compared with wet process cement kilns, such as Tarmac's;

2. NSPS for fossil fuel steam generators are not appropriate for comparison to portland cement plants because of the very different nature of the cement manufacturing process;

3. FDER must properly consider site-specific factors in their BACT determination- wet process plant, kiln size and capacity, raw feed sulfur content, coal sulfur content, existing precipitator for particulate control, and proper interpretation of historic test data from the kilns at the plant;

4. Past BACT determinations and test data from other wet process kilns (which is very limited) cannot be directly applied to Tarmac Kiln 2, because of the site-specific nature of SO_2/NO_x emissions from cement kilns;

5. EPA Region IV has approved in writing Tarmac's plan for a 1-year testing period to determine an acceptable BACT emission limit, with the applicant's proposed emission limits as the starting point for this determination; and

KBN ENGINEERING AND APPLIED SCIENCES, INC.
1034 Northwest 57th Street Gainesville, Florida 32605 904/331-9000 FAX: 904/332-4189

BEST AVAILABLE COPY

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GAINESVILLE FL APR-20

MR C H FANCY
BUREAU OF AIR REGULATION
FLORIDA DEPARTMENT OF ENVIRONMENTAL
REGULATION
2600 BLAIR STONE ROAD
TALLAHASSEE FL 32399-2400

KBN ENGINEERING AND APPLIED SCIENCES, INC.
1034 Northwest 57th Street Gainesville, Florida 32605

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IV
345 COURTLAND STREET
ATLANTA, GEORGIA 30365

4APT/AEB

APR 13 1990

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APR 17 1990
DER - BAQM

Mr. Clair H. Fancy, P.E., Chief
Bureau of Air Regulation
Florida Department of Environmental
Regulation
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

RE: Tarmac Florida, Inc. (PSD-FL-142)
Kiln No. 2 Coal Conversion

Dear Mr. Fancy:

We have received a copy of your March 29, 1990, prevention of significant deterioration (PSD) Technical Evaluation and Preliminary Determination for the above referenced project. As discussed between Mr. John Reynolds of your staff and Mark Armentrout of my staff on April 4, 1990, we are offering the following comments.

The draft permit does not address PM_{10} emissions. We suggest that the final permit contain a PM_{10} emission limit for the kiln and a test method for determining compliance.

The draft permit does not include any specific provisions regarding the control of fugitive emissions from the coal handling operations and haul roads. Tarmac was able to avoid applicability to the PSD regulations for particulate matter based on certain assumptions for controlling these fugitives. Therefore, these assumptions must be reflected in the final permit.

The final permit needs to contain an emission limit and test method for determining carbon monoxide emissions from the kiln.

Thank you for the opportunity to review this PSD package. If you have any questions concerning this letter, please contact Mark Armentrout of my staff at (404) 347-2904.

Sincerely yours,

Jewell A. Harper, Chief
Air Enforcement Branch
Air, Pesticides and Toxics
Management Division

cc: Mr. David Buff, KBN
Mr. Scott Quaas, Tarmac Florida
J. Reynolds
B. Andrews
M. Linn
J. Goldman, SE Dist
P. Horg, DER AM
CHF/JRP

RECEIVED
APR 13 1990
DER - BAQM

April 12, 1990

Mr. C.H. Fancy, P.E.
Bureau of Air Regulation
Florida Department of Environmental Regulation
2600 Blair Stone Road
Tallahassee, FL 32399-2400

Re: Tarmac Florida, Inc., Kiln 2 Coal Conversion AC13-169901; PSD-FL-142

Dear Mr. Fancy:

Attach are comments to the Technical Evaluation and Preliminary Determination for the above-referenced application. These comments are submitted on behalf of Tarmac Florida in response to the published Public Notice. I look forward to meeting with you and your staff on April 17 to discuss these comments and our concerns.

Sincerely,

David A Buff/lcb

David A. Buff M.E., P.E.
Principal Engineer

DAB/mah

Attachments

cc: Al Townsend, Tarmac
Bruce Miller, EPA
Patrick Wong, DERM
Steve Smallwood, FDER
Barry Andrews, FDER

89025A1/3

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1034 Northwest 57th Street Gainesville, Florida 32605 904/331-9000 FAX: 904/332-4189

TECHNICAL COMMENTS TO THE BEST AVAILABLE CONTROL TECHNOLOGY DETERMINATION TARMAC FLORIDA, INC. AC13-169901

The Florida Department of Environmental Regulation (FDER) has issued the Technical Evaluation and Preliminary Determination and proposed Prevention of Significant Deterioration (PSD) permit for the conversion of Kiln 2 at Tarmac Florida to coal firing. The FDER's Best Available Control Technology (BACT) Determination is also contained in the preliminary determination.

Provided herein are technical comments and additional information on the preliminary BACT determination. This response is organized according to the BACT determination issued by FDER.

BACT DETERMINATION REQUESTED BY THE APPLICANT

The applicant's proposed BACT emission rate as stated by FDER for nitrogen oxides (NO_x) [8.02 pounds per ton (lb/ton) clinker] is incorrect. The correct figure should be 6.77 lb/ton clinker.

It is also incorrect that Tarmac has proposed an sulfur dioxide (SO_2) emission level of 400 pounds per hour (lb/hr) or 16.0 lb/ton clinker as BACT, as inferred by FDER. Tarmac has clearly stated in the application, as well as in numerous conversations with FDER staff, that the stated emission level will be used only as the starting point in determining what BACT should actually be. A comprehensive testing program has been proposed to determine an appropriate emission level (BACT) for Kiln 2 because no actual operating data for Kiln 2 burning coal is available, Kiln 2 is very different than Kiln 3, and SO_2 emissions from coal-fired kilns are very kiln specific (depends on absorption in kiln, sulfur in raw feed, and operating conditions within the kiln). The results from this testing can be utilized by FDER to set the BACT limit. This BACT strategy was approved by EPA Region IV in January 1990.

BACT DETERMINATION PROCEDURE

This section briefly outlines FDER's and U.S. Environmental Protection Agency's (EPA's) BACT determination procedure and current "top-down" approach. The applicant agrees with this approach, but several areas in FDER's BACT determination are not consistent with these regulations and policies.

EPA has issued draft policy guidance concerning the top-down BACT approach. These are contained in a draft document entitled "Top-Down Best Available Control Technology: A Summary" (May 25, 1989) and an EPA memo containing "Background Statement on the Environmental Protection Agency's Top-Down Policy" (June 13, 1989). The following relevant quotations from these documents are presented:

> In summary, all available control technologies are ranked, and the most stringent alternative is considered initially in the BACT analysis. However, when supported by a complete and objective review, technologies that can be demonstrated to be infeasible, unreasonable, or otherwise not achievable considering source-specific energy, economic, environmental, or technological reasons can be set aside.
>
> The top-down policy does not establish a national BACT standard. The statute provides that technical considerations may, alone or in conjunction with energy, environmental, or economic factors, render a given control technology or associated emission limitation not "achievable" in a given PSD case. It is precisely the purpose of the BACT analysis to weigh these factors in determining whether an "available" technology or emission limit is "achievable" in the given case. Adoption of a top-down methodology does not change or alter this requirement.
>
> Rejection of a control technology by a reviewing agency must have a rationale arrived at after full consideration of data determined in a consistent and sound manner. Such decisions may not be arbitrary, capricious, or contrary to law.

In the BACT determination for Tarmac Florida Kiln 2 coal conversion, FDER has not followed this policy guidance by:

1. Ignoring and improperly interpreting the applicant's site-specific emissions data;

2. Arbitrarily comparing completely different processes and industries to Tarmac's proposed process; and
3. Failing to provide a complete and objective review of available data and ignoring the site-specific factors set forth in the application, resulting in a flawed BACT determination.

Each of these will be discussed in greater detail in the following sections.

BACT ANALYSIS FOR SO_2

FDER presents a summary of previous BACT determinations for coal-fired cement kilns. This summary contains only the least stringent and most stringent percent SO_2 reduction and the lowest and highest emission rate in terms of pounds per million British thermal units (lb/MM Btu) contained in any previous BACT determination. No description of the type of cement kiln (i.e., wet, dry, or preheater/precalciner/kiln system), the sulfur content of the fuel, the clinker production rate, sulfur content of the raw feed, or other site-specific factors that were the basis of the decisions is presented. This analysis does not constitute a complete and objective review, nor does it represent a sound rationale, as required by the BACT guidelines.

A complete listing of all BACT determinations for cement plants, as contained in the BACT Clearinghouse documents, is contained Table 1. The list is arranged chronologically and segregated according to dry and wet process kilns. The list shows that almost all cement plants requiring BACT review were the dry process type.

Review of this information reveals that the 90 percent SO_2 reduction efficiency cited by FDER as the most stringent was based upon the Monolith Cement Co. (California) BACT determination. This is a wet process kiln which burns a coal/coke combination with a maximum of 1.5 percent sulfur. Further investigation of this limit revealed that the applicant actually proposed a range of efficiency of between 50 percent and 90 percent,

Table 1. Summary of BACT Determinations for Portland Cement Kilns – SO2 Emission

Company Name	State	Date of Permit	Source +	Fuel, sulfur content, %	Process	Capacity	Clinker Production	SO2 Emission Limit				Comments
								lb/hr	lb/MMBtu	lb/ton cl.	% Reduction	
					Dry Process Kilns							
Kaiser Cement & Gypsum Corp.	CA	26–Dec–78	PH/PC/Kiln/Mill	Coal, <1%	Dry	1.60 MMTPY	104 TPH	481		4.63		Baghouse alkali dust
Calif. Portland Cement Co.	CA	12–Jan–79	PC/Kiln	Coal	Dry	1 MMTPY	114 TPH	616		5.40	70%	Absorption by alkaline
Lonestar Industries Inc.*	TX	19–Feb–80	PC/Kiln/Mill	Coal	Dry	1 MMTPY	114 TPH	960		8.42	80%	Baghouse alkali dust
Texas LeHigh Cement Co.	TX	16–May–80	PC/Kiln/Mill	Coal	Dry	2,750 TPD	115 TPH	416		3.62	86%	Baghouse alkali dust
Creole Corp.	CA	20–May–80	PC/Kiln/Mill	Coal	Dry	1.10 MMTPY	67 TPH	344		5.13	85%	SO2 limit to be revised
Lonestar Portland Cement *	UT	16–Jan–81	PC/Kiln	Coal, low	Dry	510,000 TPY	71 TPH	64.5		0.91	85%	
Dixie Cement Co. *	TN	10–Sep–81	PH/PC/Kiln	Coal	Dry	800,000 TPY	99 TPH	4.16		0.04	85%	Limestone injection
Southwestern Portland Cement	TX	05–Nov–81	Kiln #3	Coal, mod.	Dry	2,500 TPD	104 TPH	134	0.49	1.30		Low S coal/partial scrubbing
Southwestern Portland Cement	TX	05–Nov–81	Kiln #1	Coal, low	Dry		71 TPH	209	1.12	2.94		No control equipment
Southwestern Portland Cement	TX	05–Nov–81	Kiln #2	Coal	Dry		62 TPH	86	0.52	1.40		Partial liq. scrub.
Lonestar Industries Inc.	WA	25–Jan–82	PC/Kiln/Mill	Coal	Dry	750,000 TPY	100 TPH	275		2.75		Precalciner/baghouse
Las Vegas Portland Cement *	NV	01–Feb–82	Kiln	Coal, <.9%	Dry	6,000 TPD	125 TPH	260		2.08	80%	2hr ave., low S coal
Florida Crushed Stone	FL	27–Mar–84	PH/PC/Kiln	Coal, <.8%	Dry	600,000 TPY	124 TPH	74		0.60		Integrated power plant
Nevada Cement Co. *	NV	05–Mar–85	PH/PC/Kiln	Coal	Dry		42 TPH	16		0.38	90%	Multistage susp. preheater
Lone Star Industries	CA	29–Jul–86	PH/PC/Kiln	Coal	Dry		100 TPH	250		2.50		40–50% SO2 control expected
Florida Mining & Material	FL	26–Dec–88	PH/Kiln/Mill	Coal, <1%	Dry		73.5 TPH	20		0.28	96%	<1 Wt.%S coal, design
					Wet Process Kilns							
Southwestern Portland Cement	TX	26–Feb–81	Rotary Kiln	Coal	Wet	775 TPD	32 TPH	513	2.41	16.00	20%	Alkali in raw matl. rx w/ S
Monolith Portland Cement Co.	CA	23–Dec–81	Rotary Kiln	Coal, <1.5%	Wet	500,000 TPY	62 TPH	300		4.48	50 to 75%	Baghouse alkali cement dust
Lonestar Florida Pennsuco	FL	28–Dec–84	Kiln #3	Coal, <2%	Wet		87.5 TPH	400		4.60		<2 Wt.% S coal (max. value)
Lonestar Florida Pennsuco*	FL	28–Dec–84	Kiln #2	Coal, <2%	Wet		25 TPH	125		5.00		<2 Wt.% S coal (max. value)
Lonestar Florida Pennsuco*	FL	28–Dec–84	Kiln #1	Coal, <2%	Wet		25 TPH	125		5.00		<2 Wt.% S coal (max. value)

* Facility was never built

\+ PH = Preheater
PC = Precalciner

because it was not known what the kiln would actually achieve. EPA's BACT determination on this project actually states between 50 percent and 75 percent removal efficiency is expected (excerpts of the determination are attached). The 50 percent minimum removal efficiency is not very different from the 36 percent stated by Tarmac as the starting point for its BACT determination. More importantly, the 300 lb/hr SO_2 emission limit set for the Monolith kiln was based on actual source test data from an identical kiln located at the facility. Thus, site-specific data were used to set the emission limit for Monolith.

The most stringent BACT limit set in terms of lb/MM Btu heat input, cited by FDER as 0.488 lb/MM Btu, is based upon Southwest Portland Cement (Texas). Further investigation reveals that this is a dry process kiln.

There is a fundamental difference between the dry process and the wet process used at Tarmac. The dry process is more energy efficient than the wet process, therefore requiring less fuel (on the order of 50 percent less fuel). This translates directly into lower SO_2 emissions. In addition, most of the dry process kilns incorporate a preheater or precalciner, and many pass the kiln gases through the raw mill. This translates into significantly more contact time between the raw feed and the SO_2 in the exhaust gases, allowing much better absorption of the SO_2. FDER ignores this fundamental difference between the wet and dry processes, thereby grossly exaggerating the inherent SO_2 removal capabilities of Tarmac Kiln 2.

The fact that Tarmac Kiln 2 is a wet process kiln demonstrates that FDER fails to consider the site-specific considerations of this project. The entire Tarmac facility is an existing cement plant based upon the wet process. Kiln 2 is part of the existing plant, and, therefore, must also utilize the wet process. If Tarmac was building a new kiln, they would undoubtedly build a dry process kiln, because of the energy efficiencies. However, this is not the case, and ignoring this site-specific aspect is contrary to BACT regulations and policy.

If only wet process kilns are considered from previous BACT determinations, only the Monolith and a Southwest Portland Cement BACT's remain (other than BACT's for the Tarmac facility itself). The Southwest determination is for a wet process kiln, and the BACT limit set is identical to Tarmac's proposed limits--16 lb/ton clinker. SO_2 reduction efficiency was estimated at only 20 percent, below the minimum stated by Tarmac for Kiln 2.

There is no discussion in the FDER's BACT determination on the effect of sulfur in the raw feed upon SO_2 emissions. Sulfur in the raw feed can be expected to translate directly into potential SO_2 emissions. Tarmac's raw feed could contain higher sulfur levels than those at other plants having BACT determinations, resulting in higher SO_2 emissions. However, such information is not presented or considered by FDER. Tarmac has shown in its application the maximum expected sulfur content of the raw feed and the potential SO_2 emissions resulting from the raw feed. However, FDER has given no consideration to this site-specific factor in determining the BACT emission limit.

FDER bases their BACT determination, in part, on the contention that Kiln 2 should be able to achieve a 69 percent SO_2 reduction efficiency when burning coal. This conclusion is based on SO_2 emission tests conducted on oil for Kilns 2 and 3 and on coal for Kiln 3. FDER rationale for this conclusion is based on an incorrect calculation that is not supported by the engineering data. One source test on Kiln 3 when burning oil showed a 98.7 percent SO_2 reduction efficiency, and several stack tests showed an average of 75 percent reduction when this kiln was burning coal. Kiln 2 was also tested one time burning oil, and showed a 91.3 percent SO_2 reduction. Based on these data, FDER concludes that Kiln 2 should be able to achieve a 69 percent SO_2 reduction from the following calculation:

$$\frac{98.7 \text{ percent}}{91.3 \text{ percent}} = \frac{75 \text{ percent}}{x} \qquad x = 69 \text{ percent}$$

This is an incorrect calculation and is not based on engineering principles. Emissions are a function not of the efficiency, but one minus the efficiency. When burning oil, Kiln 2 displays SO_2 emissions that are 7.5 times that of Kiln 3 when it is burning oil:

Kiln 2 $\quad 1 - 0.913 = 0.097 = 9.7$ percent of potential SO_2 is emitted

Kiln 3 $\quad 1 - 0.987 = 0.013 = 1.3$ percent of potential SO_2 is emitted

Why then should Kiln 2 not display 7.5 times the SO_2 emissions of Kiln 3 when burning coal? In fact, Tarmac is requesting an initial emission limit for Kiln 2 that is only 3.5 times greater than that for Kiln 3 (on a lb/ton basis). Although it is expected that Kiln 2 will achieve greater than the minimum 36 percent efficiency stated by Tarmac, the 69 percent efficiency stated by FDER to be achievable is not supported by the engineering data.

The 69 percent efficiency for Kiln 2 stated by FDER is virtually the same as the 75 percent efficiency demonstrated by Kiln 3 (31 percent of the potential SO_2 emitted versus 25 percent of the SO_2 emitted). This conclusion ignores the applicant's clear documentation that the shorter length of Kiln 2 versus Kiln 3 and different operating conditions within the kilns could result in a significantly lower SO_2 emission reduction than that achieved by Kiln 3. The 36 percent efficiency stated by Tarmac as a starting point for BACT is a reasonable level given these uncertainties. These are site-specific factors which FDER has failed to adequately weigh in setting their BACT emission limit.

In addition, the SO_2 emission reduction efficiencies for Kilns 2 and 3 when burning oil are based on only one source test on each kiln. This affects the confidence of this rationalization.

In the BACT determination, FDER improperly compares federal New Source Performance Standards (NSPS) for fossil-fuel-fired steam-generating units. These NSPS are for a completely different process and completely different industry, and have no bearing upon SO_2 emissions from cement kilns. SO_2 emissions from fossil-fuel steam-generating units are controlled by add-on control equipment, which can be adjusted to obtain a high SO_2 removal efficiency. In contrast, SO_2 control in a cement kiln is inherent in the process, and the removal efficiency is dependent upon the kiln and its operating parameters. These operating parameters are constrained within certain limits to maintain clinker quality. The 1.2 lb SO_2/MM Btu maximum limit under NSPS can easily be met by fossil fuel steam generators burning the highest sulfur coal because the NSPS also requires 90 percent SO_2 removal efficiency (through the use of add-on scrubbers). As a result, the 1.2 lb/MM Btu limit referenced by FDER does not truly account for the sulfur content of the coal Tarmac will burn. Further, in making this comparison, FDER has ignored the fact that the raw feed to the kiln contains sulfur, and this sulfur is a potential source of SO_2 emissions, just like the sulfur in the coal. Again, site-specific factors have not been recognized.

FDER has also not recognized the potential relationship between SO_2 and NO_x emissions in setting the BACT limit for SO_2. Extensive testing and operation on Kiln 3 has shown there is a distinct inverse relationship between these two pollutants. However, FDER has set a much lower NO_x limit for Kiln 2 than the emission limit for Kiln 3, and the engineering data indicate that in order to meet such a limit, SO_2 emissions from Kiln 2 will increase. FDER's BACT determination is flawed further by ignoring this site-specific data and by basing their BACT limit on totally different dry process kilns, located at other sites.

Lastly, FDER has completely ignored Tarmac's proposal to conduct a 1-year testing program to collect adequate data upon which a true BACT limit can be established. The 400 lb/hr (16 lb/ton) limit and 36 percent removal efficiency proposed by Tarmac is not suggested to be BACT for Kiln 2. This has been made very clear by Tarmac. It is only proposed as a <u>starting point</u>, or an initial limit, pending the results of the test program. The following are the primary reasons for this proposal:

1. Experience with the conversion of Kiln 3 to coal has shown that the SO_2 emissions and removal efficiency are dependent upon the kiln and its operation, and that generally NO_x emissions increase as SO_2 emissions decrease. These emissions and their relationship

to operating parameters can be determined only through testing, unless an identical kiln at the same plant has already been tested.

2. Kiln 2 is much shorter than Kiln 3, and, therefore, the expected SO_2 removal efficiency for Kiln 2 is expected to be less. However, the efficiency achievable is not known and can only be determined through source testing on Kiln 2.
3. The initial BACT limits for Kiln 3 were set without adequate test data, and this led to exceedances of the emission limits and enforcement action by FDER. Tarmac does not wish to repeat this situation.

<u>BACT ANALYSIS FOR NITROGEN OXIDES</u>

As for SO_2, FDER presents a summary of previous NO_x BACT determinations for coal-fired cement kilns. This summary contains only the least stringent and most stringent emission rates in terms of lb/ton feed and lb/MM Btu contained in any previous BACT determination. No description of the type of cement kiln (i.e., wet, dry, or preheater/precalciner/kiln system), the clinker production rate, or other site-specific factors that were the basis of the decisions is presented. This analysis incorrectly compares dry process cement kilns to Tarmac's wet process kiln and does not consider site-specific data and factors related to Kiln 2.

A complete listing of all NO_x BACT determinations for cement plants is contained Table 2. The list shows that almost all cement plants requiring BACT review were of the dry process type. There are fundamental differences between the dry process and the wet process in regards to NO_x emissions. The dry process is more energy efficient than the wet process, therefore requiring less fuel (on the order of 50 percent less fuel). This translates into lower fuel-bound nitrogen for dry kilns and, hence, lower NO_x emissions. Secondly, dry process kilns with preheaters and/or precalciners have two or more points in the kiln system where energy is released, as opposed to only one release point in a wet process kiln. As a

Table 2. Summary of BACT Determinations for Portland Cement Kilns – NOx Emission

Company Name	State	Date of Permit	Source +	Fuel, sulfur content, %	Process	Capacity	Clinker Production	NOx Emission Limit lb/hr	NOx Emission Limit lb/MMBtu	NOx Emission Limit lb/ton cl.	Comments
					Dry Process Kilns						
Kaiser Cement & Gypsum Corp.	CA	26–Dec–78	PH/PC/Kiln/Mill	Coal, <1%	Dry	1.60 MMTPY	104 TPH	1158		11.13	Reduced fuel usage, low temp.
Calif. Portland Cement Co.	CA	12–Jan–79	PC/Kiln	Coal	Dry	1 MMTPY	114 TPH	None		None	Reduced fuel usage, low furnace temp.
Lonestar Industries Inc.*	TX	19–Feb–80	PH/Kiln/Mill	Coal	Dry	1 MMTPY	114 TPH	360		3.16	Precalciner process design
Texas Lehigh Cement Co.	TX	16–May–80	PC/Kiln/Mill	Coal	Dry	2,750 TPD	115 TPH	240		2.09	Flash calciner
Creole Corp.	CA	20–May–80	PC/Kiln/Mill	Coal	Dry	1.10 MMTPY	67 TPH	213		3.18	Reduced temp. in precalcining furnace
Lonestar Portland Cement *	UT	16–Jan–81	PC/Kiln	Coal, low	Dry	510,000 TPY	71 TPH	236.6		3.33	
Dixie Cement Co. *	TN	10–Sep–81	PH/PC/Kiln	Coal	Dry	800,000 TPY	99 TPH	110		1.11	Dry process
Southwestern Portland Cement	TX	05–Nov–81	Kiln #3	Coal, mod.	Dry	2,500 TPD	104 TPH	88	0.32	0.85	Kiln design
Lonestar Industries Inc.	WA	25–Jan–82	PC/Kiln/Mill	Coal	Dry	750,000 TPY	100 TPH	300		3.00	Process design
Las Vegas Portland Cement *	NV	01–Feb–82	Kiln	Coal, <.9%	Dry	6,000 TPD	125 TPH	281		3.95	
Florida Crushed Stone	FL	27–Mar–84	PH/PC/Kiln	Coal, <.8%	Dry	600,000 TPY	124 TPH	360		2.90	Dry feed, design
Lone Star Industries	CA	29–Jul–86	PH/PC/Kiln	Coal	Dry		100 TPH	250		2.50	Alkali slurry, injection system
Florida Mining & Material	FL	26–Dec–88	PH/Kiln/Mill	Coal, <1%	Dry		73.5 TPH	320		4.35	
					Wet Process Kiln						
Monolith Portland Cement Co.	CA	23–Dec–81	Rotary Kiln	Coal, <1.5%	Wet	5 MTPY	67 TPH	260		3.88	Coal–fired, wet process

* Facility was never built

+ PH = Preheater
PC = Precalciner

result, the combustion flame in the wet process kiln is more intense than the flames in the dry process kiln. The more intense wet process flame inherently produces higher NO_x emissions. FDER ignores this fundamental difference between the wet and dry processes, thereby flawing the BACT determination.

As in the case of SO_2, FDER improperly compares federal NSPS for fossil-fuel-fired steam-generating units to cement kiln emission limits. These NSPS are for a completely different process and completely different industry, and have no bearing upon NO_x emissions from cement kilns. A major difference between steam generators and cement kilns is that high temperature can be controlled much more effectively, since this does not adversely affect steam generation. However, in a wet process cement kiln, high temperature is critical to the final product. Even so, in making this comparison, FDER fails to recognize that the NSPS specifically sets different emission limits for different types of steam-generating units (i.e., pulverized coal, spreader stoker, fluidized bed). FDER does not differentiate between wet and dry process kilns, or other differences between fossil fuel steam generators and cement kilns which should be considered in their BACT evaluation.

FDER has totally ignored the site-specific test data available from Kiln 3 for coal burning. Tarmac has requested an NO_x emission limit for Kiln 2 that is the same as the limit on Kiln 3 (6.77 lb/ton clinker). Extensive source testing on Kiln 3 when burning coal has shown that this emission level has been exceeded or approached in the past. A summary of all previous NO_x emission tests on Kiln 3 when burning coal is presented in Table 3. The averages of all of these tests are 4.2 lb/ton feed and 6.4 lb/ton clinker, with maximums up to 6.4 lb/ton feed and 10.0 lb/ton clinker. Why does FDER believe that a much lower NO_x emission level can be achieved in Kiln 2? The proposed BACT emission limit is not supported by the site-specific data.

Table 3. NOx Emission Tests, Tarmac Kiln No. 3 Burning Coal

Test Date	Kiln Feed (TPH)	Production Rate (TPH)	Coal Feed Rate (TPH)	Heat Input * Rate (MMBtu/hr)	Heat/Clinker Ratio (MMBtu/ton)	NOx Emission lb/hr	NOx Emission lb/ton feed	NOx Emission lb/ton clinker
Apr–82	138.30	85.6	16.5	412.5	4.82	405	2.9	4.7
	138.30	85.6	16.5	412.5	4.82	512	3.7	6.0
	138.30	85.6	16.5	412.5	4.82	695	5.0	8.1
May–82	127.59	79.0	13.9	347.5	4.40	792	6.2	10.0
	127.59	79.0	13.5	337.5	4.27	520	4.1	6.6
	127.59	79.0	14.4	360.0	4.56	464	3.6	5.9
	127.59	79.0	14.4	360.0	4.56	438	3.4	5.5
	127.59	79.0	14.4	360.0	4.56	218	1.7	2.8
	127.59	79.0	15.5	387.5	4.91	346	2.7	4.4
16–May–85	133.50	87.5	14.9	372.5	4.26	643	4.8	7.3
	132.80	87.5	14.6	365.0	4.17	854	6.4	9.8
	132.70	87.4	14.7	367.5	4.20	750	5.7	8.6
24–May–85	132.80	87.2	14.8	370.0	4.24	732	5.5	8.4
	132.50	87.3	14.5	362.5	4.15	809	6.1	9.3
	132.30	87.7	14.5	362.5	4.13	768	5.8	8.8
31–May–85	132.80	87.6	14.6	365.0	4.17	647	4.9	7.4
	132.80	87.6	14.6	365.0	4.17	618	4.7	7.1
	132.80	87.6	14.6	365.0	4.17	779	5.9	8.9
Aug–85	133.00	86.7	15.2	380.0	4.38	549	4.1	6.3
	133.00	86.7	15.2	380.0	4.38	593	4.5	6.8
	133.00	86.7	15.0	375.0	4.33	602	4.5	6.9
Dec–86	133.50	85.3	16.2	405.0	4.75	678	5.1	7.9
	133.50	85.3	15.9	397.5	4.66	671	5.0	7.9
	133.50	85.3	15.9	397.5	4.66	624	4.7	7.3
Apr–87	133.30	85.9	16.3	407.5	4.74	378	2.8	4.4
	133.30	85.9	15.9	397.5	4.63	438	3.3	5.1
	133.30	85.9	16.0	400.0	4.66	436	3.3	5.1
Dec–87	133.10	87.4	17.5	437.5	5.01	447	3.4	5.1
	133.10	87.4	17.6	440.0	5.03	534	4.0	6.1
	133.10	87.4	17.8	445.0	5.09	532	4.0	6.1
Jul–88	133.50	85.1	18.2	455.0	5.35	484	3.6	5.7
	133.50	85.1	18.1	452.5	5.32	411	3.1	4.8
	133.50	85.1	17.9	447.5	5.26	360	2.7	4.2
Aug–88	132.90	86.4	18.9	472.5	5.47	444	3.3	5.1
	132.90	86.4	18.9	472.5	5.47	488	3.7	5.7
	132.90	86.4	18.7	467.5	5.41	491	3.7	5.7
May–89	133.00	87.5	16.7	417.5	4.77	855	6.4	9.8
	133.00	87.5	16.7	417.5	4.77	717	5.4	8.2
	133.00	87.5	16.7	417.5	4.77	521	3.9	6.0
Aug–89	140.25	92.1	18.3	457.3	4.97	381	2.7	4.1
	140.25	92.1	18.3	457.3	4.97	261	1.9	2.8
	140.25	92.1	18.3	457.3	4.97	333	2.4	3.6
					Maximum =	855	6.4	10.0
					Minimum =	218	1.7	2.8
					Average =	553	4.2	6.4

* Assuming a coal heating value of 12,500 Btu/hr

FDER refers to the most stringent BACT limits for cement kilns of 1.6 lb/ton feed and 0.32 lb/MM Btu. Investigation reveals that these limits were for Lonestar (Utah) and Southwest Portland (Texas), respectively. Both of these determinations were for dry process kilns, which is not the same process as Tarmac's wet process kiln.

FDER has also not recognized the potential relationship between SO_2 and NO_x emissions in setting the BACT limit for NO_x. Extensive testing and operation on Kiln 3 has shown there is a distinct inverse relationship between these two pollutants. However, FDER has set a much lower NO_x limit for Kiln 2 than the BACT limit for Kiln 3; the engineering data indicate that to meet this limit, SO_2 emissions will increase. FDER's BACT determination is further flawed by ignoring this site-specific data.

Lastly, FDER has completely ignored Tarmac's proposal to conduct a 1-year testing program to collect adequate data upon which a true BACT limit can be established. The 169.3 lb/hr (6.77 lb/ton feed) is not suggested to be BACT for Kiln 2. This has been made very clear by Tarmac. It is only proposed as a starting point, or an initial limit, pending the results of the test program. The primary reasons for this were discussed for SO_2.

SUMMARY

To summarize, Tarmac strongly believes that the SO_2 and NO_x emission limits proposed by FDER are not achievable in Kiln 2. There are site-specific technical considerations alone which render the proposed emission rates as not achievable. Economic considerations preclude the use of a different type of kiln or different process. However, FDER has elected to ignore the site-specific aspects and data for this project and has imposed limits for totally different processes and projects. This is contrary to BACT guidelines, which require the BACT analysis to have a rationale arrived at after full consideration of data determined in a sound and consistent manner. Such decisions cannot be arbitrary, capricious, or contrary to law.

For Routing To Other Than The Addressee	
To:	Location:
To:	Location:
To:	Location:
From:	Date:

State of Florida
DEPARTMENT OF ENVIRONMENTAL REGULATION

Interoffice Memorandum

TO: Bill Thomas, P.E., Bureau of Air Regulation

FROM: Stephanie Brooks, P.E., DER-SEFD Stephanie Brooks, P.E.

DATE: April 10, 1990

SUBJECT: Proposed Permit for Tarmac Kiln 2

Specific Condition 3. does not reference Kiln 2 like all other Specific Conditions that are related to emission limitations do. No other comments about this permit from the air section.

RECEIVED
APR 20 1990
DER - BAQM

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

SENDER: Complete items 1 and 2 when additional services are desired, and complete items 3 and 4.
Put your address in the "RETURN TO" Space on the reverse side. Failure to do this will prevent this card from being returned to you. The return receipt fee will provide you the name of the person delivered to and the date of delivery. For additional fees the following services are available. Consult postmaster for fees and check box(es) for additional service(s) requested.

1. ☐ Show to whom delivered, date, and addressee's address. *(Extra charge)*
2. ☐ Restricted Delivery *(Extra charge)*

3. Article Addressed to:	4. Article Number
Scott Quaas Environmental Specialist Tarmac Florida, Inc. P. O. Box 2998 Hialeah, FL 33012	P 052 482 233 Type of Service: ☐ Registered ☐ Insured ☒ Certified ☐ COD ☐ Express Mail ☐ Return Receipt for Merchandise Always obtain signature of addressee or agent and DATE DELIVERED.
5. Signature — Address X	8. Addressee's Address *(ONLY if requested and fee paid)*
6. Signature — Agent X N. Wilson	
7. Date of Delivery	

PS Form **3811**, Mar. 1988 ★ U.S.G.P.O. 1988-212-865 **DOMESTIC RETURN RECEIPT**

P 052 482 233

RECEIPT FOR CERTIFIED MAIL
NO INSURANCE COVERAGE PROVIDED
NOT FOR INTERNATIONAL MAIL
(See Reverse)

Sent to Scott Quaas, Tarmac Florida	
Street and No. P. O. Box 2998	
P.O., State and ZIP Code Hialeah, FL 33012	
Postage	$
Certified Fee	
Special Delivery Fee	
Restricted Delivery Fee	
Return Receipt showing to whom and Date Delivered	
Return Receipt showing to whom, Date, and Address of Delivery	
TOTAL Postage and Fees	$
Postmark or Date Mailed: 3-30-90 Permit: AC 13-169901 PSD-FL-142	

PS Form 3800, June 1985

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

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.

Technical Evaluation
and
Preliminary Determination

Tarmac Florida, Inc.
Medley, Dade County, Florida

Kiln No. 2 Coal Conversion
Permit No. AC 13-169901
PSD-FL-142

Department of Environmental Regulation
Division of Air Resources Management
Bureau of Air Regulation

March 29, 1990

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)	Proposed Allowable Emissions (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

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 SO_2 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 SO_2 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)
NO_2	Annual	0.5	1.0	14.0
SO_2	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 (NO_2 and SO_2)

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 NO_2 PSD Class I increment consumed is 0.02 ug/m3, which is less than one percent of the allowable PSD NO_2 increment of 2.5 ug/m3, annual average.

Modeling results indicate the maximum SO_2 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 NO_2 and SO_2. Therefore, a PSD increment analysis is required to show compliance with the Class II NO_2 and SO_2 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.

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

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.

Al Thomas
3/30/90

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.

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.

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
SO_2	1.20 lb/MMBtu
NOx	0.70 lb/MMBtu
H_2SO_4 Mist	0.036 lb/MMBtu

Details of the Analysis May be Obtained by Contacting:

Barry Andrews, P.E., BACT Coordinator
Department of Environmental Regulation
Bureau of Air Regulation
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Recommended by:

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

______________ 1990
Date

Approved by:

Dale Twachtmann, Secretary
Dept. of Environmental Regulation

______________ 1990
Date

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

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

Permit Number: AC 13-169901
PSD-FL-142
Expiration Date: December 31, 1991
County: Dade
Latitude/Longitude: 25°52'30"N
80°22'30"W
Project: Kiln No. 2 Coal Conversion

This permit is issued under the provisions of Chapter 403, Florida Statutes, and Florida Administrative Code Chapters 17-2 and 17-4. The above named permittee is hereby authorized to perform the work or operate the facility shown on the application and approved drawing(s), plans, and other documents attached hereto or on file with the Department and made a part hereof and specifically described as follows:

For the conversion of kiln No. 2 to coal firing. The project will be located at the permittee's existing facility in Medley, Dade County, Florida. The UTM coordinates are Zone 17, 562.8 km East and 2861.7 km North.

The source shall be constructed in accordance with the permit application, plans, documents, amendments and drawings, except as otherwise noted in the General and Specific Conditions.

Attachments are listed below:

1. Application to construct received September 5, 1989.
2. DER's letter of incompleteness dated October 4, 1989.
3. EPA's letter dated October 18, 1989.
4. KBN's response (to incompleteness letter) dated November 13, 1989.
5. Dade County DERM's letter dated November 17, 1989.
6. EPA's letter dated December 13, 1989.
7. KBN's letter dated December 21, 1989.
8. KBN's letter dated January 15, 1990.
9. KBN's letter dated January 30, 1990.
10. EPA's letter dated March 20, 1990.

GENERAL CONDITIONS:

1. The terms, conditions, requirements, limitations, and restrictions set forth in this permit are "Permit Conditions" and are binding and enforceable pursuant to Sections 403.161, 403.727, or 403.859 through 403.861, Florida Statutes. The permittee is placed on notice that the Department will review this permit periodically and may initiate enforcement action for any violation of these conditions.

2. This permit is valid only for the specific processes and operations applied for and indicated in the approved drawings or exhibits. Any unauthorized deviation from the approved drawings, exhibits, specifications, or conditions of this permit may constitute grounds for revocation and enforcement action by the Department.

3. As provided in Subsections 403.087(6) and 403.722(5), Florida Statutes, the issuance of this permit does not convey any vested rights or any exclusive privileges. Neither does it authorize any injury to public or private property or any invasion of personal rights, nor any infringement of federal, state or local laws or regulations. This permit is not a waiver of or approval of any other Department permit that may be required for other aspects of the total project which are not addressed in the permit.

4. This permit conveys no title to land or water, does not constitute State recognition or acknowledgement of title, and does not constitute authority for the use of submerged lands unless herein provided and the necessary title or leasehold interests have been obtained from the State. Only the Trustees of the Internal Improvement Trust Fund may express State opinion as to title.

5. This permit does not relieve the permittee from liability for harm or injury to human health or welfare, animal, or plant life, or property caused by the construction or operation of this permitted source, or from penalties therefore; nor does it allow the permittee to cause pollution in contravention of Florida Statutes and Department rules, unless specifically authorized by an order from the Department.

PERMITTEE:
Tarmac Florida, Inc.

Permit Number: AC 13-169901
PSD-FL-142
Expiration Date: December 31, 1991

GENERAL CONDITIONS:

6. The permittee shall properly operate and maintain the facility and systems of treatment and control (and related appurtenances) that are installed or used by the permittee to achieve compliance with the conditions of this permit, as required by Department rules. This provision includes the operation of backup or auxiliary facilities or similar systems when necessary to achieve compliance with the conditions of the permit and when required by Department rules.

7. The permittee, by accepting this permit, specifically agrees to allow authorized Department personnel, upon presentation of credentials or other documents as may be required by law and at a reasonable time, access to the premises, where the permitted activity is located or conducted to:

a. Have access to and copy any records that must be kept under the conditions of the permit;

b. Inspect the facility, equipment, practices, or operations regulated or required under this permit; and

c. Sample or monitor any substances or parameters at any location reasonably necessary to assure compliance with this permit or Department rules.

Reasonable time may depend on the nature of the concern being investigated.

8. If, for any reason, the permittee does not comply with or will be unable to comply with any condition or limitation specified in this permit, the permittee shall immediately provide the Department with the following information:

a. a description of and cause of non-compliance; and

b. the period of noncompliance, including dates and times; or, if not corrected, the anticipated time the non-compliance is expected to continue, and steps being taken to reduce, eliminate, and prevent recurrence of the non-compliance.

GENERAL CONDITIONS:

The permittee shall be responsible for any and all damages which may result and may be subject to enforcement action by the Department for penalties or for revocation of this permit.

9. In accepting this permit, the permittee understands and agrees that all records, notes, monitoring data and other information relating to the construction or operation of this permitted source which are submitted to the Department may be used by the Department as evidence in any enforcement case involving the permitted source arising under the Florida Statutes or Department rules, except where such use is proscribed by Sections 403.73 and 403.111, Florida Statutes. Such evidence shall only be used to the extent it is consistent with the Florida Rules of Civil Procedure and appropriate evidentiary rules.

10. The permittee agrees to comply with changes in Department rules and Florida Statutes after a reasonable time for compliance, provided, however, the permittee does not waive any other rights granted by Florida Statutes or Department rules.

11. This permit is transferable only upon Department approval in accordance with Florida Administrative Code Rules 17-4.120 and 17-30.300, F.A.C., as applicable. The permittee shall be liable for any non-compliance of the permitted activity until the transfer is approved by the Department.

12. This permit or a copy thereof shall be kept at the work site of the permitted activity.

13. This permit also constitutes a Determination of Best Available Control Technology (BACT) and Determination of Prevention of Significant Deterioration (PSD).

14. The permittee shall comply with the following:

a. Upon request, the permittee shall furnish all records and plans required under Department rules. During enforcement actions, the retention period for all records will be extended automatically unless otherwise stipulated by the Department.

PERMITTEE:
Tarmac Florida, Inc.

Permit Number: AC 13-169901
PSD-FL-142
Expiration Date: December 31, 1991

GENERAL CONDITIONS:

b. The permittee shall hold at the facility or other location designated by this permit records of all monitoring information (including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation) required by the permit, copies of all reports required by this permit, and records of all data used to complete the application for this permit. These materials shall be retained at least three years from the date of the sample, measurement, report, or application unless otherwise specified by Department rule.

c. Records of monitoring information shall include:

- the date, exact place, and time of sampling or measurements;
- the person responsible for performing the sampling or measurements;
- the dates analyses were performed;
- the person responsible for performing the analyses;
- the analytical techniques or methods used; and
- the results of such analyses.

15. When requested by the Department, the permittee shall within a reasonable time furnish any information required by law which is needed to determine compliance with the permit. If the permittee becomes aware that relevant facts were not submitted or were incorrect in the permit application or in any report to the Department, such facts or information shall be corrected promptly.

SPECIFIC CONDITIONS:

1. The construction and operation of the subject modification of kiln No. 2 shall be in accordance with the capacities and specifications stated in the application.

2. The maximum clinker production rate of kiln No. 2 shall not exceed 25 tons per hour and 197,100 tons per year. Kiln No. 2 shall operate only on coal firing for up to 7,884 hours per year at a maximum firing rate of 162.5 MMBtu per hour. The coal used for firing kiln No. 2 shall have a maximum sulfur content of 2.0 percent by weight, with the rolling 30-day average sulfur content not exceeding 1.75 percent by weight.

PERMITTEE:
Tarmac Florida, Inc.

Permit Number: AC 13-169901
PSD-FL-142
Expiration Date: December 31, 1991

SPECIFIC CONDITIONS:

3. Sulfur dioxide emissions shall not exceed 1.2 lbs/MMBtu heat input from coal combustion, 195.0 lbs/hr, 768.7 tons/yr.

4. Sulfuric acid mist emissions from kiln No. 2 shall not exceed 0.036 lb/MMBtu heat input from coal combustion, 5.86 lbs/hr, 23.06 tons/yr.

5. Nitrogen oxides emissions from kiln No. 2 shall not exceed 0.7 lb/MMBtu heat input from coal combustion, 113.8 lbs/hr, 448.4 tons/yr.

6. VOC emissions from kiln No. 2 shall not exceed 28.8 lbs/hr, 113.5 tons/yr.

7. Particulate matter emissions from kiln No. 2 shall not exceed 14.40 lbs/hr, 56.76 tons/yr.

8. All reasonable precautions that apply under F.A.C. Rule 17-2.610(3) shall be implemented to limit unconfined emissions of particulate matter from any activity associated with this project.

9. Initial and annual compliance tests shall be conducted using the following test methods:

EPA Method 5 for particulate matter
EPA Method 7 for nitrogen oxides
EPA Method 8 for sulfur dioxide and acid mist
EPA Method 25 for VOC

10. The compliance tests shall be conducted within 30 days after operation on coal begins. The Department's Southeast District office and the Dade County Department of Environmental Resources Management (DCDERM) shall be notified in writing 15 days prior to source testing and at least 5 days prior to initial startup. Written reports of the tests shall be submitted to those offices within 45 days of test completion.

11. The permittee, for good cause, may request that this construction permit be extended. Such a request shall be submitted to the Bureau of Air Regulation prior to 60 days before the expiration of the permit (F.A.C. Rule 17-4.090).

PERMITTEE:
Tarmac Florida, Inc.

Permit Number: AC 13-169901
PSD-FL-142
Expiration Date: December 31, 1991

SPECIFIC CONDITIONS:

12. An application for an operation permit must be submitted to the Department's Southeast District office and the DCDERM at least 90 days prior to the expiration date of this construction permit or within 45 days after completion of compliance testing, whichever occurs first. To properly apply for an operation permit, the applicant shall submit the appropriate application form, fee, certification that construction was completed noting any deviations from the conditions in the construction permit, and compliance test reports as required by this permit (F.A.C. Rule 17-4.220).

Issued this ______ day
of ______________, 1990

STATE OF FLORIDA DEPARTMENT
OF ENVIRONMENTAL REGULATION

____
Dale Twachtmann, Secretary

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TARMAC FLORIDA, INC.

P.O. Box 2998
Hialeah, Florida 33012

RECEIVED
FEB 20 1990
DER - BAQM

February 15, 1990

Mr. John Reynolds
Permitting Engineer
Division of Air Resources Management
Fla. Dept. of Environmental Regulation
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

RE: Proposed Modification - Kiln 2 Coal Conversion
PSD-FL-142; DER File No. AC13-169901

Dear Mr. Reynolds:

Please find enclosed the original *Waiver Of 90 Day Limit* which was sent via facsimile to you this date regarding the pending permit application for the above source. Should you have any questions please call me at (305)823-8800.

Sincerely,

Scott Quaas
Environmental Specialist

cc: A. Townsend
D. Buff - KBN Engineering
C. Andrews
M. Flores
ENF [illegible]

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TARMAC FLORIDA, INC.
P.O. Box 2998
Hialeah, Florida 33012

Mr. John Reynolds
Permitting Engineer
Fla. Dept. of Environmental Regulation
2600 Blair Stone Rd.
Tallahassee, Florida 32399-2400

Tarmac

TARMAC FLORIDA, INC.

P.O. Box 2998
Hialeah, Florida 33012

WAIVER OF 90 DAY TIME LIMIT
UNDER SECTIONS 120.60(2) AND 403.0867 FLORIDA STATUTES

License (Permit, Certification) Application No. AC13-169901

Applicant's Name: TARMAC FLORIDA, INC.

The undersigned has read Sections 120.60(2) and 403.0876, Florida Statutes, and fully understands the applicant's rights under that section.

With regard to the above referenced license (permit, certification) application, the applicant hereby with full knowledge and understanding of (his) (her) (its) rights under Sections 120.60(2) and 403.0876, Florida Statutes, waives the right under Sections 120.60(2) and 403.0876, Florida Statutes, to have the application approved or denied by the State of Florida Department of Environmental Regulation within the 90 day time period prescribed in Sections 120.60(2) and 403.0876, Florid Statutes. Said waiver is made freely and voluntarily by the applicant, is in (his) (her) (its) self-interest, and without any pressure or coercion by anyone employed by the State of Florida Department of Environmental Regulation.

This waiver shall expire on the 30th day of March, 1990.

The undersigned is authorized to make this waiver on behalf of the applicant.

Signature

Scott Quaas - Environmental Specialist
Typed Name and Title

2-15-90
Date

(305)823-8800
Telephone No.

KBN

January 22, 1990
89025

Mr. C.H. Fancy, P.E.
Bureau of Air Regulation
Florida Department of Environmental Regulation
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Re: Proposed Modification - Kiln No. 2 Coal Conversion
PSD-FL-142 - AC13-169901

Dear Mr. Fancy:

Please find enclosed the article entitled "Antidumping Petition On Behalf Of Az-Nm-Tx-Fl Producers of Gray Portland Cement". This article was inadvertently left out of KBN's response letter dated January 15, 1990, concerning the above referenced permit application.

Sincerely,

David A. Buff

David A. Buff, M.E., P.E.
Principal Engineer

cc: Bruce Miller, EPA✓

DAB/mla

cc: J. Reynolds
B. Andrews
M. Finn
J. Goldman, SE Dist.
P. Wong, DERM
C. Shaver, NPS
CHF/JKP/BT

RECEIVED
JAN 24 1990
DER - BAQM

KBN ENGINEERING AND APPLIED SCIENCES, INC.
1034 Northwest 57th Street Gainesville, Florida 32605 904/331-9000 FAX: 904/332-4189

ESVILLE

JAN23'90

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0.85

KBN ENGINEERING
AND APPLIED SCIENCES, INC.
1034 NW 57th Street
GAINESVILLE, FLORIDA 32605

Mr. C.H. Fancy, P.E.
Bureau of Air Regulation
FL. Dept. of Environmental Regulation
2600 Blair Stone Road
Tallahassee, FL 32399-2400

ANTIDUMPING PETITION ON
BEHALF OF THE AD HOC COMMITTEE
OF AZ-NM-TX-FL PRODUCERS
OF GRAY PORTLAND CEMENT

EXPLANATORY NOTE

This brochure consists of two parts. Part 1 contains the cover page and the "Executive Summary" portions (with emphasis supplied) of an antidumping petition that was filed on September 26, 1989 with the United States International Trade Commission and with the International Trade Administration of the United States Department of Commerce by certain domestic cement producers against cement producers in Mexico.

Part 2 contains seven graphs that depict the devastating impact during recent periods of dumped cement from Mexico upon producers in Florida, Texas, New Mexico and Arizona.

Copies of the Petition may be obtained without charge from Joseph W. Dorn, Kilpatrick & Cody, 2501 M Street, N.W., Suite 500, Washington, D.C. 20037, telephone number 202/463-2525.

Before The

INTERNATIONAL TRADE ADMINISTRATION
UNITED STATES DEPARTMENT OF COMMERCE

And The

UNITED STATES INTERNATIONAL TRADE COMMISSION

Washington D.C.

In The Matter Of: GRAY PORTLAND CEMENT AND CLINKER FROM MEXICO	Total Pages: Investigation Proprietary Business Information For Which Petitioner Seeks Proprietary Treatment Has Been Deleted From Exhibit 8. This Information May Be Released Under APO Privileged Information Also Has Been Deleted From Exhibit 12. This Information May Not Be Released Under APO.

ANTIDUMPING PETITION ON BEHALF OF THE AD HOC COMMITTEE OF AZ-NM-TX-FL PRODUCERS OF GRAY PORTLAND CEMENT

Economic Consultants:
Andrew R. Wechsler
Kenneth Dunmore
Pieter T. Van Leeuwen
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1233 20th Street, N.W.
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(202) 833-5254

Joseph W. Dorn
Martin M. McNerney
Walter E. Spiegel
Gregory C. Dorris
KILPATRICK & CODY
Suite 500
2501 M Street, N.W.
Washington, D.C. 20037
(202) 463-2500

Attorneys for Petitioner

September 26, 1989

EXECUTIVE SUMMARY

1. OVERVIEW

Since 1983, Mexican producers have been dumping gray portland cement and cement clinker into Arizona, New Mexico, Texas, and Florida. Import volumes have been significant and increasing, and import unit values have been low and decreasing. Because gray portland cement is a fungible commodity, and because demand does not vary appreciably with price, less than fair value ("LTFV") imports have displaced domestic production ton for ton. Moreover, because cement production involves high fixed costs relative to variable costs, and because LTFV imports and domestic cement are excellent substitutes, U.S. producers have had to both lower prices and to refrain from price increases in order to avoid further losses of volume to Mexican producers.

In the Arizona-New Mexico-Texas Region, LTFV imports have continued to increase in the contraction phase of the construction/cement cycle, hammering domestic producers when they are most vulnerable. In the Florida Region, LTFV imports have prevented domestic producers from restoring prices to levels achieved in the preceding expansion phase of the Florida construction/cement cycle, notwithstanding a remarkable 44 percent increase in consumption from 1983 to 1989. As a result, in both the Florida Region, where demand is booming, and also in the AZ-NM-TX Region, where demand is depressed, domestic producers' return on assets in this capital intensive, cyclical industry has been abysmal. LTFV imports are causing and threatening to cause a gradual, involuntary liquidation of cement assets, as domestic producers realize inadequate returns on their investment. The injury to date is serious and the threat of additional injury is real and imminent, as Mexican producers continue to expand grossly underutilized capacity and to invest in import terminals, clinker grinding facilities, and ready-mixed concrete operations in the regional markets at issue.

2. **SCOPE OF PETITION**

- Antidumping petition against gray portland cement and cement clinker from Mexico.

- Filed on behalf of two independent regional industries--Arizona-New Mexico-Texas ("the AZ-NM-TX Region") and Florida ("the Florida Region").

3. **DUMPING MARGIN**

- The dumping margin is conservatively estimated at **96-111 percent.**

- According to the President of the Construction Materials Section of the National Chamber of Commerce of Monterrey, **the same cement sold in Mexico is being sold at half the price in the United States.**

4. **PREDATORY PRICING BY MEXICAN PRODUCERS**

- Not only are Mexican producers selling cement and clinker at LTFV under U.S. antidumping law, they are also pricing cement and clinker exports into the two regions at **less than their cost of production.**

- Unit Customs values of Mexican cement ($24-25 per ton) are well below the Mexican production costs recently reported by the Commission in its Investment Barriers Investigation ($27-35 per ton).

5. **MEXICAN IMPORTS INTO AZ-NM-TX ARE SIGNIFICANT AND INCREASING**

- From 1983 to 1988, **imports** from Mexico into the AZ-NM-TX Region more than **tripled,** notwithstanding the fact that **demand decreased 20 percent.**

- From 1983 to 1988, imports from Mexico into the AZ-NM-TX Region increased relative to consumption, from 3.1 percent to 14.0 percent.

- From 1983-1985 to 1986-1988, **average annual imports doubled**, and import penetration jumped from 4.9 percent to 11.9 percent of consumption.

6. <u>MEXICAN IMPORTS INTO FLORIDA ARE SIGNIFICANT AND INCREASING</u>

- From 1983 to 1988, imports from Mexico into Florida **increased more than six-fold.**

- From 1983 to 1988, import penetration increased from 5.1 percent to 22.4 percent of consumption.

- From 1983-1985 to 1986-1988, **average annual imports increased 113.3 percent**, as import penetration increased from 12.1 percent to 22.0 percent of consumption.

7. <u>CEMENT PRODUCERS ARE VULNERABLE TO LTFV IMPORTS</u>

- Gray portland cement ("cement") is a fungible bulk commodity.

- Because domestic cement and LTFV imports are excellent substitutes, domestic and LTFV import suppliers compete on the basis of price.

- Because a small price change for such a homogeneous product can induce large shifts in market shares, even a small dumping margin will result in a large loss of volume for domestic producers if they do not meet the lower import price.

- Cement is a capital intensive production process characterized by high fixed costs relative to variable costs.

- Trade barriers allow Mexican producers to exercise price discrimination and pursue different pricing strategies for their home and export markets. Mexican producers can price much more aggressively in the U.S. market since they only need to cover their variable costs and they do not need to be concerned over retaliatory pricing. The low variable cost structure of cement production gives Mexican producers significantly more latitude than domestic producers to decrease prices in order to capture market share.

- Because of the economic incentive to maintain capacity utilization to minimize fixed costs per unit of production, domestic producers must match lower prices of LTFV imports to avoid loss of market share.

- Because demand for cement is derived from demand for construction, and because cement represents a negligible share of the cost of construction, the demand for cement does not vary appreciably with price. Accordingly, the lower prices of LTFV imports do not create any additional demand for cement. **Rather, LTFV imports displace domestic production ton for ton.**

- Because cement producers have high fixed costs relative to variable costs, sales lost to LTFV imports not only reduce revenue, they also substantially increase per unit production costs and decrease earnings on remaining sales.

8. THE CONDITION OF THE DOMESTIC PRODUCERS IN THE TWO REGIONS IS UNHEALTHY AND DECLINING

- Based on Bureau of Mines data aggregated for the two regions, from 1983 to 1988 utilization of clinker capacity dropped from 83 percent to 73 percent, the quantity of portland cement shipped by AZ-NM-TX-FL producers decreased 14 percent, the value of cement shipped decreased 27 percent, and **the average value per ton shipped dropped 15 percent.**

- Since 1983, **7 cement plants have closed in AZ-NM-TX and 2 cement plants have closed in Florida.**

- Based on petitioner's prefiling survey of cement plants in the two regions, the average unit shipment value (FOB plant) of all cement products decreased 22 percent from 1983 to 1988.

- Aggregate **operating income** in the two regions **declined from $60 million in 1985 to an operating loss of over $6 million in 1988.**

- Relative to sales, operating income dropped from **16 percent in 1985 to a negative 2 percent in 1988.**

- **Aggregate** cash flow in the two regions **dropped** from a **positive $76 million in 1985 to a negative $14 million** in 1988.

- Moreover, the regional producers' return on assets has been abysmal. In 1988, **returns on the whole were negative, and not one producer in either region had an operating income to asset ratio that exceeded the risk free rate of return of a U.S. Treasury bond.**

- **As Congress indicated in the legislative history to the 1988 Trade Act, an industry is materially injured if imports prevent the realization of a return on investment sufficient to justify capital investment to maintain and expand capacity.** A higher rate of return on investment is required to cover the risks associated with capital intensive, cyclical industries, such as the industry producing gray portland cement.

- The fact that even the most cost efficient producer in the two regions cannot achieve an adequate return on investment in the face of unfairly priced imports underscores the material injury being suffered by these regional producers.

9. <u>LTFV IMPORTS FROM MEXICO THREATEN ADDITIONAL MATERIAL INJURY</u>

- Cement capacity in Mexico is underutilized and increasing.

- Mexican producers have targeted the AZ-NM-TX-FL markets as the dumping ground for excess and growing capacity.

- CEMEX, the largest cement producer in North America, **controls over 70 percent of Mexican cement capacity.**

- CEMEX is aggressively buying up import terminals, clinker grinding facilities, and ready-mixed concrete operations in the AZ-NM-TX region in order to ensure a growing share of the regional market.

10. <u>CONCLUSION</u>

- Mexican producers have been dumping gray portland cement into Arizona, New Mexico, Texas, and Florida since 1983.

- The estimated dumping margin is 96-111 percent.

- **LTFV imports from Mexico have displaced domestic production of** gray portland cement, **have decreased capacity utilization** and thereby increased per unit costs of production, **have depressed prices, and have materially depressed operating income.**

- LTFV imports from Mexico have made it impossible for even the most cost efficient producer to achieve an adequate rate of return on cement assets.

- LTFV imports have **materially injured** domestic producers both in the AZ-NM-TX Region and also the Florida Region.

- **The threat of additional injury is real and imminent**, as the Mexican producers continue to build export-oriented capacity aimed at the regional markets at issue.

- Petitioner does not seek to choke off imports or **deter fair import competition.**

- Petitioner merely **seeks the enforcement of U.S. law** and an end to **illegal dumping.**

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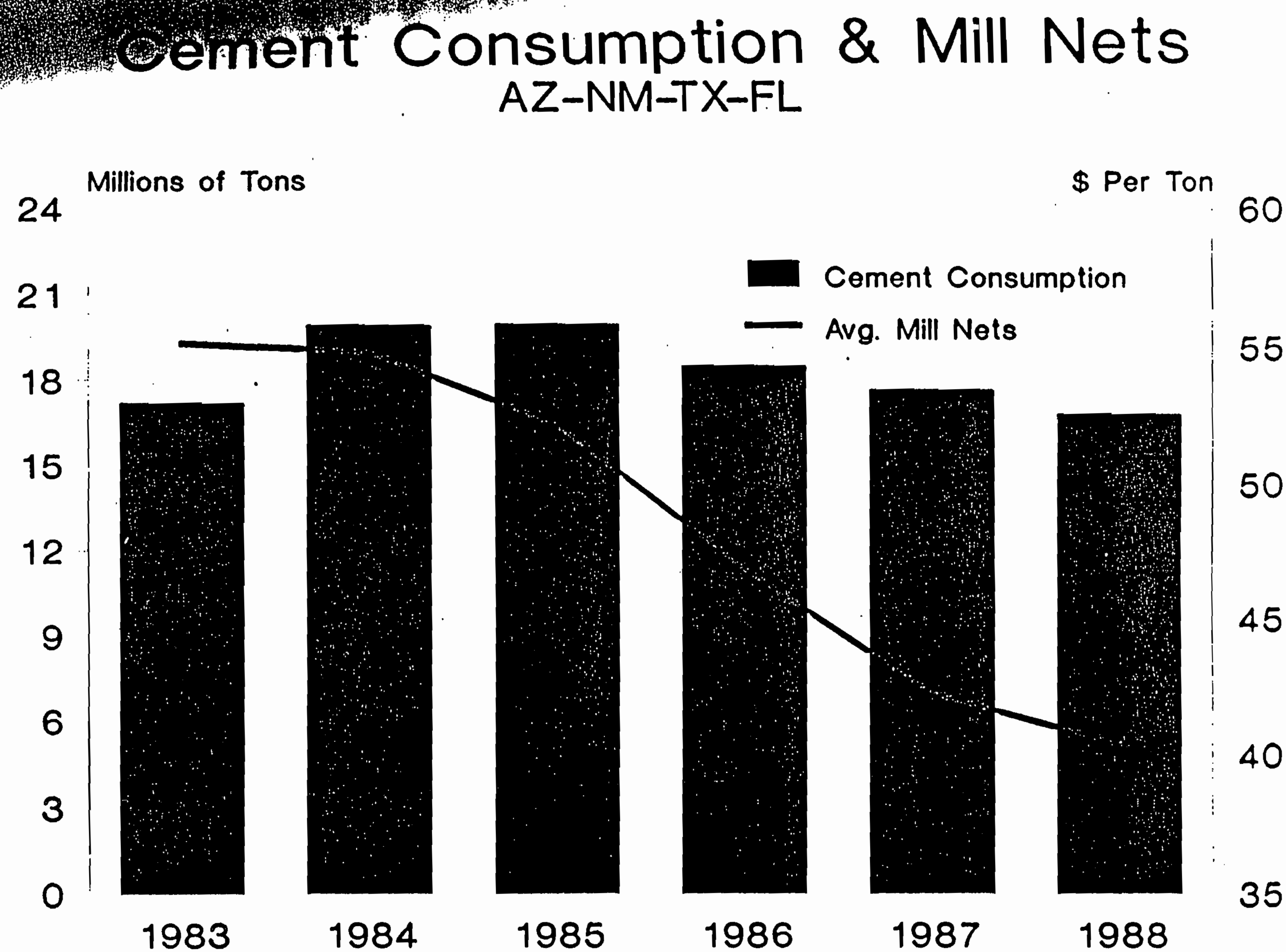
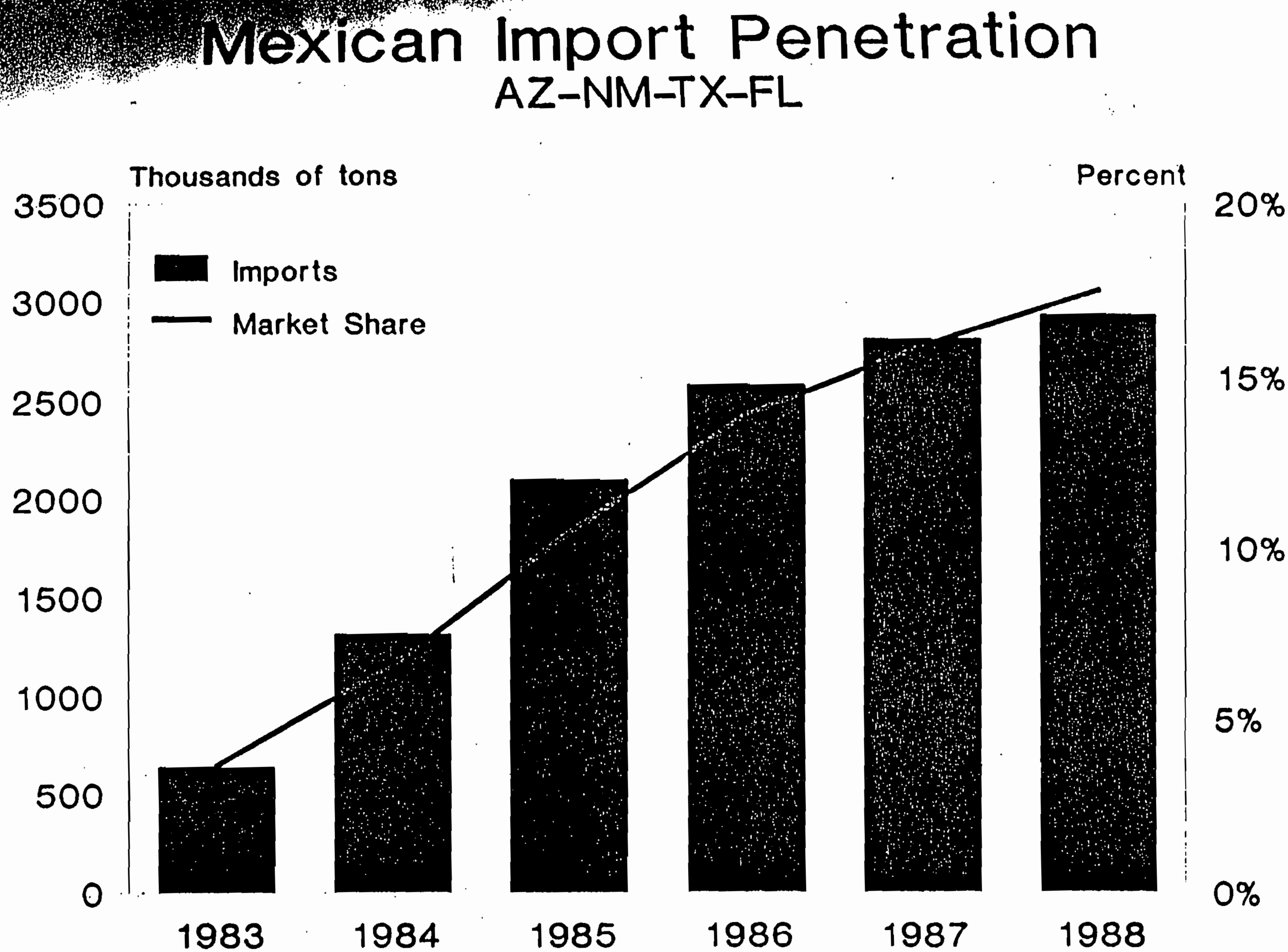
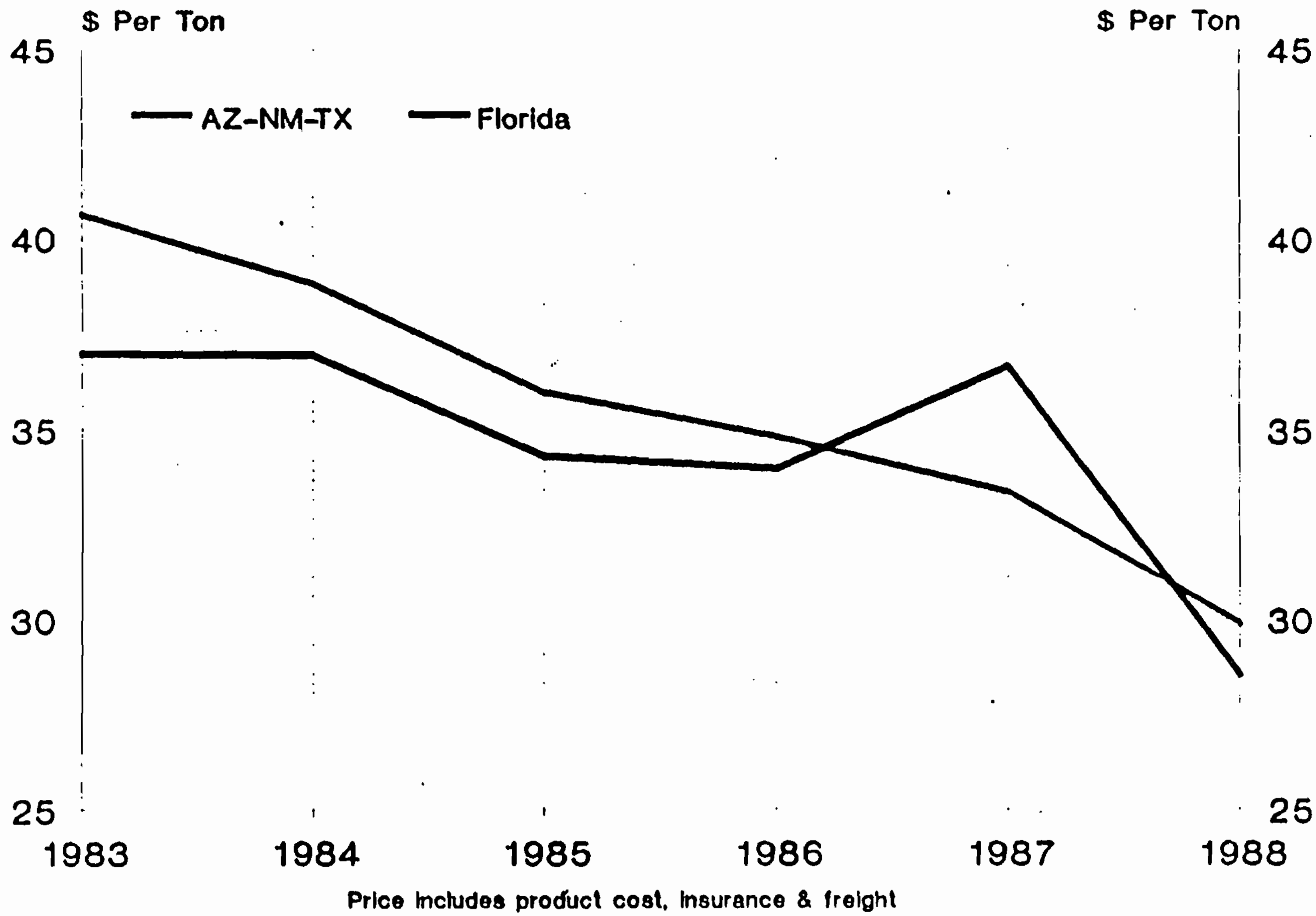


GRAPH A

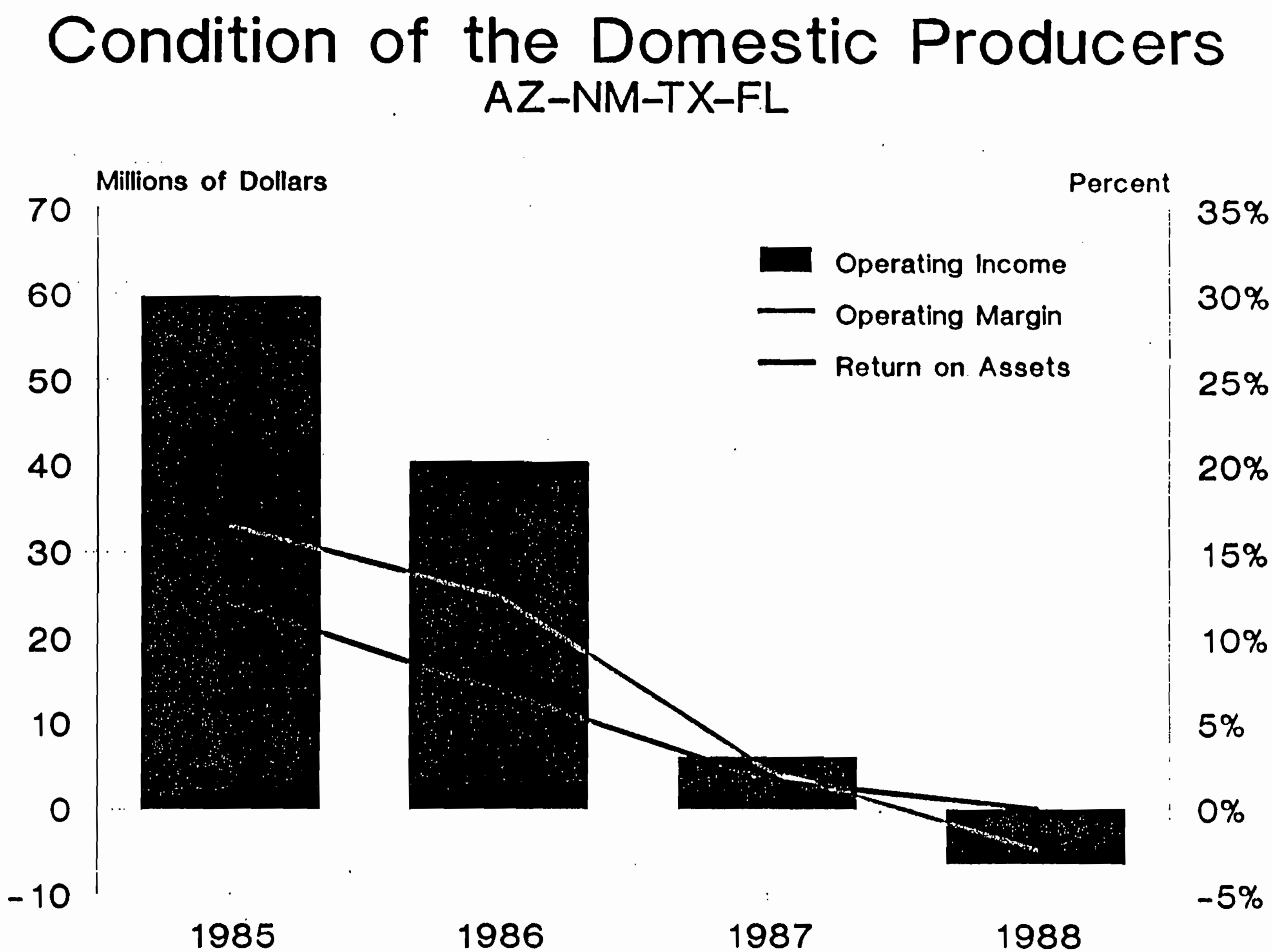

Mexican Import Penetration
AZ-NM-TX-FL
Thousands of tons
Percent
3500
3000
2500
2000
1500
1000
500
0
20%
15%
10%
5%
0%
Imports
Market Share
1983
1984
1985
1986
1987
1988

GRAPH B

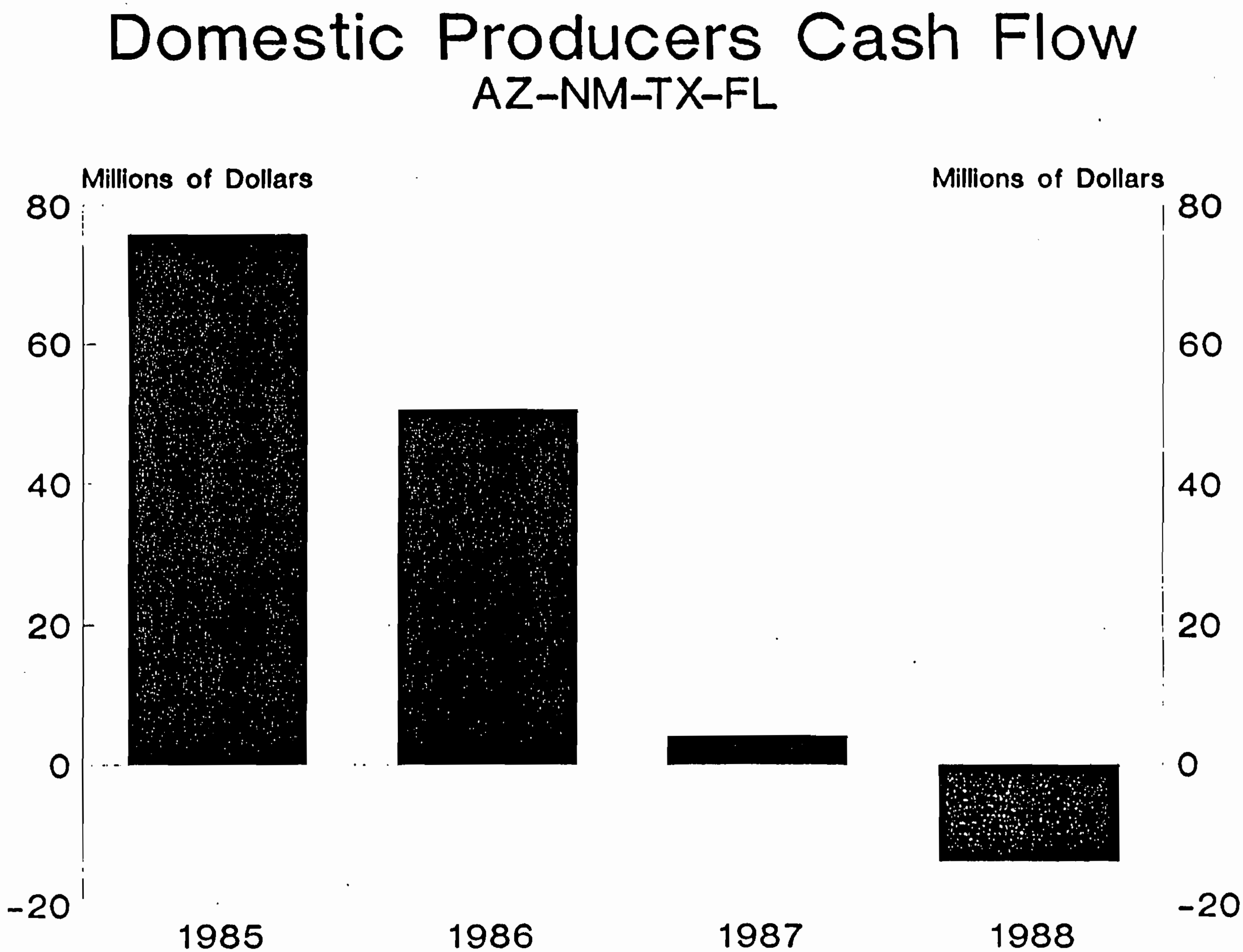
Mexican Cement Import Prices



GRAPH C

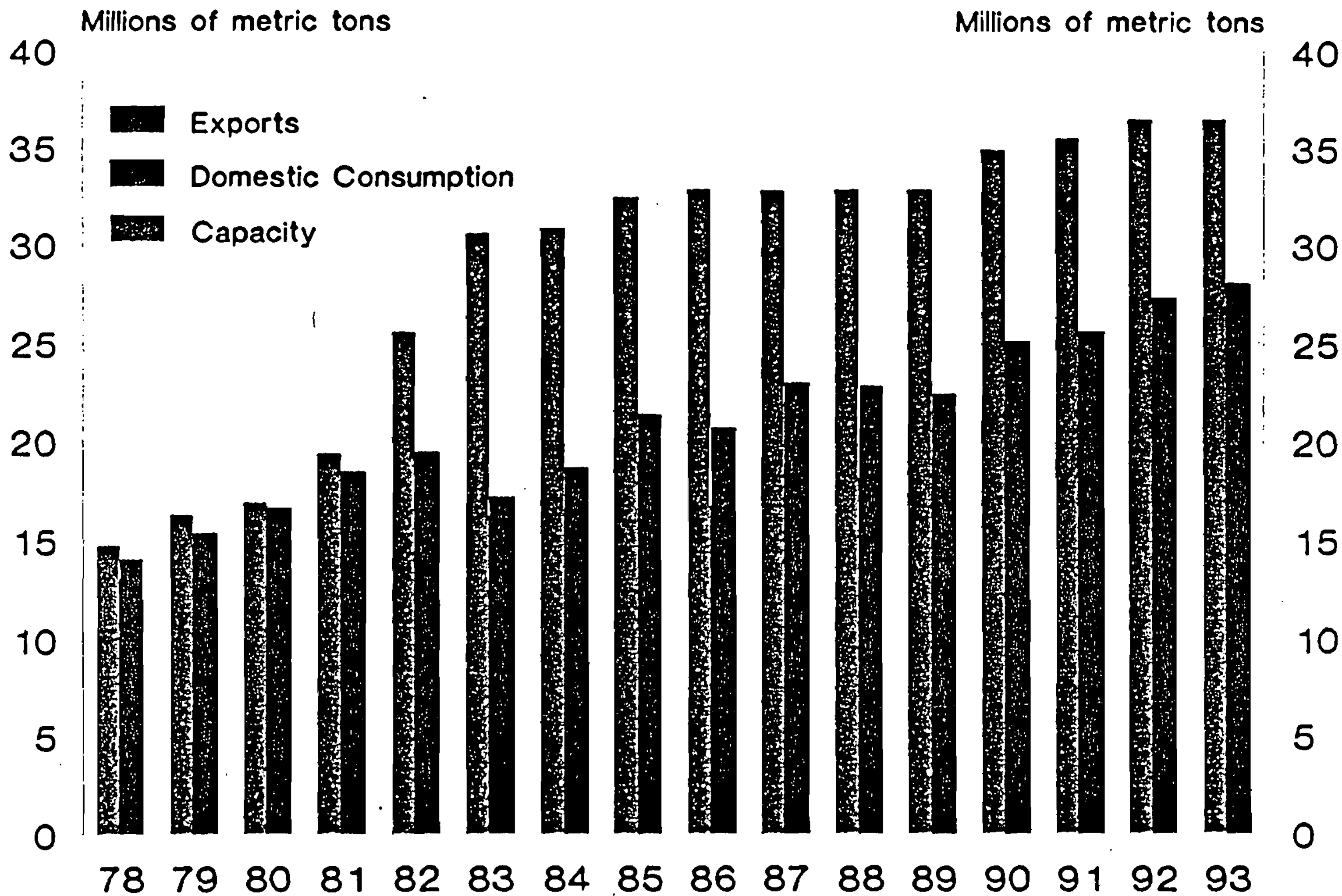

Condition of the Domestic Producers
AZ-NM-TX-FL
Millions of Dollars
Percent
70
60
50
40
30
20
10
0
-10
35%
30%
25%
20%
15%
10%
5%
0%
-5%
Operating Income
Operating Margin
Return on Assets
1985
1986
1987
1988

GRAPH D


Domestic Producers Cash Flow
AZ-NM-TX-FL
Millions of Dollars
Millions of Dollars
80
60
40
20
0
-20
1985
1986
1987
1988

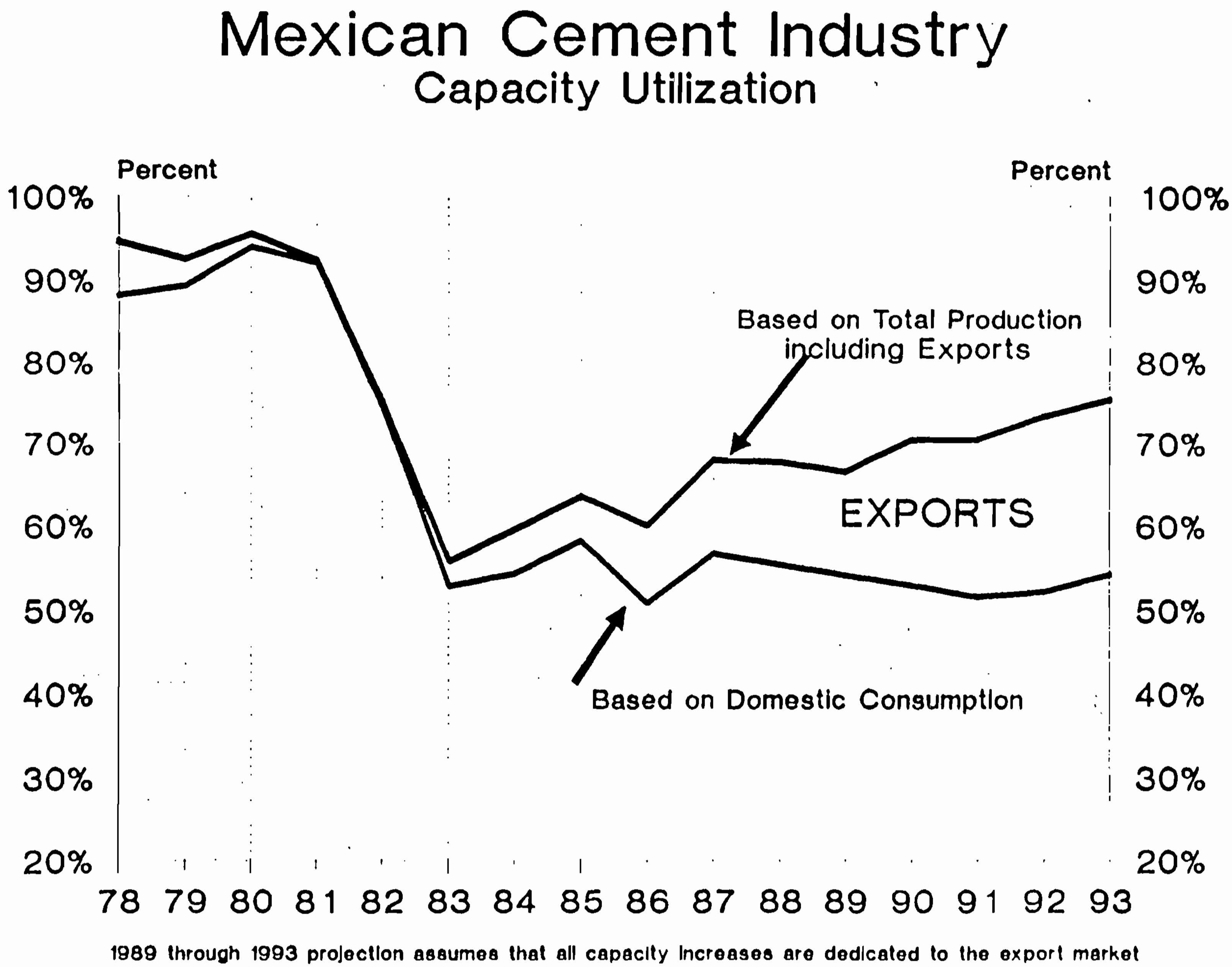
GRAPH E

Mexican Cement Industry



1989 through 1993 projection assumes that all capacity increases are dedicated to the export market

GRAPH F


Mexican Cement Industry
Capacity Utilization
Percent
Percent
100%
90%
80%
70%
60%
50%
40%
30%
20%
Based on Total Production including Exports
EXPORTS
Based on Domestic Consumption
78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93
1989 through 1993 projection assumes that all capacity increases are dedicated to the export market

GRAPH G

KBN

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January 15, 1990
89025

Mr. C.H. Fancy, P.E.
Bureau of Air Regulation
Florida Department of Environmental Regulation
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Re: Proposed Modification - Kiln No. 2 Coal Conversion
PSD-FL-142 - AC13-169901

Dear Mr. Fancy:

The purpose of this correspondence is to provide the department with additional information concerning the above- referenced permit application. Two major areas are addressed herein: the first being responses to EPA's comments contained in their letter to the department dated December 13, 1989; the second being Tarmac's position on the subject of applicability of federal New Source Performance Standards (NSPS) to the Kiln 2 modification.

EPA COMMENTS

1. APPLICABILITY DETERMINATION

EPA's main concern with the PSD applicability determination was that actual operating hours/production rates were not used in determining the starting point for PSD applicability. Although KBN does not believe a source should be penalized merely because it did not operate at its permitted capacity, as stated in the preamble to the 1980 PSD regulations, this is a subject that will be debated with EPA outside of this permit application. In order to facilitate review of this application and to resolve EPA's concerns, we have recalculated the actual emissions for Kiln 2 based on actual production rates.

Presented in Tables 1 through 5 attached are calculated actual emissions from Kiln 2 for the years 1980 and 1981 (the two most recent full years of kiln operation). Actual emissions from Kiln 2 for particulate matter [PM(TSP) and PM10] are shown in Table 1. The emissions are based on actual PM(TSP) stack test results from which an emission factor (lb/ton clinker produced) was derived. This emission factor was then applied to the actual production for the kiln for 1980 and 1981. The baseline emissions were calculated as the 2-year average emission rate. PM10 emissions were calculated as 85 percent of PM(TSP) emissions, as described in Tarmac's previous submittals.

Actual NOx emissions from Kiln 2 are shown in Table 2. These are based on the NOx source tests conducted on Kiln 2 in 1980, from which a lb/ton clinker produced factor was calculated for both gas and oil firing. These emission factors were used in conjunction with actual clinker production for the kiln to calculate actual emissions. Only gas was burned in Kiln 2 during 1980 and 1981.

KBN ENGINEERING AND APPLIED SCIENCES, INC.
1034 Northwest 57th Street Gainesville, Florida 32605 904/331-9000 FAX: 904/332-4189

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JAN 15 '90

U.S. POSTAGE

Mr. C.H. Fancy, P.E.
Bureau of Air Regulation
Florida Department of Environmental Regulation
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

KBN ENGINEERING AND APPLIED SCIENCES, INC.
1034 Northwest 57th Street Gainesville, Florida 32605

Actual SO2 emissions were calculated in a similar fashion, based upon SO2 source tests conducted on Kiln 1 in 1979 (see Table 3). No SO2 tests were conducted on Kiln 2, but the kilns are identical and should display similar emission factors. Emission factors in lb/MM Btu heat input for both gas and oil were calculated and applied to the fuel consumption in the kiln (gas only in 1980 and 1981).

Actual emissions of CO are shown in Table 4. No CO tests have been conducted on the kilns at Tarmac, and there are no known CO emission factors for cement plants. However, ESP operation requires the CO level in the kiln to be maintained below 1,000 ppm to prevent potential explosion in the ESP. Therefore, for purposes of calculating actual emissions, a flue gas content of 1,000 ppm was assumed. Actual air flow rates from the yearly stack tests were used to calculate emissions and an emission factor in terms of lb/ton clinker produced. This factor was then applied to the actual clinker production from the kiln.

Actual emissions of VOC, presented in Table 5, are based on the only VOC stack test conducted at Tarmac, on Kiln 3 in 1988. The average VOC emissions from the stack tests were utilized. From this stack test, an emission factor of 0.87 lb/ton clinker produced, due to organics in the raw feed, was derived (see previous Tarmac submittals). Emission factors for gas and oil combustion were based on AP-42 emission factors. These factors were applied to the clinker production and fuel usages for Kiln 2. It is noted that the VOC data are very limited, may not be strictly applicable to Kiln 2, and therefore may not be representative of Kiln 2 operation. Kiln 2 is less energy efficient and is shorter in length than Kiln 3, and therefore VOC destruction within Kiln 2 may not be as good as in Kiln 3. However, there are no data for Kilns 1 or 2, since they are shutdown. The only VOC data available for the Tarmac kilns are from Kiln 3 and, therefore, were used in this analysis.

The revised PSD source applicability analysis for Kiln 2, using the above described actual emissions as a baseline, is presented in Table 6. In determining future maximum emissions for Kiln 2, 90 percent capacity factor [equivalent to 197,100 tons per year (TPY) clinker production] was assumed. Tarmac is willing to limit their maximum operation to this level, since the kiln is not expected to exceed this rate due to kiln downtime.

For PM, the fugitive emission increases associated with Kiln 2 coal burning are included in the applicability determination. Tarmac is willing to limit Kiln 2 PM(TSP) emissions to 14.4 lb/hr and 56.76 TPY, and PM10 emissions to 12.2 lb/hr and 48.25 TPY. This results in PM increases of 14.8 TPY for PM10 and 18.6 TPY for PM(TSP), both of which are below the PSD significant emission rate. It is emphasized that Tarmac expects <u>no increase</u> in hourly PM emissions from the kiln due to the coal conversion. Non-volatiles in the coal (i.e., ash) will replace raw feed to the kiln on a one-for-one basis, such that the total solids in the kiln will not increase, and particulate reaching the ESP should not increase. Therefore, emissions from ESP should not increase. The calculated increase in PM emissions due to the coal conversion is solely due to the EPA mandated method of determining PSD applicability.

The future requested SO2, NOx, and sulfuric acid mist emissions result in emission increases above the PSD rates, as acknowledged in previous submittals by Tarmac. The requested tons per year for these pollutants are slightly lower than previous due to the reduced annual operating rate for the kiln (197,100 TPY clinker). Both baseline and future sulfuric acid mist emissions are based on the estimated 3 percent of SO2 emissions (see previous submittals).

For CO, Pb, and Be, increases in tons per year are shown for these pollutants, with the increase in CO being below the PSD trigger level. Baseline emissions for Pb and Be are based upon the clinker production for Kiln 2 in 1980 and 1981 and the emission factors presented previously: 0.1 lb/ton for Pb and 0.002 lb/ton for Be. However, it is emphasized that Tarmac expects <u>no increase</u> in hourly emissions of these pollutants due to the coal conversion. The calculated increases are solely due to EPA's mandated method of determining PSD applicability. In the case of Pb and Be, the increases are of such magnitude that PSD review is triggered.

There is expected to be no increase, or minimal increase, in VOC emissions due to the coal conversion. Converting from gas/oil firing to coal itself would result in only insignificant changes in VOC emissions due to the changes in the fuel itself. Emissions due to organics in the raw feed would not change. However, since the only test data for VOC are from Kiln 3 and VOC emissions from Kiln 3 may be substantially different than from Kiln 2 due to differences in the kilns, Tarmac is selecting the highest emission rate (28.8 lb/hr, 113.5 TPY) which would not trigger nonattainment new source review.

Since under this revised PSD applicability determination PSD review is now required for Pb and Be, a BACT analysis and air monitoring analysis are needed for these pollutants. These analysis are presented below.

BACT for Pb and Be control is the existing ESP for Kiln 2, which controls solid particulate emissions, including metals, with a high efficiency. There is no other control device that can control these emissions with a higher degree of removal than the ESP. As a result, the ESP meets the "top-down" criteria, and no other control technologies need to be analyzed. The emission rates for both Pb and Be are minimal.

The maximum air quality impact of the Pb emissions can be ascertained from the revised SO2 impact analysis contained in Tarmac's November 1989 submittal. The maximum impact of Kiln 2 emitting at only 400 lb/hr (1,752 TPY) was predicted to be 4.1 $\mu g/m^3$ annual average, and 61 $\mu g/m^3$ 24-hour average. Therefore, for a Pb emission increase of 1.46 TPY from Kiln 2 (see Table 6), the maximum annual impact of the Pb increase would be 0.0034 $\mu g/m^3$. The maximum calendar quarter average Pb impact would therefore have to be less than four times the annual average, or less than 0.014 $\mu g/m^3$. This impact would be less than the PSD de minimis monitoring concentration of 0.1 $\mu g/m^3$, calendar quarter average.

In the case of Be, there will be no measurable increase in hourly emissions of Be. Therefore, maximum 24-hour impacts of Be due to the coal conversion will not increase.

2. BACT DETERMINATION FOR SO2

The first concern EPA expresses in regards to the BACT for SO2 is that the requested emission rate for Kiln 2 is too high in relation to the emission limit for Kiln 3. They reason that the SO2 removal should be similar for the two kilns when burning coal, since they are similar when burning oil/gas. In fact, the information shown in the permit application demonstrates that the removal efficiencies for the two kilns are very different: 98.7 percent for Kiln 3 and 91.3 percent for Kiln 2. This translates to an emission rate for Kiln 2 which is 750 percent higher than that for Kiln 3 (on a lb/ton basis). Factors which can affect SO2 removal in the kiln are the length of the kiln (affects retention time), temperature, and oxygen content. Kiln 2 is less energy efficient than Kiln 3, and therefore sulfur input due to coal will be higher on a lb/ton basis for Kiln 2. Kiln 2 is a smaller (shorter) kiln than Kiln 3, and therefore residence times of the gases in Kiln 2 are less. These aspects of Kiln 2 translate into potentially higher SO2 emissions compared to Kiln 3.

EPA conducted a review of the NSPS for Portland® cement plants in 1985. The review document states that data and mass balance calculations indicate that 35 to 75 percent of the SO2 emissions are removed in the production process (i.e., kiln plus control device). Tarmac's stated minimum SO2 removal of 36 percent is therefore consistent with this past industry experience.

Tarmac does not believe that SO2 emissions from Kiln 2 will be as high as requested. The problem is, without adequate test data on the kiln, what should the emission limit be? No one knows the answer to this until the kiln can be converted and tested. This is precisely why Tarmac is proposing, and is willing to accept as a permit condition, a testing plan which will define the appropriate emission limit for the kiln. This will avoid the past mistake on Kiln 3 of trying to guess an emission limit that can be met, and guessing wrong.

There seems to be no argument that the control technology for SO2 removal is the cement kiln itself (i.e., no add-on control equipment). As such, the cement kiln will without a doubt remove SO2 and act as an SO2 removal device whenever it is operating. The amount will be dependent on how the kiln is operated, which will in turn depend on product quality as well as the information obtained from the emission testing. So the only question here is what the appropriate emission limit is. The proposed testing plan will answer this, but this cannot happen until the kiln is operated on coal.

The second EPA concern is the use of 2 percent sulfur coal instead of lower sulfur coal (1 percent). Tarmac's concern with the use of low sulfur coal is the cost impact upon clinker production costs. Information presented in Tarmac's November submittal showed that use of low sulfur coal would increase production costs by $3.00 or more per ton of clinker produced, representing more than an 8 percent increase above current production costs. The effect such an increase would have on Tarmac operations are enumerated in the attached "Antidumping Petition On Behalf Of The Ad Hoc Committee Of Az-Nm-Tx-Fl Producers Of Gray Portland® Cement". This petition shows that the effects of foreign cement dumping in these four states has been devastating. Subsidized, under-priced Mexican imports have resulted in domestic producers such as Tarmac artificially lowering prices, in many cases below actual production costs, in order to maintain their market share. Despite such drastic measures, two cement plants in Florida and seven plants in the other three states have closed since 1983. During this same period, three new import terminals have opened in Florida (two in Tampa and one in Port Manatee) and one existing terminal has doubled in capacity. Cement sales in Florida have followed the following pattern during the period 1979 through 1989:

	CEMENT (1000 tons)		IMPORTS
YEAR	Total	Imports	(% of total)
1979	4,602	1,390	30%
1980	5,412	1,278	24%
1981	5,335	1,030	19%
1982	4,081	709	17%
1983	4,866	905	19%
1984	6,253	2,267	36%
1985	6,140	3,203	52%
1986	6,360	3,742	59%
1987	6,819	3,636	53%
1988	7,277	3,780	52%
1989	7,330	3,650	50%

PSD

As shown, foreign imports continue to represent roughly one-half of the total cement sold in Florida.

Focusing on the Florida situation, there are currently six cement plants located in the state. Two of these (General Portland plants in Miami and Tampa) are shut down due to economic conditions, and a third (the Tarmac plant in Miami) is operating at only half capacity with two kilns shut down. The General Portland plants are shut down even though one is permitted to burn 2.0 percent sulfur coal , and the other is permitted to burn 5.0 percent sulfur oil. Rinker cement, located in Miami, is currently operating and burning 1.8 percent sulfur coal. Rinker has no emission limits on SO2 or on coal sulfur content. The two other plants in Florida, Florida Crushed Stone (FCS) and Florida Mining and Materials (FMM), are both located in Hernando County, north of Tampa. The FCS plant is a new integrated power plant/cement plant which can economically burn 0.8 percent sulfur coal. FMM has no sulfur limits in their current operating permits and, therefore, can burn the most economical coal available.

The added cost of low sulfur coal for Kiln 2 would make conversion to coal economically prohibitive. Production cost of the clinker produced by the kiln would be higher than the market price. The imposition of low sulfur coal would not be fair to Tarmac when its closest competitor, Rinker, is allowed to burn 1.8 percent sulfur coal. Thus, Tarmac could not justify restarting the kiln. This would result in a loss of jobs and tax revenue for Dade County and the state of Florida.

The situation in Florida, Arizona, New Mexico, and Texas cannot be compared to other states in the U.S. Cement is a captive market which is tied to local consumption. Thus, producers outside of these four states do not have to compete with the Mexican imports, either on price or on market share. With prices being higher and more stable in other states, it is more likely that a cement plant could burn lower sulfur coal and be competitive. It is also easier for a less energy intensive new, dry process kiln to burn low sulfur coal as compared to Tarmac's older, more energy intensive wet process kiln. In addition, Tarmac is at a further disadvantage in that they are located a long distance from the coal mines. Coal delivered to Tarmac is, therefore, more costly due to freight charges.

A review of the BACT Clearinghouse documents reveals that no new or modified cement kilns have been permitted under PSD in the entire United States since 1986. Since 1983, only four PSD permits have been filed in the United States This undoubtedly reflects the penetration of foreign imports on the entire United States market. One of the four permits was for coal conversion of the three kilns at the Tarmac plant (then called Lonestar). The BACT determination required 2.0 percent sulfur coal maximum (1.75 percent on a monthly average). Only one kiln was actually converted, with the other two kilns shutdown due to economic reasons.

Two of the four PSD permits were for dry process kilns in California and Nevada. One of these was for a Lonestar plant, which was converting to a dry process. The second was for a new dry process kiln, at an existing plant. This new kiln was never built, and the permit has expired.

The last of the four permits was for the Florida Crushed Stone plant in Brooksville, Florida. This was a special case of an integrated power plant/cement plant which utilized a dry process kiln, and common coal for the power plant and cement plant. This plant has a unique integrated design which is extremely energy efficient. Low sulfur coal (0.8 percent) was permitted primarily to protect the Chassahowitzka Class I area and allow for future industrial growth, but was also feasible because of the large quantity of coal used by the shared facilities and the overall energy efficiency of the shared facilities.

APPLICABILITY OF FEDERAL NEW SOURCE PERFORMANCE STANDARDS

Regarding the applicability of federal NSPS to the Kiln 2 coal conversion, Kiln 2 was initially constructed and began operating in 1969, before the NSPS for Portland® cement plants were promulgated. The NSPS regulate PM emissions only. It is Tarmac's position that the conversion of Kiln 2 to coal will not increase PM emissions on a lb/hr basis. As a result, the conversion would not be a modification under 40 CFR Part 60.

GULF POWER BUYS FROM SOUTH AFRICA

C.H. Fancy
January 15, 1990
Page 7

If you have any questions concerning this submittal, please call me at 904-331-9000. I appreciate your cooperation in reviewing this important information.

Sincerely,

David A. Buff

David A. Buff, M.E., P.E.
Principal Engineer

cc: Scott Quass
Al Townsend
Bruce Miller, EPA

DAB/mla

copied: J. Reynolds
B. Andrews
M. Finn
I. Goldman, SE Dist
P. Wong, DERM
C. Shaver, NPS
CHF/JKP/BT

Table 1. Baseline PM Emissions For PSD Source Applicability Analysis, Tarmac Kiln 2

Year	Clinker Production (tons)	PM(TSP) Test Data+ Emissions (lb/hr)	Production (tons/hr)	Factor (lb/ton)	PM(TSP) Emissions (TPY)	PM10 Emissions** (TPY)
1980	184,922	16.00	24.09	0.67	61.95	52.66
1981	150,690	8.17	26.76	0.31	23.00	19.55
				Average =	42.48	36.10

* Gas = MM scf
  Oil = M gal
\+ Based on yearly stack test results
** Calculated as 85% of PM(TSP) emissions.

PMBASE2
1/11/90

Table 2. Baseline NOx Emissions For PSD Source Applicability Analysis, Tarmac Kiln 2

Year	Clinker Production (tons)	Fuel	Fuel Usage*	Heat Input (MM Btu)	NOx Emissions lb/ton+	NOx Emissions tons/yr
1980	184,922	gas	1209	1,269,450	4.73	437.3
1981	150,690	gas	944	991,200	4.73	356.4
					Average =	396.9

* Gas = MM scf
  Oil = M gal
\+ Based on only NOx stack test, conducted in 1980.

NOXBASE2
1/11/90

Table 3. Baseline SO2 Emissions For PSD Source Applicability Analysis, Tarmac Kiln 2

Year	Clinker Production (tons)	Fuel	Fuel Usage*	Heat Input (MM Btu)	SO2 Emissions lb/MM Btu+	SO2 Emissions tons/yr
1980	184,922	gas	1209	1,269,450	0.025	15.9
1981	150,690	gas	944	991,200	0.025	12.4
					Average =	14.1

* Gas = MM scf
  Oil = M gal
+ Based on SO2 stack tests conducted on Kiln 1 in 1979.

SO2BASE2
1/11/90

Table 4. Baseline CO Emissions For PSD Source Applicability Analysis, Tarmac Kiln 2

Year	Clinker Production (tons)	Stack Test Data* Prod. Rate (tons/hr)	ACFM	%H2O	Temp. (Deg.F)	CO+ (ppm)	CO (lb/hr)	lb/ton	CO Emissions tons/yr
1980	184,922	24.09	131,483	26.0	340	1000	378.3	15.7	1452.0
1981	150,690	26.76	138,023	27.0	345	1000	394.7	14.7	1111.2
								Average =	1281.6

* Based upon yearly stack test data.
\+ Assumed based on maximum tolerable CO level in kiln.

COBASE2
1/11/90

Table 5. Baseline Non-Methane VOC Emissions For Nonattainment New Source Review Applicability, Tarmac Kiln 2

Year	Clinker Production (tons)	Fuel	Fuel Usage*	Heat Input (MM Btu)	Non-Methane VOC Emissions lb/ton+	lb/MM Btu**	tons/yr
1980	184,922	gas	1209	1,269,450	0.87	0.0013	81.3
1981	150,690	gas	944	991,200	0.87	0.0013	66.2
						Average =	73.7

* Gas = MM scf
Oil = M gal
+ VOC emssions due to organics in feed, based on only VOC stack test, conducted on Kiln 3 in 1988.
** VOC emissions due to fuel combustion, based on AP-42 emission factors.

VOCBASE2
1/11/90

Table 6. Revised PSD/Nonattainment Source Applicability Analysis

Pollutant	Baseline Emissions (TPY)	Future Maximum Emissions (lb/hr)	Future Maximum Emissions (lb/ton)	Future Maximum Emissions (TPY)*	Net Increase (TPY)	PSD Significant Emission (TPY)
PM(TSP):						
Kiln 2	42.48	14.4	0.58	56.76		
Fugitive	0	-		4.30		
Total	42.48			61.06	18.58	25
PM10:						
Kiln 2	36.1	12.2	0.49	48.25		
Fugitive	0	-		2.64		
Total	36.1			50.89	14.79	15
SO2	14.1	400.0	16.00	1576.8	1562.7	40
NOx	396.9	169.3	6.77	667.4	270.5	40
CO	1281.6	350.0	14.00	1379.7	98.1	100
VOC	73.7	28.8	1.15	113.5	39.8	40 +
Pb	8.39	2.5	0.10	9.9	1.46	0.6
H2SO4 Mist	0.42	12.0	0.48	47.30	46.88	7
Be	0.168	0.050	0.002	0.197	0.029	0.0004

* Based on maximum of 197,100 tons clinker per year.
+ Significant emission rate for nonattainment review.

PSDSUM2
1/13/90

BEST AVAILABLE COPY

Tarmac

TARMAC FLORIDA, INC.

***   ***

FACSIMILE

****

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

Telephone: (305)823-8800
Facsimile: (305)825-1719

****

TO: John Reynolds -- Division of Air Resources Management

Facsimile No: (904)487-4938

DATE: January 12, 1990

FROM: Al Townsend

number of pages including cover sheet 2

Comments: Attached is a Waiver for Tarmac's Kiln 2 modification permit application. The original will be sent via regular mail. Should you have any questions please call me or Dave Buff.

01/13 06:41

BEST AVAILABLE COPY

Tarmac

TARMAC FLORIDA, INC.

P.O. Box 2998
Hialeah, Florida 33012

WAIVER OF 90 DAY TIME LIMIT
UNDER SECTIONS 120.60(2) AND 403.0867 FLORIDA STATUTES

License (Permit, Certification) Application No. AC13-169901

Applicant's Name: TARMAC FLORIDA, INC.

The undersigned has read Sections 120.60(2) and 403.0876, Florida Statutes, and fully understands the applicant's rights under that section.

With regard to the above referenced license (permit, certification) application, the applicant hereby with full knowledge and understanding of (his) (her) (its) rights under Sections 120.60(2) and 403.0876, Florida Statutes, waives the right under Sections 120.60(2) and 403.0876, Florida Statutes, to have the application approved or denied by the State of Florida Department of Environmental Regulation within the 90 day time period prescribed in Sections 120.60(2) and 403.0876, Florid Statutes. Said waiver is made freely and voluntarily by the applicant, is in (his) (her) (its) self-interest, and without any pressure or coercion by anyone employed by the State of Florida Department of Environmental Regulation.

This waiver shall expire on the 16th day of February, 1990.

The undersigned is authorized to make this waiver on behalf of the applicant.

Signature

Scott Quaas - Environmental Specialist
Typed Name and Title

1-12-90
Date

(305)823-8800
Telephone No.

PM
12-23-89
Miami FL

File Copy

KBN

December 21, 1989

Mr. C. H. Fancy, P.E.
Bureau of Air Regulation
Florida Department of Environmental Regulation
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Re: Proposed Modification - Kiln 2 Coal Conversion
PSD-FL-142; AC13-169901

Dear Mr. Fancy:

Mr. Barry Andrews of your staff has verbally requested additional information regarding the BACT analysis for the above referenced permit application. Barry requested that two items be addressed for the SO_2 BACT analysis. These items were:

1. Lower sulfur coal will provide a benefit since it is higher in heating value, thereby requiring less coal usage. This would translate into less SO_2 emissions and cost savings from coal purchases.

2. The effect of using lower sulfur coal on sulfuric acid emissions.

In regards to the first item, Barry has assumed that the heating value of coal is inversely related to the sulfur content; i.e., as sulfur content decreases heating value increases. This would imply additional benefits of less coal usage, lower coal costs, and lower SO_2 emissions. Barry stated that these additional benefits of lower sulfur coal should be addressed in the BACT analysis.

To investigate Barry's concerns, Tarmac has analyzed their coal analysis data for the period January 1987 through December 1989. Tarmac took weekly coal samples during this period. As part of the coal analysis, sulfur content and heating value are measured.

KBN ENGINEERING AND APPLIED SCIENCES, INC.
1034 Northwest 57th Street Gainesville, Florida 32605 904/331-9000 FAX: 904/332-4189

TARMAC FLORIDA, INC.
P.O. Box 2998
Hialeah, Florida 33012

PM
23 DEC
1983

Mr. C. H. Fancy, P.E.
Bureau of Air Regulation
Florida Department of Environmental Regulation
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Presented in the attached figure is a plot of coal sulfur content versus coal heating value. As indicated, there is essentially no correlation between sulfur content and heating value. In fact, some of the lowest heating values occur with the lowest sulfur contents. This occurs because heating value is affected by other parameters as well, such as moisture and ash contents. As a result, there is no basis for concluding that lower sulfur coal will be higher in heating value. Therefore, it is not proper to assume this for the BACT analysis.

In regards to sulfuric acid mist, reduction in coal sulfur content will presumably result in proportionately less sulfuric acid mist emissions. In the application, sulfuric acid mist emissions were estimated as 3% of the SO_2 emissions. For various sulfur content coals utilized in K2, the sulfuric acid mist emissions would be as follows:

2.0% S coal - 12.0 lb/hr., 52.6 TPY
1.5% S coal - 9.5 lb/hr., 41.6 TPY
1.0% S coal - 7.0 lb/hr., 30.7 TPY

Thank you for the opportunity to submit this information. Please call if you have any questions.

Sincerely,

David A. Buff

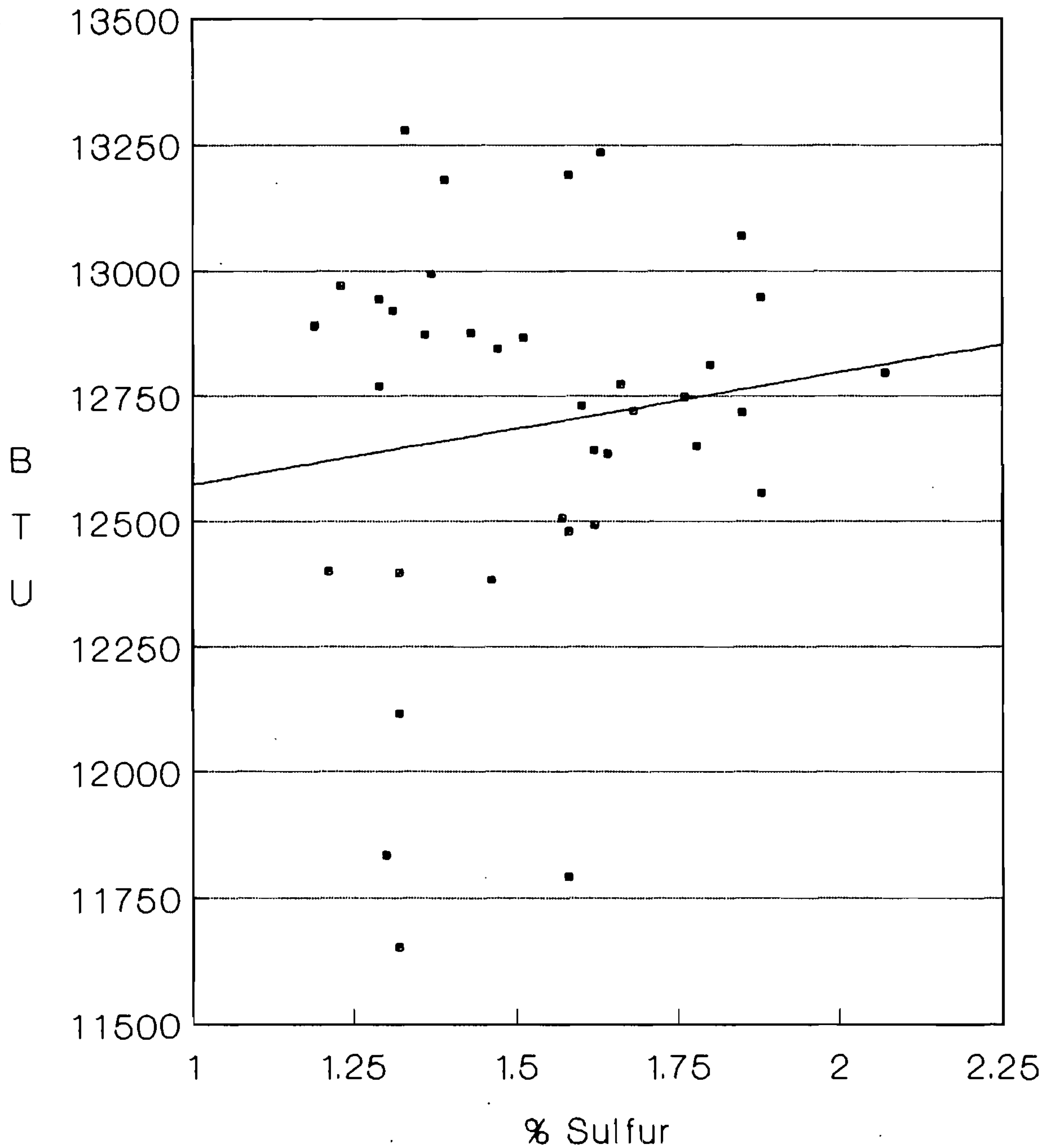
David A. Buff., M.E., P.E.
Principal Engineer

cc: Al Townsend
BT/JP
John Reynolds
Barry Andrews
Max Linn

12-26-89 Bm

Tarmac

COAL (as fired)
BTU vs % Sulfur



Weekly Average (Jan. 1987-Dec. 1989)

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION IV
345 COURTLAND STREET, N.E.
ATLANTA, GEORGIA 30365

DEC 13 1989

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Mr. Clair Fancy, P.E., Chief
Bureau of Air Regulation
Florida Department of Environmental
Regulation
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

RE: Tarmac Florida, Inc. (PSD-FL-142)

Dear Mr. Fancy:

We have received the November 13, 1989, letter and enclosures thereto from Mr. David A. Buff of KBN Engineering and Applied Sciences, Inc., transmitted to us by your Agency. As you are aware, this submittal by KBM was intended to address EPA's concerns with the application for Tarmac's proposed kiln 2 coal conversion project.

Applicability Determination

In reviewing this submittal, it is obvious to us that certain very basic concepts of the Prevention of Significant Deterioration (PSD) rules continue to be misapplied by KBN. In our October 18, 1989 letter to Ms. Patricia Adams of your agency, we raised several concerns with the applicant's determination of historical baseline emissions for several pollutants. In the applicant's November 13, 1989, response to these comments, KBN has dismissed our concerns as being inconsistent with the PSD rules.

KBN has agreed that baseline emissions for determining the amount of potential emissions increases as a result of the kiln modification should be based on actual historical emissions. However, their calculations for determining these actual emissions are based on fictitious allowable operating hours and production rates. This in no way represents actual emissions. KBN has used these allowable operating hours and production rates in the calculations based on their statement that "an increase in the operating hours or in the production rate of a source does not constitute a physical change in the source or change in the method of operation." The issue here is not whether the kiln, prior to coal conversion, can operate at its allowable production and operational limits without triggering PSD, but the physical modifications to the kiln to accommodate the conversion to coal. This coal conversion is the change which has triggered possible applicability to PSD. Because a physical change

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Mr. Clair Fancy, P.E., Chief
Bureau of Air Regulation
Florida Department of Environmental
Regulation
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, FL 32399-2400

will be occurring, applicability to PSD is determined by calculating the net emissions increase of the change. A "net emissions increase" is defined as:

> "the amount by which the sum of the following exceeds zero: Any increase in actual emissions from a particular physical change or change in method of operation at a stationary source; and Any other increases and decreases in actual emissions at the source that are contemporaneous with the particular change and are otherwise creditable."

Major modifications are, therefore, determined by examining changes in actual emission levels. Actual emissions are defined as:

> "the actual rate of emissions of a pollutant from an emissions unit, as determined in accordance with sub-paragraph (ii)-(iv) below
>
> (ii) In general, actual emissions as of a particular date shall equal the average rate, in tons per year, at which the unit actually emitted the pollutant during a two-year period which precedes the particular date and which is representative of normal source operation. The Administrator shall allow the use of a different time period upon a determination that it is more representative of normal source operation. Actual emissions shall be calculated using the units actual operating hours, production rates and types of materials processed, stored, or combusted during the selected time period.
>
> (iii) The Administrator may presume that source specific allowable emissions for the unit are equivalent to the actual emissions of the unit.
>
> (iv) For any emissions unit which has not begun normal operations on the particular date, actual emissions shall equal the potential to emit of the unit on that date."

Although the regulations provide a presumption for the use of allowable emissions when source specific limits are established, the preamble at 45 FR 52718 (August 7, 1980) states that:

> "The presumption that Federally enforceable source specific requirements correctly reflect actual operating conditions should be rejected by EPA or a State, if reliable evidence is available which shows that actual emissions differ from the level established in the SIP or permit."

It is clear from the above discussion of the PSD rules that actual operating hours, production rates, etc., must be used in determining a net emissions increase. Since this data was not included in KBN's submittal, the application should be considered incomplete.

We also are concerned about KBN's choice of the representative time period in determining historic actual emissions. We would agree that the year 1982 could be eliminated since the kiln was shut down. The remaining years, however, appear normal and we see no reason to not use the 1980-1981 two year period for determining baseline emissions.

BACT Determination for SO_2

We disagree with the applicant's BACT determination for SO_2 in a number of respects. It is understandable that SO_2 emission reductions observed from kiln 3 would not necessarily be identical to the future reductions on kiln 2. To choose an emission limit for kiln 2 that is 247% higher than the allowable SO_2 emission limit for kiln 3 based on this uncertainty does not, however, comply with the "top-down" BACT approach. If the SO_2 removal inherent in kilns 2 and 3 are similar when burning oil or gas, why would it not be expected that the SO_2 removals when burning coal would be similar? Regarding the use of lower sulfur coal, we find the estimated cost of between $983-$1,784 per ton of SO_2 removed to be reasonable. The 730 ton per year reduction in SO_2 by utilizing 1% sulfur coal is a significant reduction in annual emissions. Futhermore, although the amount of data contained in the BACT/LAER Clearinghouse is limited for this source type, coal of 1% sulfur (annual average) has been required as BACT from as early as 1978. KBN's conclusory statements about the competitive nature of the open market for their product should be supported by showing that no PSD cement plants were required to use low sulfur coal and/or oil/gas as fuel. This information, coupled with an examination of the fuels from non-PSD cement kilns, would support KBN's statements.

If you have any questions concerning this letter, please contact Mark Armentrout of my staff at (404) 347-2864.

Sincerely yours,

Bruce P. Miller

Bruce P. Miller, Chief
Air Programs Branch
Air, Pesticides, and Toxics
Management Division

They're just playing back my original interp of "Capable of accomodating" for Fla Pwr Corp - BT

Copied: J. Reynolds
B. Andrews
M. Linn

J. Goldman, SE Dist
P. Wong, DERM
C. Shaver, NPS
CHF/BT
C. Buff, KBN

November 20, 1989

Mr. C.H. Fancy, P.E.
Bureau of Air Regulation
Florida Department of Environmental Regulation
2600 Blair Stone Road
Tallahassee, FL 32399-2400

Re: Proposed Modification--Kiln 2 Coal Conversion
PSD-FL-142 - AC13-169901

Dear Mr. Fancy:

As requested, we are providing you four additional copies of the above-referenced report.

If you have any questions concerning this submittal, please call Mr. David A. Buff, P.E., at 904-331-9000.

Sincerely,

David A. Buff

David A. Buff, M.E., P.E.
Principal Engineer

DAB:tyf

89025C1/2

KBN ENGINEERING AND APPLIED SCIENCES, INC.
1034 Northwest 57th Street Gainesville, Florida 32605 904/331-9000 FAX: 904/332-4189

METROPOLITAN DADE COUNTY, FLORIDA

METRO-DADE

METRO-DADE CENTER

ENVIRONMENTAL RESOURCES MANAGEMENT
SUITE 1310
111 N.W. 1st STREET
MIAMI, FLORIDA 33128-1971
(305) 375-3376

November 17, 1989

Clair Fancy, P.E.
Bureau of Air Regulation
Florida Department of Environmental Regulation
2600 Blair Stone Road
Tallahassee, Florida 33299

RE: Tarmac Florida, Inc., Proposed Modification Kiln 2 Coal Conversion,
PSD FL-142, AC13-169901

Dear Mr. Fancy:

We have reviewed the subject application submitted by Tarmac Florida, Inc., for the conversion of Kiln #2 to coal fuel. We offer the following comments:

DERM fully supports EPA's position on this application as outlined in Bruce Miller's October 18, 1989 letter to Patricia Adams of your office. Of major significance is the position stated that baseline emissions needs to be recalculated using a two year average of actual emissions. Also, the increase in fugitive emissions from additional stockpiling and handling of coal fuel should be accounted for in the calculations, specifically in relation to potential impact on the nearby Class I area.

In regards to Sulphur Dioxide emissions, Dade County standards are as follows:

1. Ambient Air Quality Standards
   a. Annual Arithmetic Mean
      25 micrograms per cubic meter

   b. Twenty-four Hour Concentration
      110 micrograms per cubic meter

   c. Three-Hour Concentration
      350 micrograms per cubic meter

2. Emission Standards
   Stationary combustion source solid fuel with two-hundred-fifty million or less BTU per hour heat input 1.5 pound per million BTU heat input.

This application should demonstrate the sources ability to meet these standards.

We look forward to receiving a copy of the amended application for further review.

Sincerely,

Ewart Anderson

Ewart L. Anderson, P.E.
Air Permitting Engineer
Environmental Monitoring Division

cc: J. Reynolds
B. Andrews
M. Linn
H. Aronson, EPA
C. Shaver, NPS
I. Goldman, SE Dist
BT

ELA/aas

STACK TEST RESULTS SUMMARY - UNIT I KILN
FLORIDA CRUSHED STONE

TEST DATE		Part lbs/hr	SO2 lbs/hr	NOx lbs/hr	CO lbs/hr	THC lbs/hr	NOTES
	permit allowable	**49.5**	**50.0**	**359.0**	**127.0**	**6.35**	-
08/20/90	test 1	23.03	7.16	378.1			coal only
	test 2	23.12	1.74	560.8			NOx failed stack test
	test 3	16.03	1.78	447.5			
	avg.	**20.73**	**3.56**	~~**462.1**~~			
03/02/91	test 1	18.69	7.81	66.9			coal only
	test 2	22.44	3.51	59.4			NOx measured on CEM
	test 3	31.47	4.37	152.6			Method 7E
	avg.	**24.2**	**5.23**	**92.9**			
11/13/91	test 1	25.14		434	63.5	3.5	coal only
	test 2	10.75		240	55	3.4	
	test 3	11.96		384	56.9	3.9	
	avg.	**11.36**		**353**	**58.6**	**3.6**	
	test 1	10		210.6	74.2	1.15	coal & TDF
	test 2	9.07		174.6	90.4	1.31	
	test 3	0.76		212.3	75.2	1.2	
	avg.	**9.61**		**199.1**	**79.9**	**1.22**	
02/11/92	test 1		2.26				coal only
	test 2		3.8				
	test 3		3.61				
	avg.		**3.22**				
03/16/93	test 1	1.36	4.6	222.9			coal & TDF burned
	test 2	2.51	3.3	212.3			NOx measured on CEM
	test 3	1.49	3.4	207.8			Method 7E
	avg.	~~**1.79**~~	**3.8**	**214.3**			
06/01/94	test 1	10.31	4.39	200.1			coal & TDF burned
	test 2	11.36	3.5	170.2			NOx measured on CEM
	test 3	8.76	3.47	306.7			Method 7E
	avg.	**10.14**	**3.79**	**225.7**			
Average		15.21	3.92	235.58			

83 tons clinker per Hour

127 Kiln feed rate

Sent with R.P. or alone -

Kanani. I'm sure Teresa talked with you about this item. Below is what I have already done on item 16. Just see what you can fill in and we can discuss on Wednesday. Please do it on All-in-One so I can insert this back into my Interrogatories. On permit numbers, reference the current AO's. On BACT determinations, indicate the PSD numbers. Tarmac had a BACT on Kiln 3 related to a conversion to coal in 1980 or so under the name Maule or Pennsucco. They also had a BACT on Kiln 2 related to a coal conversion. FCS had a BACT in Mid-80's. Southdown used to be Florida Mining and Materials and had some BACT determinations in the 90's. There were several changes in those numbers. Be prepared to lay the whole set of files out in conference room table and we will do this together if you get hung up.

16. Rinker

(a) Rinker Materials Corporation. Cement mill at 1200 N.W. 137th Avenue, Miami, Florida 33182. Portland Cement Plant

0250014
Mike Vardeman
305-229-2955
Facility Contact

(b) AC13-213153 Firing of Whole Tires Issue
AC13-187599 Decontamination of Soil
AO13-172954
2 Kilns

(c) No BACT determinations.

Wet? fuel

(d) Coal 60 % (variable)
Tires 5 (none recently)
Gas 10 (variable)
Oil 35 (difference)

Recycled

(e) All CKD is returned to the process. Historically they had removed as much as 5-10,000 tons per year (TPY).

Tarmac

(a) Tarmac America, Inc. Cement plant at 11000 N.W. 121 Way, Medley, Florida 33178.

0250020
Scott Quaas
305-481-2800

(b) AC13-027742
PSD-FL-50
PSD-FL-50A

(c) BACT Limits 4/7/80

Wet?

Kiln #	Fuel	Particulate (TPY)	SO2 (TPY)	NO (TPY)
1 & 2	COAL	24966	248.4	185.3
1 & 2	GAS	24966	19.7	741.3
1 & 2	OIL	24966	198.6	491.3
3	COAL	87381	115.1	648.7
3	GAS	87381	10.3	2474.7
3	OIL	87381	95.9	1638.1

Kiln # 1 SO2 1.42 lb/ton dry feed, not to exceed 56.7 lb/hr
Kiln # 2 SO2 1.42 lb/ton dry feed, not to exceed 56.7 lb/hr

See JR

Rinker - Cement plant constructed mid-1950's

Tarmac -

TARMAC con't

Kiln # 3 SO2 0.19 lb/ton dry feed, not to exceed 56.7 lb/hr

1985 Amendment to BACT
Combination Firing of Kilns # 1-3

SO2 (lb/hr)

	Kiln # 1	Kiln # 2	Kiln # 3
A.)	Coal - 125	Gas - 9	Coal - 400
B.)	Gas - 9	Coal - 125	Coal - 400
C.)	Coal - 125	Coal - 125	-shutdown-

PSD-FL-142 Issued 2-25-91 Kiln # 2

Pollutant	Limit (lb/MMBTU)	Equivalent (lb/ton clinker produced)
SO2	1.20	7.80
NOx	0.70	4.55
H2SO4	0.036	0.23

Fuel (d) Coal 100 % (during full production)
Oil (during startup and shutdown)
Waste Oil (generated on-site)

Recycle (e) Over 50 percent of CKD is returned to the process.

Southdown (Florida Mining and Materials) ~~AIRS ID~~ ~~0050001~~ 3

(a) Florida Mining and Materials. No.2 Cement Kiln at U.S. Highway 98 (North) (P.O. Box 6) NW of Brooksville, Florida 33512.

Dry (b) 1. PSD-FL-124 AC27-138850
2. PSD-FL-124A AC27-173474 Maximum Allowables
3. PSD-FL-188 AC27-212252 NOx Increase

~~Annie Corrales~~ 8/13/93

Preheater (c) Kiln # 2 (from 1.)
SO2 120 lbs/hr
NOx 250 lbs/hr

0530010

Pollutant	Limit (lbs/hr)	TPY
PM	21.6	85.3
SO2	12.0	47.4
NOx	250.0	987.0 1025.0
VOC	2.7	10.7
CO	8.9	35.1
VE	< 10% Opacity	

~~Don B.~~

Matt Stone
Facility Contact
352-796-7241

Kiln # 2 (from 3.)
(Based on 2. except NOx increase)

Pollutant	Maximum allowables (lbs/hr)	TPY
PM	13.5	85.3
SO2	11.5	47.4
NOx	250.0, 30 day average	987.0
VOC	7.4	10.7
CO	64.0	35.1
VE	< 10% Opacity	

Product : Portland Cement

Kiln #2 (from BACT, 6/5/80)

	lb/hr	ton/year	Opacity
Particulate	24.0	94.8	10%
NOx	195.3	770.8	

A 0.2 lb/ton particulate emission limiting rate is used for calculating the kiln emsission limit, based on the applicant's test average of 0.141 lb/ton kiln feed.

Fuel

(d) Fuel Input (from 1.):
213.6 MMBtu/hr (coal of 12000 BTU/lbs heating value)
S < 1% by weight

Recycle

(e) All CKD from air pollution control equipment is returned to process. CKD from kiln bypass (roughly 5 percent compared to control equipment catch) is sold.

Florida Crushed Stone

(a) Florida Crushed Stone Company. Cement plant at 10311 Cement Plant Road, Brooksville, Florida 34601.

(b) PSD-FL-90
PSD-FL-91 (90A, 90B, 90C, & 90D)
AC27-061016
AC27-118674

Kiln #1

Dry

(c)

Pollutant	lb/ton of kiln of feed	max allowable lb/hr	max allowable TPY
PM	0.3	37.1	162
SO2	0.6	74.3	325
NOx	2.9	359.0	1572

Preaheater #1

From BACT PSD-FL-91

Preheater Precalciner

Particulate	0.3 l/ton dry feed
VOC	10% Opacity
SO2	0.6 lb/ton dry feed
NOx	2.9 lb/ton dry feed

Fuel

(d) Coal 85 %
Tires 15
Diesel (during warmup - roughly 121,000 gal/year)

Coal consumption 10.3 tons per hour @ max
9.25 tons per hour average firing

Fossil fuels must be the only fuels fired (PSD-FL-91)
Maximum Heat Input 248 MMBtu/hr
Maximum Production 75 ton clinker/hr

Recycle

(e) Over 95 percent of CKD is returned to the process. The rest is

Product: Portland Cement

sold. Add

FCS Kiln #2

See PD for lb/ton feed

0530021-001-AC

Tom Mountain -Facility Contact

Env. Manager

352-799-7881

TARMAC 94-93

DEPARTMENT OF ENVIRONMENTAL PROTECTION
AIR RESOURCES MANAGEMENT SYSTEM
FACILITY EMISSION REPORT

11-SEP-96 Page:1

AIRS ID: 0250020 # of Emissions Unit: 19
Owner: TARMAC FLORIDA
Name: TARMAC FLORIDA
City: MEDLEY Office: SEDA County: DADE
Status: A Compliance Tracking Code: A DFC: 22-SEP-95
SIC: 3241 PSD: Y PPS: N NSPS: Y NESHAP:
Title V Source: Y Syn Non-Title V Source: Small Business Stationary:
Major of HAPS: Y Major of Non-HAP Pollutants:
Syn Minor of HAPS: Syn Minor of Non-HAP Pollutants:

E.U. 1 Desc: 41 TPH KILN#1 W/ELECTROSTATIC PRECIPITATOR

Pollutant	Poten(TPY)	Allow(TPY)	1994 Actual(TPY)	1993 Actual(TPY)
SO2		520.0000		
PM		110.0000		
NOX				
PM10				
PB				

E.U. 2 Desc: 25 TPH COOLER 1 W/MULTICLONE& DOUBLE CHAMBER E.S.P

Pollutant	Poten(TPY)	Allow(TPY)	1994 Actual(TPY)	1993 Actual(TPY)
PM		110.0000		
PM10				

E.U. 3 Desc: 23 TON MILL FOR 23 TPH COAL HANDLING SYSTEM

Pollutant	Poten(TPY)	Allow(TPY)	1994 Actual(TPY)	1993 Actual(TPY)
PM	13.5000	13.5000		16.2000

E.U. 4 Desc: 41 TPH KILN #2 W/DOUBLE CHAMBER E.S.P.

Pollutant	Poten(TPY)	Allow(TPY)	1994 Actual(TPY)	1993 Actual(TPY)
VOC	113.5000	113.5000		
SO2	768.7000	768.0000		
SAM	23.1000	23.1000		
PM	56.7600	56.7600		34.3000
PM10	48.3000	48.3000		
PB				
NOX	524.5000	524.5000		
CO	1363.9000	1363.9000		

E.U. 5 Desc: 25 TPH COOLER #2 W/MULTICLONE & DUAL CHAMBER E.S.P

Pollutant	Poten(TPY)	Allow(TPY)	1994 Actual(TPY)	1993 Actual(TPY)
PM	56.8000	56.8000		95.3000
PM10				

E.U. 6 Desc: 142 TPH KILN #3 W/DROPOUT BOX& DUAL CHAMBER E.S.P.

Pollutant	Poten(TPY)	Allow(TPY)	1994 Actual(TPY)	1993 Actual(TPY)
SO2	1752.0000	1752.0000		1322.4000
PM	186.1500	186.1500		14.1000
NOX	2592.9600	2592.9600		1345.6000
PM10				
PB				

E.U. 7 Desc: 88 TPH COOLER#3 W/DROPOUT BOX & BAGHOUSE

Pollutant	Poten(TPY)	Allow(TPY)	1994 Actual(TPY)	1993 Actual(TPY)
PM	62.1900	62.1900		6.0000
PM10				

E.U. 8 Desc: CLINKER HANDLING &STORAGE SYSTEM FOR KILNS #1&2(AC

Pollutant	Poten(TPY)	Allow(TPY)	1994 Actual(TPY)	1993 Actual(TPY)
PM	1.0950			1.0000

E.U. 9 Desc: CLINKER HANDLING &STORAGE SYSTEM FOR KILN #3

Pollutant	Poten(TPY)	Allow(TPY)	1994 Actual(TPY)	1993 Actual(TPY)
PM	4.9050			3.1000

E.U. 10 Desc: 25 TPH FINISH MILL #1 W/AIRSLIDE,CONVEYOR & BGHS

Pollutant	Poten(TPY)	Allow(TPY)	1994 Actual(TPY)	1993 Actual(TPY)
PM	115.6300	115.6300		3.1000
PM10				
PB				

E.U. 11 Desc: 2 STPH FINISH MILL #2 W/AIRSLIDE,CONVEYOR& BGHS

Pollutant	Poten(TPY)	Allow(TPY)	1994 Actual(TPY)	1993 Actual(TPY)
PM	104.0000	104.0000		2.7000
PM10				
PB				

E.U. 12 Desc: 84 TPH FINISH MILL #3 W/AIRSLIDE,CONVEYOR &BGHS

Pollutant	Poten(TPY)	Allow(TPY)	1994 Actual(TPY)	1993 Actual(TPY)
PM	153.9100	153.9100		5.6000
PM10				
PB				

E.U. 13 Desc: 113 TPH FINISH MILL #4 W/AIRSLIDE,CONVEYOR &BGHS

Pollutant	Poten(TPY)	Allow(TPY)	1994 Actual(TPY)	1993 Actual(TPY)
PM	161.4900	161.4900		3.2000
PM10				
PB				

E.U. 14 Desc: CEMENT STORAGE SILOS #1-12 SERVING MILLS#1-4

Pollutant	Poten(TPY)	Allow(TPY)	1994 Actual(TPY)	1993 Actual(TPY)
PM	17.2500	17.0000		11.2000

E.U. 15 Desc: CEMENT DISTRIBUTION-RAIL AND TRUCK LOADOUTS

Pollutant	Poten(TPY)	Allow(TPY)	1994 Actual(TPY)	1993 Actual(TPY)
PM	5.0000	5.0000		1.4000
PM10				

E.U. 16 Desc: CEMENT DISTRIBUTION-PACKHOUSE W/2 BAGGERS

Pollutant	Poten(TPY)	Allow(TPY)	1994 Actual(TPY)	1993 Actual(TPY)
PM	6.0000	6.0000		1.8000
PM10				

E.U. 17 Desc: 15 TON MILL FOR COAL HANDLING SYSTEM FOR KILN #2.

Pollutant	Poten(TPY)	Allow(TPY)	1994 Actual(TPY)	1993 Actual(TPY)
PM	9.2000	9.2000		

E.U. 18 Desc: FEEDBIN AND ELEVATOR FOR 23 TPH COAL HANDLING SYST.

Pollutant	Poten(TPY)	Allow(TPY)	1994 Actual(TPY)	1993 Actual(TPY)
PM	1.3140	1.3140		
PM10				

E.U. 19 Desc: HOPPER AND WEIGHT FEEDER FOR 23 TPH COAL HANDLING

Pollutant	Poten(TPY)	Allow(TPY)	1994 Actual(TPY)	1993 Actual(TPY)
PM	1.3140	1.3140		
PM10				

REPORT OPTIONS

AIRS ID	:	0250020
COUNTY	:	%
OFFICE	:	%
FACILITY STATUS	:	%
SORT ORDER	:	A
TITLE V	:	%
YEAR	:	1994
FACILITY SIC	:	%
COMPLIANCE TRACKING CODE	:	%

TARMAC

REPORT OPTIONS

AIRS ID	:	0250020
COUNTY	:	%
OFFICE	:	%
FACILITY STATUS	:	%
SORT ORDER	:	A
TITLE V	:	%
YEAR	:	1992
FACILITY SIC	:	%
COMPLIANCE TRACKING CODE	:	%

TARMAC

E.U. 13 Desc: 113 TPH FINISH MILL #4 W/AIRSLIDE,CONVEYOR &BGHS

Pollutant	Poten(TPY)	Allow(TPY)	1992 Actual(TPY)	1991 Actual(TPY)
PM	161.4900	161.4900	2.1000	6.5000
PM10				
PB				

E.U. 14 Desc: CEMENT STORAGE SILOS #1-12 SERVING MILLS#1-4

Pollutant	Poten(TPY)	Allow(TPY)	1992 Actual(TPY)	1991 Actual(TPY)
PM	17.2500	17.0000	9.2000	7.1000

E.U. 15 Desc: CEMENT DISTRIBUTION-RAIL AND TRUCK LOADOUTS

Pollutant	Poten(TPY)	Allow(TPY)	1992 Actual(TPY)	1991 Actual(TPY)
PM	5.0000	5.0000	1.3000	1.2000
PM10				

E.U. 16 Desc: CEMENT DISTRIBUTION-PACKHOUSE W/2 BAGGERS

Pollutant	Poten(TPY)	Allow(TPY)	1992 Actual(TPY)	1991 Actual(TPY)
PM	6.0000	6.0000	1.2000	1.0000
PM10				

E.U. 17 Desc: 15 TON MILL FOR COAL HANDLING SYSTEM FOR KILN #2.

Pollutant	Poten(TPY)	Allow(TPY)	1992 Actual(TPY)	1991 Actual(TPY)
PM	9.2000	9.2000		

E.U. 18 Desc: FEEDBIN AND ELEVATOR FOR 23 TPH COAL HANDLING SYST

Pollutant	Poten(TPY)	Allow(TPY)	1992 Actual(TPY)	1991 Actual(TPY)
PM	1.3140	1.3140		
PM10				

E.U. 19 Desc: HOPPER AND WEIGHT FEEDER FOR 23 TPH COAL HANDLING

Pollutant	Poten(TPY)	Allow(TPY)	1992 Actual(TPY)	1991 Actual(TPY)
PM	1.3140	1.3140		
PM10				

DEPARTMENT OF ENVIRONMENTAL PROTECTION
AIR RESOURCES MANAGEMENT SYSTEM
FACILITY EMISSION REPORT

AIRS ID: 0250020 # of Emissions Unit: 19
Owner: TARMAC FLORIDA
Name: TARMAC FLORIDA
City: MEDLEY Office: SEDA County: DADE
Status: A Compliance Tracking Code: A DFC: 22-SEP-95
SIC: 3241 PSD: Y PPS: N NSPS: Y NESHAP:
Title V Source: Y Syn Non-Title V Source: Small Business Stationary:
Major of HAPS: Y Major of Non-HAP Pollutants:
Syn Minor of HAPS: Syn Minor of Non-HAP Pollutants:

E.U. 1 Desc: 41 TPH KILN#1 W/ELECTROSTATIC PRECIPITATOR

Pollutant	Poten(TPY)	Allow(TPY)	1992 Actual(TPY)	1991 Actual(TPY)
SO2		520.0000		
PM		110.0000		
NOX				
PM10				
PB				

E.U. 2 Desc: 25 TPH COOLER 1 W/MULTICLONE& DOUBLE CHAMBER E.S.P

Pollutant	Poten(TPY)	Allow(TPY)	1992 Actual(TPY)	1991 Actual(TPY)
PM		110.0000		
PM10				

E.U. 3 Desc: 23 TON MILL FOR 23 TPH COAL HANDLING SYSTEM

Pollutant	Poten(TPY)	Allow(TPY)	1992 Actual(TPY)	1991 Actual(TPY)
PM	13.5000	13.5000	15.9000	12.5000

E.U. 4 Desc: 41 TPH KILN #2 W/DOUBLE CHAMBER E.S.P.

Pollutant	Poten(TPY)	Allow(TPY)	1992 Actual(TPY)	1991 Actual(TPY)
VOC	113.5000	113.5000		
SO2	768.7000	768.0000		
SAM	23.1000	23.1000		
PM	56.7600	56.7600	35.4000	
PM10	48.3000	48.3000		
PB				
NOX	524.5000	524.5000		
CO	1363.9000	1363.9000		

E.U. 5 Desc: 25 TPH COOLER #2 W/MULTICLONE & DUAL CHAMBER E.S.P

Pollutant	Poten(TPY)	Allow(TPY)	1992 Actual(TPY)	1991 Actual(TPY)
PM	56.8000	56.8000	26.5000	
PM10				

E.U. 6 Desc: 142 TPH KILN #3 W/DROPOUT BOX& DUAL CHAMBER E.S.P.

Pollutant	Poten(TPY)	Allow(TPY)	1992 Actual(TPY)	1991 Actual(TPY)
SO2	1752.0000	1752.0000	662.7000	566.6000
PM	186.1500	186.1500	105.8000	23.4200
NOX	2592.9600	2592.9600	1738.1000	1528.6000
PM10				
PB				

E.U. 7 Desc: 88 TPH COOLER#3 W/DROPOUT BOX & BAGHOUSE

Pollutant	Poten(TPY)	Allow(TPY)	1992 Actual(TPY)	1991 Actual(TPY)
PM	62.1900	62.1900	35.0000	72.9200
PM10				

E.U. 8 Desc: CLINKER HANDLING &STORAGE SYSTEM FOR KILNS #1&2(AC

Pollutant	Poten(TPY)	Allow(TPY)	1992 Actual(TPY)	1991 Actual(TPY)
PM	1.0950		0.5000	

E.U. 9 Desc: CLINKER HANDLING &STORAGE SYSTEM FOR KILN #3

Pollutant	Poten(TPY)	Allow(TPY)	1992 Actual(TPY)	1991 Actual(TPY)
PM	4.9050		3.0000	2.9000

E.U. 10 Desc: 25 TPH FINISH MILL #1 W/AIRSLIDE,CONVEYOR & BGHS

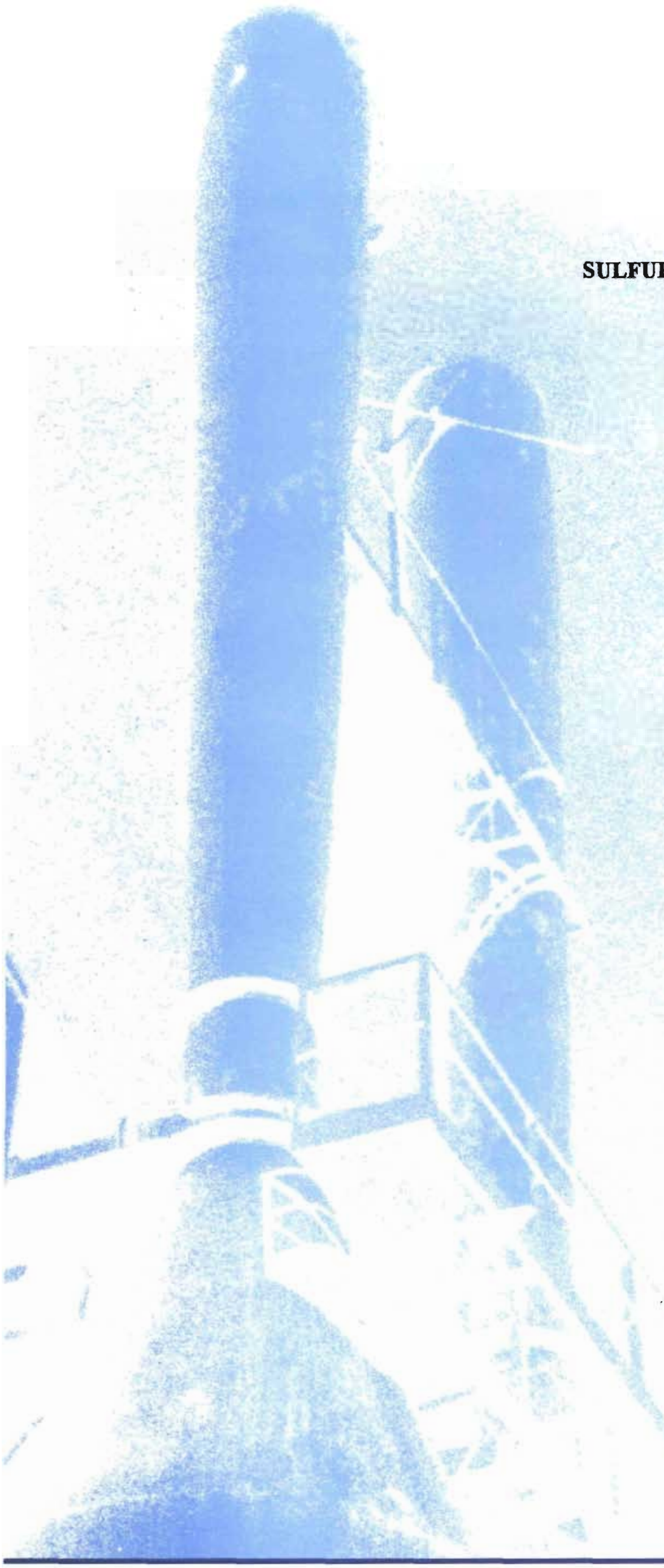
Pollutant	Poten(TPY)	Allow(TPY)	1992 Actual(TPY)	1991 Actual(TPY)
PM	115.6300	115.6300	1.9000	1.6000
PM10				
PB				

E.U. 11 Desc: 2 STPH FINISH MILL #2 W/AIRSLIDE,CONVEYOR& BGHS

Pollutant	Poten(TPY)	Allow(TPY)	1992 Actual(TPY)	1991 Actual(TPY)
PM	104.0000	104.0000	2.6000	1.4000
PM10				
PB				

E.U. 12 Desc: 84 TPH FINISH MILL #3 W/AIRSLIDE,CONVEYOR &BGHS

Pollutant	Poten(TPY)	Allow(TPY)	1992 Actual(TPY)	1991 Actual(TPY)
PM	153.9100	153.9100	5.2000	4.2000
PM10				
PB				



SOURCE TEST REPORT
FOR
SULFUR DIOXIDE, ACID MIST, AND OXIDES OF NITROGEN

CEMENT KILN 2 - COAL CONVERSION
ELECTROSTATIC PRECIPITATOR OUTLET

TARMAC FLORIDA, INC.
MEDLEY, FLORIDA

FDEP PERMIT NUMBER A013-238048
I.D. NUMBER 50/DAD/13/0020
FDEP PERMIT NUMBER AC13-169901
PSD-FL-142

MAY 31, 1995

PREPARED FOR:

TARMAC FLORIDA, INC.
455 FAIRWAY DRIVE
DEERFIELD BEACH, FLORIDA 33441

PREPARED BY:

AIR CONSULTING AND ENGINEERING, INC.
2106 NW 67TH PLACE, SUITE 4
GAINESVILLE, FLORIDA 32606

247-95-02

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ACE
AIR CONSULTING
& ENGINEERING, INC.
2106 N.W. 67th Place • Suite 4 • Gainesville, Florida • 32606
(904) 335-1889 FAX (904) 335-1891

REPORT CERTIFICATION

To the best of my knowledge, all applicable field and analytical procedures comply with Florida Department of Environmental Protection requirements and all test data and plant operating data are true and correct.

Stephen L. Neck

Stephen L. Neck, P.E.

July 12, 1995

Date

STEPHEN L. NECK, P.E.
CERTIFICATE
NO. 20...
FLORIDA
REGISTERED ENGINEER

1.0 INTRODUCTION

On May 31, 1995, Air Consulting and Engineering , Inc. (ACE) conducted Sulfur Dioxide (SO_2), acid mist, and Oxides of Nitrogen (NO_x) emissions testing on the outlet stack of Cement Kiln 2 at Tarmac Florida, Inc. in Medley, Florida.

Kiln 2 was tested in accordance with Florida Department of Environmental Protection (FDEP) Permit Number AC13-169901 while firing coal.

Testing was performed using United States Environmental Protection Agency (EPA) Method 8 SO_2, acid mist and SO_3, and EPA Method 7E NO_x.

Mr. Scott Quaas of Tarmac coordinated testing and provided production data. He also performed the opacity test.

Messrs Frank Delgado and Marc Le'Veille' of Dade County Department of Environmental Resource Management (DERM) witnessed testing.

2.0 SUMMARY AND DISCUSSION OF RESULTS

Table 1 summarizes the emission results and flue gas parameters. During the testing effort, the kiln was fired with coal.

Oxides of nitrogen emissions averaged 328.4 pounds per hour (lbs/Hr).

The SO_2 and acid mist averaged 4.43 and 2.27 lbs/Hr, respectively. The value reported as acid mist was probably all SO_3 as no acid mist was detected prior to first filter (see Section 5.0) in the EPA Method 8 train.

Complete emission summaries, field data, laboratory data, and strip chart copies are presented in Appendices A, B, C, and D, respectively.

Table 1 Emission Summary
Tarmac Florida, Inc.
Kiln 2 ESP Outlet
Medley, Florida
May 31, 1995

Run Number	Time	Flow Rate SCFMD	NOx Emissions ppm	NOx Emissions lbs/Hr	SO2 Emissions lbs/Hr	Acid Mist Emissions lbs/Hr
1	1055-1206	52185	923	345.1	4.23	5.93
2	1259-1408	51010	883	322.7	7.26	0.63
3	1459-1610	53962	821	317.4	1.81	0.25
AVERAGE		52387	876	328.4	4.43	2.27

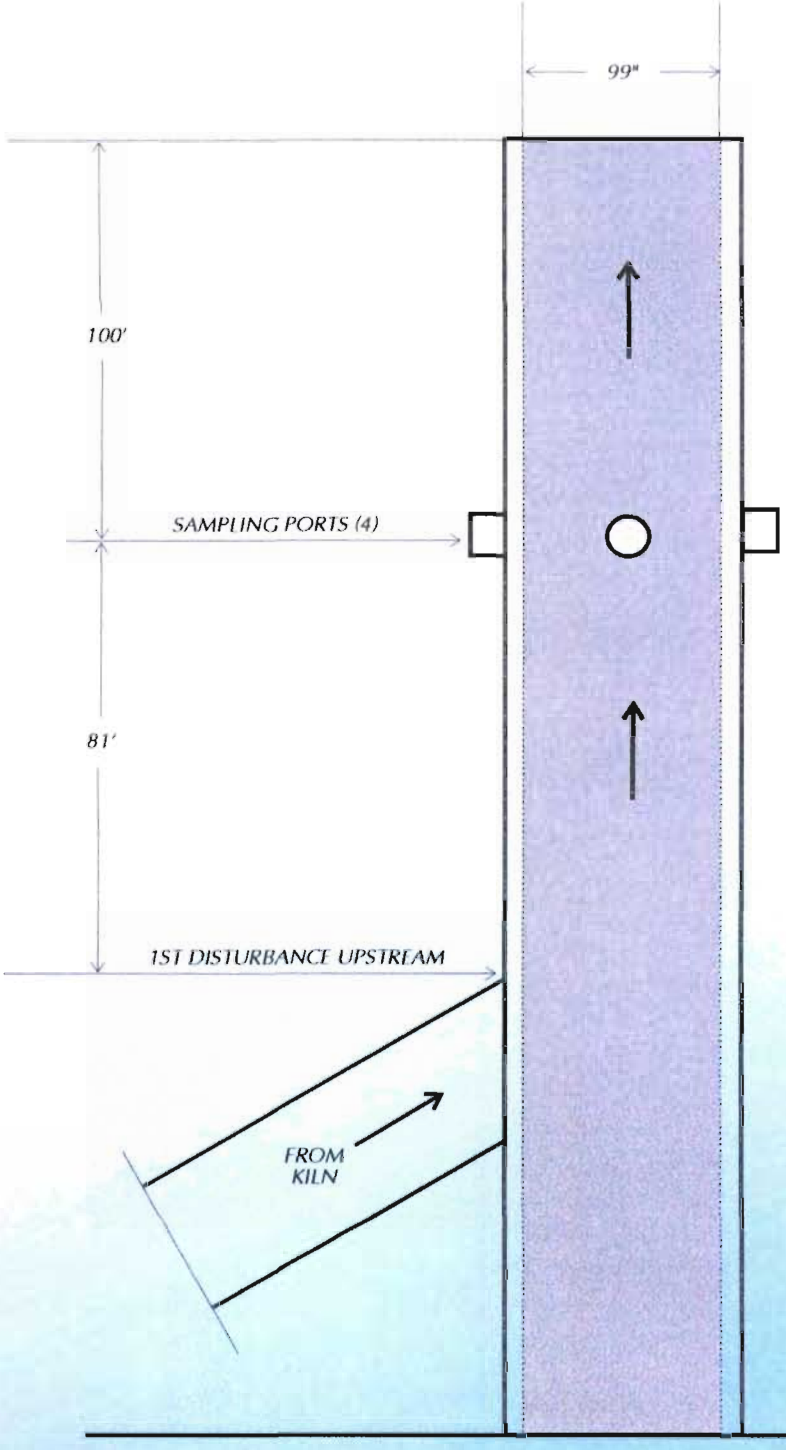
3.0 PROCESS DESCRIPTION AND OPERATION

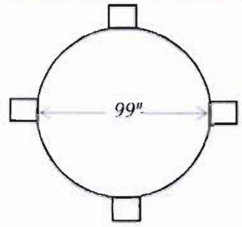
Kiln Systems 1 and 2 contain a common dust insufflation system which can return captured particulate to the kiln firing hoods. The dust handling equipment for the insufflation system includes a surge bin (for each kiln precipitator) and a common dust bin controlled by a baghouse. Kiln 2 has a 40.5 dry tons per hour input capacity and is controlled by a double chambered electrostatic precipitator.

Plant production data sheets are presented in Appendix G.

4.0 SAMPLING POINT LOCATION

The sampling point locations and outlet duct schematic are provided in Figure 1. The outlet stack has 99 inch diameter and four sample ports 90 degrees apart. Six test points per port were sampled for each run. The stack configuration is such that evaluation for the presence of cyclonic flow is not necessary.





TRAVERSE POINT NUMBER	INCHES INSIDE STACK WALL
1	2.1
2	6.6
3	11.7
4	17.5
5	24.8
6	35.3

FIGURE 1.
SAMPLING POINT LOCATION
KILN NO. 2, ESP OUTLET
TARMAC, FLORIDA, INC.
MIAMI, FLORIDA

ACE AIR CONSULTING & ENGINEERING, INC.

5.0 FIELD AND ANALYTICAL PROCEDURES

5.1 Determination of Sulfuric Acid Mist and Sulfur Dioxide Emissions From Stationary Sources--EPA Method 8

SO_2 and acid mist samples were collected by the measurement method specified by the United States Environmental Protection Agency. A schematic diagram of the sampling train used is shown in Figure 2.

PREPARATION OF EQUIPMENT

1. NOZZLE, SAMPLING PROBE, AND FLEXIBLE TEFLON TUBING - The nozzle, sampling probe, and flexible tubing were washed vigorously with soapy water and brushes, rinsed with acetone and distilled water, and dried prior to the test program. All openings on the sampling equipment were sealed while in transit to the test site.

2. IMPINGERS AND FILTER HOLDER - The Greenburg-Smith impingers and filter holder were cleaned with a warm soapy water solution and brushes, rinsed with distilled water and acetone, and dried. The impingers and filter holder were sealed tightly during transit.

TEST PROCEDURE

Prior to performing the actual Method 8 sample runs, certain stack and stack gas parameters were measured. These preliminary measurements included the average gas temperature, the stack gas velocity head, the stack gas moisture content, and the stack dimensions at the point where the tests were being performed. The stack gas temperature was determined by using a bi-metallic thermocouple and calibrated pyrometer. Velocity head measurements were made with calibrated type "S" pitot tube and an inclined manometer. Velocity head measurements of 0.05 inches H2O or less were measured utilizing a micromanometer.

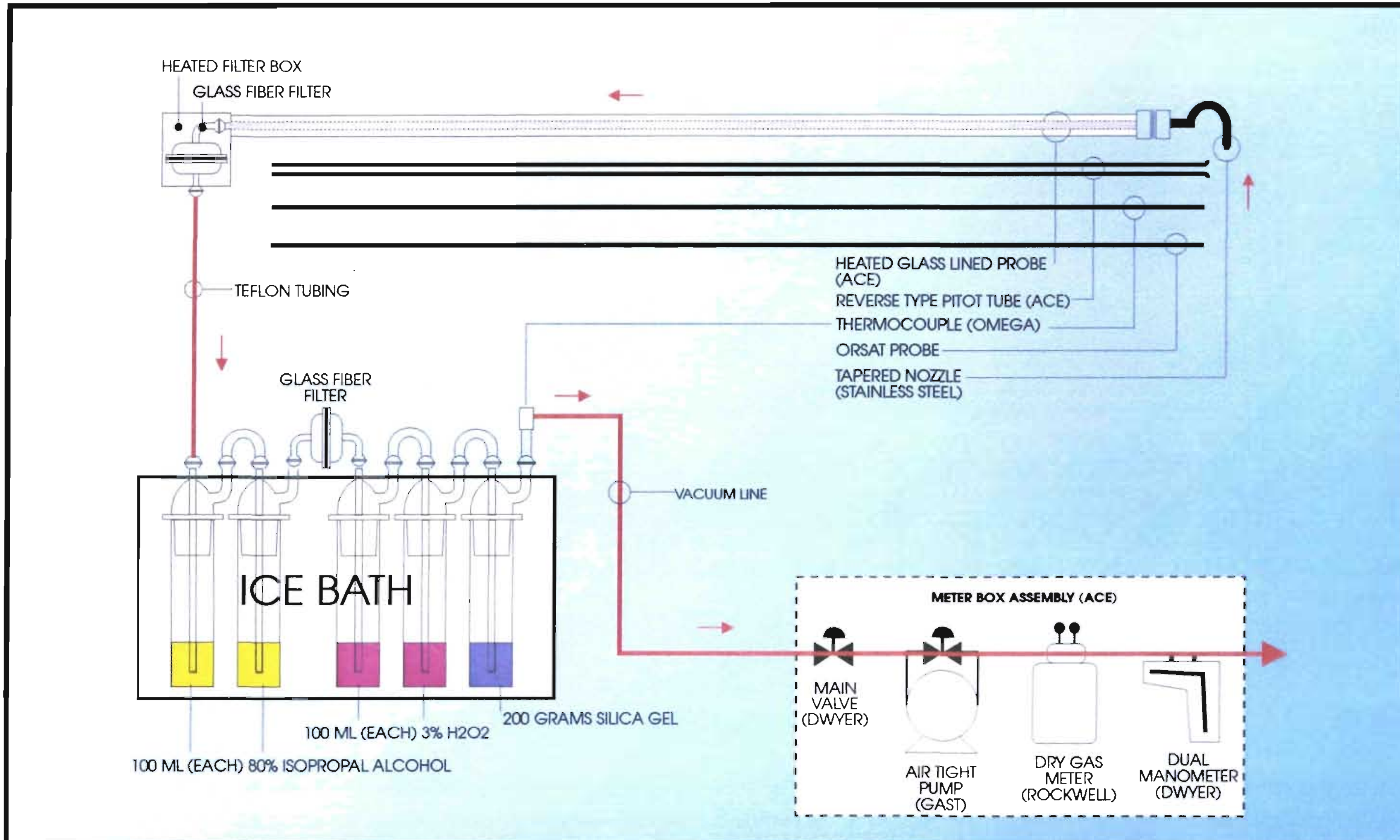


FIGURE 2.

EPA METHOD 8 SAMPLING SCHEMATIC
(SULFURIC ACID MIST AND SULFUR DIOXIDE EMISSIONS)

ACE AIR CONSULTING & ENGINEERING, INC.

The sampling traverse points were selected so that a representative sample could be extracted from the gas stream. The traverse points were located in the center of equal areas, the number of which were dependent upon the distance upstream and downstream from flow disturbances.

Each Method 8 test run consisted of sampling for a specific time at each traverse point. The type "S" pitot tube was connected to the sampling probe so that an instantaneous velocity head measurement could be made at each traverse point while making the test run. The stack gas temperature was also measured at each traverse point. Nomographs were used to calculate the isokinetic sampling rate at each traverse point during each test run.

The gases sampled passed through the following components: a stainless steel nozzle and PYREX glass probe a heated glass fiber filter, flexible TEFLON tubing; two impingers with 100 ml of 80% isopropyl alcohol (ISO); a filter holder with 0.2 micron glass fiber filter; two impingers with 100 ml each of 3% hydrogen peroxide; one impinger with 200 grams of silica gel; a flexible sample line; an air-tight pump; a dry test meter; and a calibrated orifice. The first and third impingers had standard tips, while the second and fourth impingers had modified tips with a 0.5 inch I.D. opening. Following each test run, a leak check was conducted at the maximum vacuum experienced and this value was recorded on the field data sheet. The sample train was then disconnected at the inlet of the first impinger and removed to another area for a fifteen minute purge using ambient air at approximately 0.5 SCFM. A portion of each reagent was retained as a blank solution.

Sample recovery was accomplished by the following procedures:

1. The first filter and acetone probe was were saved for acid mist analysis (Container 1). The second was removed from its holder and placed in Container 2 along with the contents of the first two impingers.

2. All sample-exposed surfaces prior to the filter were washed with 80% ISO and placed in Container 1, sealed and the liquid level marked.

3. The contents and distilled water washings of the third and fourth impingers placed in container 2 and the liquid level was marked.

4. The used silica gel from the fourth impinger was transferred to the original tared container and sealed.

SAMPLE ANALYSES

Liquid levels were checked to assure no sample loss. Samples were thoroughly mixed and analyses begun. The analysis consists of a barium perchlorate titration procedure using thorin indicator for endpoint determination. The barium perchlorate was standardized using a 0.01 normal sulfuric acid solution. A minimum of two titrations were made that agreed within 1%. The titration was made into a 250 ml Erlenmeyer flask that contained the sample aliquot diluted to a 20/80 proportion with isopropyl alcohol. Four drops of thorin indicator were added to the solution. Blanks were titrated in the same manner as the samples.

5.2 Determination of Nitrogen Oxides Emissions from Stationary Sources (Instrumental Analyzer Procedure)--EPA Method 7E

The sampling system is shown in Figure 3. A sample was drawn from the stack at a rate of approximately 2 SCFH. A stainless steel probe and filter assembly was followed by a three-way stainless steel valve. The sample was pumped through a non-heated 1/4" O.D. TEFLON sampling line and condensate trap housed in an ice bath. Calibration gases were introduced at the sampling interface (the three way valve) through another 1/4" O.D. TEFLON line that was not heated. The sample pump delivered gases to a manifold system where one stream was sent to a Thermo Electron Model 10AR Chemiluminescent Analyzer, converted to nitric oxide, reacted with ozone, and a chemiluminescent response measured by a photomultiplier. A second stream was delivered to a Teledyne 320P O2 analyzer. A third stream was dumped to the ambient air. All instrument responses were recorded on strip chart recorders. The sampling system yields NOx and O2 concentrations on a dry basis.

All calibration gases were certified NBS traceable.

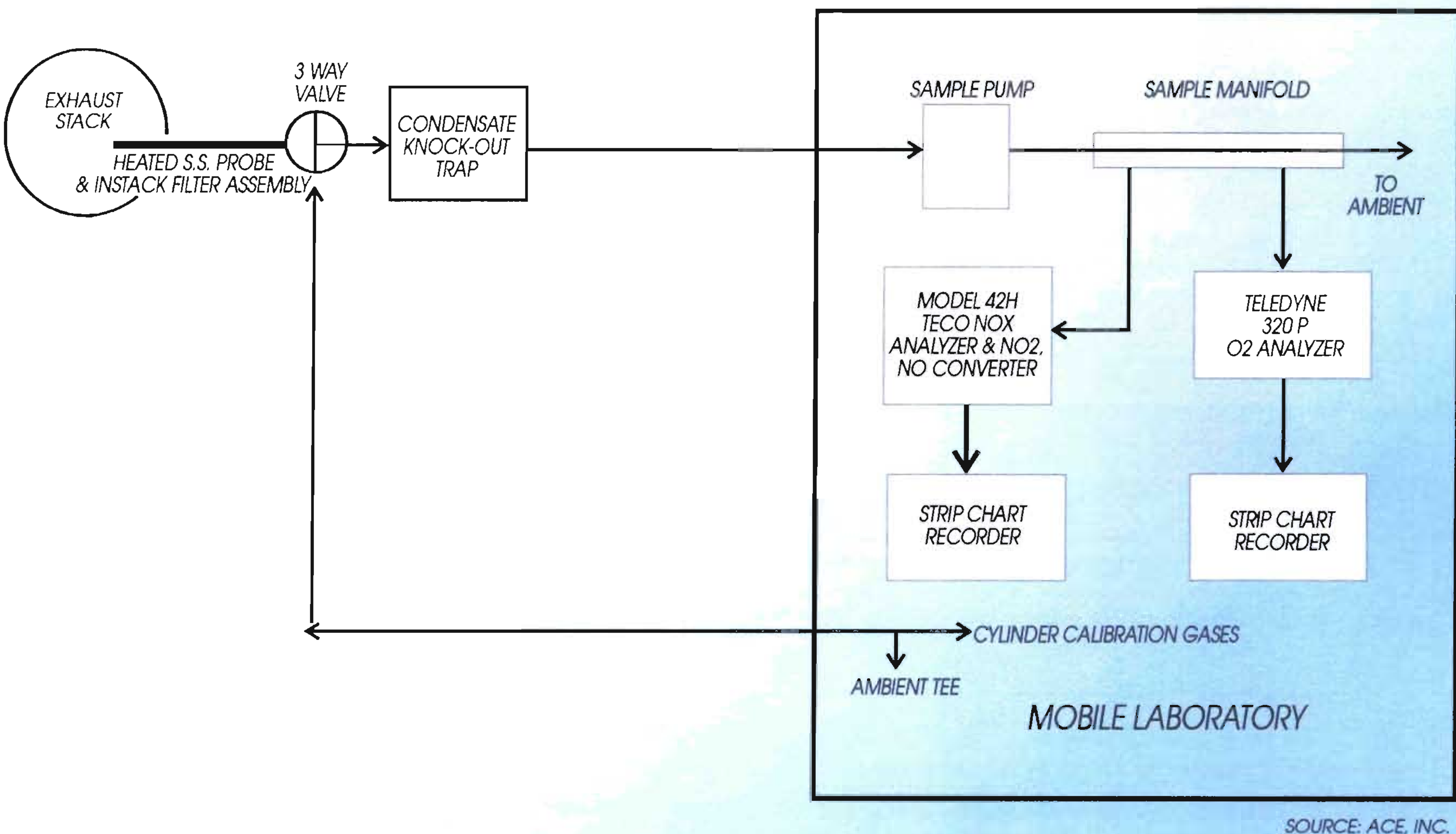


FIGURE 3.

EPA METHOD 7E SAMPLING SCHEMATIC
NITROGEN OXIDE EMISSIONS AND PERCENT OXYGEN

APPENDIX A

COMPLETE EMISSION SUMMARY

NOx EMISSION SUMMARY
TARMAC FLORIDA, INC.
K-2 KILN OUTLET
MEDLEY, FLORIDA
MAY 31, 1995

RUN NUMBER:	1	2	3
TIME:	1056-1207	1259-1401	1459-1605
DATA LOGGER NOx PPM:	937	908.1	836.2
DATA LOGGER O2%:	10.71	11.34	11.2
NOx INITIAL BIAS:	481	473	468.8
NOx FINAL BIAS:	473	496.9	490.8
NOx AVERAGE BIAS:	477	484.95	479.8
O2 INITIAL BIAS:	20.93	20.93	20.88
O2 FINAL BIAS:	20.93	21.36	20.76
O2 AVERAGE BIAS:	20.93	21.145	20.82
NOx INITIAL ZERO:	4.2	-0.5	0.4
NOx FINAL ZERO:	-0.5	12.2	8.4
NOx AVERAGE ZERO:	1.85	5.85	4.4
O2 INITIAL ZERO:	0.05	0.08	0.11
O2 FINAL ZERO:	0.08	0.11	0.08
O2 AVERAGE ZERO:	0.065	0.095	0.095
NOx CAL. GAS VALUE:	469	469	469
O2 CAL. GAS VALUE:	20.9	20.9	20.9
NOx CORRECTED AVERAGE:	923.0	883.2	820.6
O2 CORRECTED AVERAGE:	10.67	11.29	11.16
FUEL FACTOR:	9780	9780	9780
NOx LB/MMBTU:	2.20	2.24	2.06
SCFMD:	52438	52479	54688
NOx LB/HR:	346.76	332.06	321.50
AVERAGE:		333.44	

Air Consulting and Engineering
Emission Measurments

Plant:	Tarmac				
Source:	Kiln 2 - SO2 Acid Mist				
Date:	05/31/95				
Run:		1	2	3	Average
Time:	From:	1055	1259	1459	
	To:	1206	1408	1610	

	1	2	3	Average
Water Vapor Sampled (SCF).......	11.852	14.229	12.577	12.886
Stand. Dry Gas Sampled (SCF)....	41.309	43.525	45.639	43.491
Percent Moisture..........................	22.30	24.64	21.60	22.85
Percent Dry Air..........................	77.70	75.36	78.40	77.15
Molecular Weight Dry....................	30.51	30.52	30.53	30.52
Molecular Weight Actual............	27.72	27.44	27.82	27.66
Percent Excess Air....................	113.31	124.19	127.11	121.54
Velocity Of Flue Gas (FPS)...........	32.91	33.02	33.47	33.14
Actual Vol. Flow Rate (ACFM)......	105550.3	105917.7	107366.2	106278.1
Dry Vol. Flow Rate (ACFMD)........	82017.9	79821.9	84170.7	82003.5
Stand. Vol Flow Rate (SCFMD)....	52185.2	51012.5	53962.5	52386.7
Percent Isokinetics.....................	93.0	100.2	99.3	97.5
ACID MIST				
Emission Conc. (gr/DSCF)............	0.01326	0.00143	0.00055	0.00508
Emission Conc. (gr/ACF)............	0.00656	0.00069	0.00049	0.00258
Emission Conc. (lbs/DSCF)...........	1.89E-06	2.04E-07	7.79E-08	7.25E-07
Emission Rate (lbs/Hr)................	5.93	0.63	0.25	2.27
SULFUR DIOXIDE				
Emission Conc. (gr/DSCF)............	0.00945	0.01661	0.00392	0.00999
Emission Conc. (gr/ACF)............	0.00467	0.00800	0.00354	0.00540
Emission Conc. (lbs/DSCF)...........	1.35E-06	2.37E-06	5.60E-07	1.43E-06
Emission Rate (lbs/Hr)................	4.23	7.26	1.81	4.43

Air Consulting and Engineering
Emission Measurments

Plant:	Tarmac			
Source:	Kiln 2 - SO2 Acid Mist			
Date:	05/31/95			
Run:	1			
Time	From:	1055	To:	1206

Sample Time.(Min).....	60	Final Volume (ftE3)...	659.835
Pitot Cofficient..........	0.84	Initial Volume (ftE3)...	616.400
Bar. Pres.(in Hg).......	30.04	Net Volume (ftE3)......	43.435
Static Pres.(in H2O)....	0.00	Condensate (ml).........	251.8
Meter Correction (Y).	0.997	% Carbon Dioxide......	13.0
Nozzle Diameter (in.)	0.373	% Oxygen.................	10.7
Stack Area (ftE2)......	53.456	F Factor....................	NA

Port-Point	Delta-P	Delta-H	Stack T	Meter T
1-1	0.26	2.10	372	92
-2	0.24	1.90	373	92
-3	0.22	1.80	373	92
-4	0.21	1.70	373	93
-5	0.20	1.60	372	94
-6	0.18	1.50	371	95
2-1	0.27	2.20	368	96
-2	0.24	1.90	373	96
-3	0.24	1.90	373	96
-4	0.21	1.70	372	97
-5	0.20	1.60	372	97
-6	0.20	1.60	372	97
3-1	0.18	1.50	373	99
-2	0.23	1.90	370	99
-3	0.22	1.80	374	100
-4	0.20	1.60	373	100
-5	0.19	1.50	373	100
-6	0.18	1.50	372	101
4-1	0.23	1.90	373	101
-2	0.24	1.90	379	101
-3	0.20	1.60	379	102
-4	0.17	1.40	377	102
-5	0.18	1.50	375	103
-6	0.17	1.40	374	103
Averages:	0.21	1.71	373.17	97.83

	Acid Mist	SO2
Titrant Volume (ml)	2.40	2.40
Blank Volume (ml)	0.00	0.00
Titrant Normality	0.010989	0.010989
Solution Volume (ml)	550.00	300.00
Aliquot Volume (ml)	20.00	10.00
Pollutant Mass (mg)	35.57	25.34

Air Consulting and Engineering
Emission Measurments

Plant:	Tarmac			
Source:	Kiln 2 - SO2 Acid Mist			
Date:	05/31/95			
Run:	2			
Time	From:	1259	To:	1408

Sample Time.(Min).....	60	Final Volume (ftE3)...	706.084
Pitot Cofficient..........	0.84	Initial Volume (ftE3)...	660.000
Bar. Pres.(in Hg).......	30.04	Net Volume (ftE3)......	46.084
Static Pres.(in H2O)....	0.00	Condensate (ml).........	302.3
Meter Correction (Y).	0.997	% Carbon Dioxide......	13.0
Nozzle Diameter (in.)	0.373	% Oxygen.................	11.1
Stack Area (ftE2)......	53.456	F Factor....................	NA

Port-Point	Delta-P	Delta-H	Stack T	Meter T
1-1	0.24	1.90	372	99
-2	0.23	1.90	372	99
-3	0.22	1.80	373	99
-4	0.21	1.70	372	100
-5	0.20	1.60	371	100
-6	0.20	1.60	371	100
2-1	0.23	2.10	372	100
-2	0.19	1.70	371	100
-3	0.19	1.70	372	101
-4	0.20	1.80	372	101
-5	0.20	1.80	372	101
-6	0.19	1.70	372	101
3-1	0.28	2.50	371	102
-2	0.27	2.40	371	102
-3	0.24	2.20	372	102
-4	0.23	2.10	372	103
-5	0.19	1.70	369	104
-6	0.16	1.40	357	104
4-1	0.21	1.90	364	104
-2	0.23	2.10	367	104
-3	0.22	2.00	367	104
-4	0.22	2.00	366	105
-5	0.16	1.40	365	105
-6	0.16	1.40	365	106
Averages:	0.21	1.85	369.50	101.92

	Acid Mist	SO2
Titrant Volume (ml)	0.25	4.85
Blank Volume (ml)	0.00	0.00
Titrant Normality	0.010989	0.010989
Solution Volume (ml)	300.00	550.00
Aliquot Volume (ml)	10.00	20.00
Pollutant Mass (mg)	4.04	46.95

Air Consulting and Engineering
Emission Measurments

Plant:	Tarmac			
Source:	Kiln 2 - SO2 Acid Mist			
Date:	05/31/95			
Run:	3			
Time	From:	1459	To:	1610

Sample Time.(Min).....	60	Final Volume (ftE3)...	754.158
Pitot Cofficient..........	0.84	Initial Volume (ftE3)...	706.200
Bar. Pres.(in Hg).......	30.04	Net Volume (ftE3)......	47.958
Static Pres.(in H2O)....	0.00	Condensate (ml).........	267.2
Meter Correction (Y).	0.997	% Carbon Dioxide......	13.0
Nozzle Diameter (in.)	0.373	% Oxygen.................	11.2
Stack Area (ftE2)......	53.456	F Factor....................	NA

Port-Point	Delta-P	Delta-H	Stack T	Meter T
1-1	0.26	2.40	366	96
-2	0.25	2.30	366	96
-3	0.23	2.10	367	96
-4	0.22	2.00	366	96
-5	0.20	1.80	366	96
-6	0.17	1.50	366	96
2-1	0.29	2.60	365	98
-2	0.28	2.50	367	97
-3	0.26	2.40	367	96
-4	0.23	2.10	366	97
-5	0.23	2.10	367	98
-6	0.22	2.00	367	98
3-1	0.18	1.60	367	98
-2	0.23	2.10	367	98
-3	0.23	2.10	369	99
-4	0.19	1.70	368	99
-5	0.21	1.90	369	99
-6	0.20	1.80	370	99
4-1	0.24	2.20	365	99
-2	0.23	2.10	367	99
-3	0.21	1.90	367	99
-4	0.19	1.70	366	100
-5	0.18	1.60	367	100
-6	0.17	1.50	367	100
Averages:	0.22	2.00	366.88	97.88

	Acid Mist	SO2
Titrant Volume (ml)	0.10	1.20
Blank Volume (ml)	0.00	0.00
Titrant Normality	0.010989	0.010989
Solution Volume (ml)	300.00	550.00
Aliquot Volume (ml)	10.00	20.00
Pollutant Mass (mg)	1.62	11.62

APPENDIX B

FIELD DATA SHEETS

ACE AIR CONSULTING & ENGINEERING, INC.
2106 NW 67TH PLACE SUITE 4
GAINESVILLE, FLORIDA 32653
(904) 335-1889 - OFFICE / (904) 335-1891 - FAX

PLANT TARMAC FLORIDA, INC.
SOURCE CEMENT KILN 2
PLANT LOCATION MEDLEY, FLORIDA
TYPE OF SAMPLING TRAIN EPA-8
TYPE OF SAMPLES ~~PM~~/SO2/ACID MIST
DATE 5/31/95 RUN NUMBER 1
TIME START 1055 TIME END 1206
SAMPLE TIME 24 / 2.5 (MIN/PT)= 60 TOTAL MIN
ASSUMED MOISTURE(%) 26 FDA .74
NOMOGRAPH Cf 1.08.1 PITOT Cf .84
Pb ("Hg) 30.04 Ps ("Hg) 30.04
WEATHER CLEAR TEMP (F) 90's
METER BOX NO. 6 H 1.809 Y .997
NOZZLE IDENTIFIICATION NO. SF. #1
NOZZLE CAL .373 / .373 / .372 = .373
STACK DIMENSIONS 99"
STACK AREA (FT2) 53.456 EFFECTIVE (FT2) 53.456
STACK DIAMETERS:(UPSTREAM) 81' (DOWNSTREAM) 100'
PORT SIZE ______ NIPPLE LENGTH NA
STACK HEIGHT (FT) ______ UMBILICAL LENGTH 200'
AGENCY OBSERVER(S) MARC A. LÉVEILLÉ/FRANK DELGADO (METRO DADE)
TEST COORDINATOR(S) SCOTT QUAAS (TARMAC)
V. E. OBSERVER ______

STACK CONFIGURATION

9 ok!

2479502B

REMARKS:

TEST ID ______
PAGE 1 OF 2
MATERIAL PROCESSING RATE ______
GAS METER READINGS: FINAL 659.835 (FT3)
INITIAL 616.400 (FT3)
NET 43.435 (FT3)
FILTER NO. 6293 IMP. VOL.GAIN 242 (ml)
SILICA GEL NO. 10 WT. GAIN 9.8 (ml)
TOTAL CONDENSATE ______ (ml)

ORSAT

	1	2	3	4	AVG.
%CO2					13.0
%O2					10.7
%CO					
%N2					

Fo= ______ Fo RANGE= ______ ORSAT ANALYZER SN

LEAK CHECKS
PRE 0.00 CFM 10.0 ("Hg) POST 0.00 CFM 9 ("Hg)
METER BOX/PUMP ✓ GAS SYSTEM ✓ ORSAT BAG ✓
PITOT TUBE NO. 7S PRE-TEST LEAK CHECK OK
POST TEST (+) 3.9 / 0.00 "H20 (15 SECONDS)
POST TEST (-) 4.3 / 0.00 "H20 (15 SECONDS)
PYROMETER NUMBER ATK-3
BOX OPERATOR GH PROBE HOLDER JG

PORT & TRAVERSE PT. NUMBER	COMMENTS	CLOCK TIME	GAS METER READING (FT3)	STACK VELOCITY HEAD	METER ORIFICE PRESS. DIFF.("H2O) CALC.	ACTUAL	STACK GAS TEMP (F)	SAMPLE BOX TEMP (F)	LAST IMPINGER TEMP (F)	DRY GAS METER TEMP (F)	VACUUM ON SAMPLE TRAIN ("Hg)
1-1			618.21	.26	2.1	2.1	372	226	57	92	5
2		1100	620.14	.24	1.9	1.9	373	230	58	92	5
3			621.95	.22	1.8	1.8	373	228	41	92	5
4		1105	623.77	.21	1.7	1.7	373	229	43	93	5
5			625.55	.20	1.6	1.6	372	226	44	94	5
6		1110	627.20	.18	1.5	1.5	371	230	44	95	4

ACE AIR CONSULTING & ENGINEERING, INC.

TEST ID 1

PORT & TRAVERSE PT. NUMBER	COMMENTS	CLOCK TIME	GAS METER READING (FT3)	STACK VELOCITY HEAD	METER ORIFICE PRESS. DIFF.("H2O) CALC.	ACTUAL	STACK GAS TEMP (F)	SAMPLE BOX TEMP (F)	LAST IMPINGER TEMP (F)	DRY GAS METER TEMP (F)	VACUUM ON SAMPLE TRAIN ("Hg)
		(10.8 /	11.2)	(.466)							
2-1			629.15	.27	2.2	2.2	368	245	45	96	5
2		1118	630.90	.24	1.9	1.9	373	242	44	96	5
3			634.45	.24	1.9	1.9	373	237	46	96	5
4		1123	635.79	.21	1.7	1.7	372	237	47	97	5
5			636.65	.20	1.6	1.6	372	237	47	97	4
6		1128	638.40	.20	1.6	1.6	372	239	48	97	4
		(22.6 /	22.0)	(.475)						(97)	
3-1			640.40	.18	1.5	1.5	373	251	45	99	4
2		1137	642.41	.23	1.9	1.9	370	247	45	99	4
3			643.82	.22	1.8	1.8	374	241	45	100	4
4		1142	645.71	.20	1.6	1.6	373	240	45	100	4
5			647.51	.19	1.5	1.5	373	235	46	100	4
6		1147	649.22	.18	1.5	1.5	372	235	47	101	4
		(33.3 /	32.8)	(.447)						(100)	
4-1			651.13	.23	1.9	1.9	373	240	49	101	5
2		1156	652.90	.24	1.9	1.9	379	254	49	101	5
3			654.90	.20	1.6	1.6	379	250	50	102	5
4		1201	656.75	.17	1.4	1.4	377	260	50	102	5
5			658.41	.18	1.5	1.5	375	270	50	103	5
6		1206	659.835	.17	1.4	1.4	374	~~3~~270	51	103	5
		(42.99 /	)	(.404)							

[redacted]

PLANT [redacted]

SOURCE CEMENT KILN 2

PLANT LOCATION MEDLEY, FL.

TYPE OF SAMPLING TRAIN EPA-8

TYPE OF SAMPLES ACID MIST/SO_2/

DATE 5/31/95 RUN NUMBER 2

TIME START 1259 TIME END 1408

SAMPLE TIME 24 / 2.5 (MIN/PT)= 60 TOTAL MIN

ASSUMED MOISTURE(%) 26 FDA .74

NOMOGRAPH Cf 1 = 8.19.0 PITOT Cf .84

Pb ("Hg) 30.04 Ps ("Hg) 30.04

WEATHER CLEAR TEMP (F) 90's

METER BOX NO. 6 H 1.809 Y .997

NOZZLE IDENTIFIICATION NO. S.F. #1

NOZZLE CAL ______ / ______ / ______ = .373

STACK DIMENSIONS 99"

STACK AREA (FT2) 53.456 EFFECTIVE (FT2) 53.456

STACK DIAMETERS:(UPSTREAM) 81' (DOWNSTREAM) 100'

PORT SIZE ______ NIPPLE LENGTH NA

STACK HEIGHT (FT) ______ UMBILICAL LENGTH 200'

AGENCY OBSERVER(S) ______

TEST COORDINATOR(S) ______

V. E. OBSERVER ______

ACE AIR CONSULTING & ENGINEERING, INC.
2106 NW 67TH PLACE SUITE 4
GAINESVILLE, FLORIDA 32653
(904) 335-1889 - OFFICE / (904) 335-1891 - FAX

STACK CONFIGURATION

TARK2-2

REMARKS: ______

TEST ID ______

PAGE 1 OF 2

MATERIAL PROCESSING RATE ______

GAS METER READINGS: FINAL 706.084 (FT3)

INITIAL 660.000 (FT3)

NET 46.084 (FT3)

FILTER NO. ~~6293~~ 6295 IMP. VOL.GAIN 258 (ml)

SILICA GEL NO. to192 WT. GAIN 44.3 (ml)

TOTAL CONDENSATE ______ (ml)

ORSAT

	1	2	3	4	AVG.
%CO2					13.0
%O2					11.1
%CO					
%N2					

Fo= ______ Fo RANGE= ______ ORSAT ANALYZER SN

LEAK CHECKS

PRE 0.00 CFM 6.0 ("Hg) POST 0.00 CFM 9.5 ("Hg)

METER BOX/PUMP ✓ GAS SYSTEM ✓ ORSAT BAG ✓

PITOT TUBE NO. 73 PRE-TEST LEAK CHECK OK

POST TEST (+) 5.1 / 0.00 "H2O (15 SECONDS)

POST TEST (-) 6.7 / 0.00 "H2O (15 SECONDS)

PYROMETER NUMBER ATK-3

BOX OPERATOR CH PROBE HOLDER JG.

PORT & TRAVERSE PT. NUMBER	COMMENTS	CLOCK TIME	GAS METER READING (FT3)	STACK VELOCITY HEAD	METER ORIFICE PRESS. DIFF.("H2O) CALC.	METER ORIFICE PRESS. DIFF.("H2O) ACTUAL	STACK GAS TEMP (F)	SAMPLE BOX TEMP (F)	LAST IMPINGER TEMP (F)	DRY GAS METER TEMP (F)	VACUUM ON SAMPLE TRAIN ("Hg)
1-1		1304	662.12	.24	1.9	1.9	372	233	51	99	4
2		1309	664.25	.23	1.9	1.9	372	233	47	99	4
3		1314	665.64	.22	1.8	1.8	373	230	51	99	4
4		1319	667.51	.21	1.7	1.7	372	231	51	100	4
5		1324	669.03	.20	1.6	1.6	371	233	55	100	4
6		1329	671.23	.20	1.6	1.6	371	233	56	100	4

ACE AIR CONSULTING & ENGINEERING, INC.

TEST ID 2

PORT & TRAVERSE PT. NUMBER	COMMENTS	CLOCK TIME	GAS METER READING (FT3)	STACK VELOCITY HEAD	METER ORIFICE PRESS. DIFF.("H2O) CALC.	METER ORIFICE PRESS. DIFF.("H2O) ACTUAL	STACK GAS TEMP (F)	SAMPLE BOX TEMP (F)	LAST IMPINGER TEMP (F)	DRY GAS METER TEMP (F)	VACUUM ON SAMPLE TRAIN ("Hg)
		(11.72	/ 11.23)	(.465)							
2.1			673.03	.23	2.1	2.1	372	241	46	100	5
2		1322	674.19	.19	1.7	1.7	371	249	47	100	4
3			675.33	.19	1.7	1.7	372	251	49	101	4
4		1327	678.01	.20	1.8	1.8	372	251	50	101	5
5			680.71	.20	1.8	1.8	372	246	50	101	4
6		1332	682.56	.19	1.7	1.7	372	249	51	101	4
		(23.0	/ 22.6)	(.447)							
3.1			684.95	.28	2.5	2.5	371	250	51	102	5
2		1341	686.90	.27	2.4	2.4	371	251	52	102	6
3			689.22	.24	2.2	2.2	372	260	53	102	4
4		1346	691.55	.23	2.1	2.1	372	261	53	103	5
5			693.—	.19	1.7	1.7	369	255	53	104	4
6		1351	695.08	.16	1.4	1.4	357	256	53	104	4
		(34.9	/ 35.1)	(.476)							
4.1			696.76	.21	1.9	1.9	364	254	47	104	4
2		1358	699.00	.23	2.1	2.1	367	250	48	104	5
3			701.00	.22	2.0	2.0	367	248	49	104	5
4		1403	702.65	.22	2.0	2.0	366	243	50	105	5
5			704.71	.16	1.4	1.4	365	245	50	105	4
6		1408	706.084	.16	1.4	1.4	365	246	50	106	4
		(34.0	/)	(.446)							

PLANT [redacted]

SOURCE CEMENT KILN 2

PLANT LOCATION MEDLEY, FL.

TYPE OF SAMPLING TRAIN EPA-8

TYPE OF SAMPLES ACID MIST / SO_2

DATE 5/31/95 RUN NUMBER 3

TIME START 1459 TIME END 1610

SAMPLE TIME 24 / 2.5 (MIN/PT)= 60 TOTAL MIN

ASSUMED MOISTURE(%) 26 FDA .74

NOMOGRAPH Cf 1=9.0 PITOT Cf .84

Pb ("Hg) 30.04 Ps ("Hg) 30.04

WEATHER CLEAR TEMP (F) 90's

METER BOX NO. 6 H 1.809 Y .997

NOZZLE IDENTIFIICATION NO. S.F.-#1

NOZZLE CAL ___ / ___ / ___ = .373

STACK DIMENSIONS 99'

STACK AREA (FT2) 53.456 EFFECTIVE (FT2) 53.456

STACK DIAMETERS:(UPSTREAM) 81' (DOWNSTREAM) 100'

PORT SIZE ___ NIPPLE LENGTH ~4

STACK HEIGHT (FT) ___ UMBILICAL LENGTH 200'

AGENCY OBSERVER(S)

TEST COORDINATOR(S)

V. E. OBSERVER

ACE AIR CONSULTING & ENGINEERING, INC.

2106 NW 67TH PLACE SUITE 4
GAINESVILLE, FLORIDA 32653
(904) 335-1889 - OFFICE / (904) 335-1891 - FAX

STACK CONFIGURATION

REMARKS:

TEST ID [redacted] 3

PAGE 1 OF 2

MATERIAL PROCESSING RATE

GAS METER READINGS: FINAL 754.158 (FT3)

INITIAL 706.200 (FT3) 47.958

6291 NET 44.958 (FT3)

FILTER NO. ~~6291~~ 5-CH IMP. VOL.GAIN ~~258~~ 245 (ml)

SILICA GEL NO. ~~245~~ 79 -CH WT. GAIN -CH ~~24~~ 32.2 (ml)

TOTAL CONDENSATE ___ (ml)

ORSAT

	1	2	3	4	AVG.
%CO2					13.0
%O2					11.2
%CO					
%N2					

Fo= ___ Fo RANGE= ___ ORSAT ANALYZER SN

LEAK CHECKS

PRE 0.00 CFM 8.5 ("Hg) POST 0.00 CFM 10.0 ("Hg)

METER BOX/PUMP ✓ GAS SYSTEM ✓ ORSAT BAG ✓

PITOT TUBE NO. 73 PRE-TEST LEAK CHECK ✓

POST TEST (+) 4.2 / 0.0 "H20 (15 SECONDS)

POST TEST (-) 5.2 / 0.0 "H20 (15 SECONDS)

PYROMETER NUMBER AHL-3

BOX OPERATOR CH PROBE HOLDER JG

PORT & TRAVERSE PT. NUMBER	COMMENTS	CLOCK TIME	GAS METER READING (FT3)	STACK VELOCITY HEAD	METER ORIFICE PRESS. DIFF.("H2O) CALC.	ACTUAL	STACK GAS TEMP (F)	SAMPLE BOX TEMP (F)	LAST IMPINGER TEMP (F)	DRY GAS METER TEMP (F)	VACUUM ON SAMPLE TRAIN ("Hg)
1-1			708.61	.26	2.4	2.4	366	230	59	96	4
2		1504	710.08	.25	2.3	2.3	366	240	58	96	4
3			712.40	.23	2.1	2.1	367	230	58	96	4
4		1509	714.40	.22	2.0	2.0	366	230	58	96	4
5			716.41	.20	1.8	1.8	366	228	59	96	4
6		1514	718.27	.17	1.5	1.5	366	231	59	96	4

ACE AIR CONSULTING & ENGINEERING, INC.

TEST ID 3

PORT & TRAVERSE PT. NUMBER	COMMENTS	CLOCK TIME	GAS METER READING (FT3)	STACK VELOCITY HEAD	METER ORIFICE PRESS. DIFF.("H2O)		STACK GAS TEMP (F)	SAMPLE BOX TEMP (F)	LAST IMPINGER TEMP (F)	DRY GAS METER TEMP (F)	VACUUM ON SAMPLE TRAIN ("Hg)
					CALC.	ACTUAL					
		(11.8 /	)	(.470)							
2-1			720.25	.29	2.6	2.6	365	229	51	98	5
2		1520	723.09	.28	2.5	2.5	367	250	51	97	5
3			725.00	.26	2.4	2.4	367	261	56	96	5
4		1525	727.05	.23	2.1	2.1	366	258	57	97	5
5			729.18	.23	2.1	2.1	367	257	57	98	4
6		1530	731.00	.22	2.0	2.0	367	254	57	98	4
		(24.4 /	24.8)	(.50)							
3-1			733.05	.18	1.6	1.6	367	257	56	98	4
2		1536	735.00	.23	2.1	2.1	367	259	57	98	4
3			~~738.81~~	.23	2.1	2.1	369	262	58	99	4
4		1541	738.81	.19	1.7	1.7	368	264	59	99	4
5			740.84	.21	1.9	1.9	369	265	59	99	4
6		1546	742.63	.20	1.8	1.8	370	264	59	99	4
		(35.8 /	36.4)	(.464)							
4-1			743.88	.24	2.2	2.2	365	260	57	99	4
2		1600	746.61	.23	2.1	2.1	367	261	59	99	4
3			748.70	.21	1.9	1.9	367	261	57	99	4
4		1605	750.51	.19	1.7	1.7	366	260	58	100	4
5			752.25	.18	1.6	1.6	367	262	59	100	4
6		1610	754.158	.17	1.5	1.5	367	261	59	100	4
		(47.1 /	)	(~~.451~~) .45							

APPENDIX C

LABORATORY ANALYSIS

BEST AVAILABLE COPY

PRE PURGE

ACE AIR CONSULTING & ENGINEERING, INC.

AIR CONSULTING AND ENGINEERING, INC.
SO_2 LAB DATA

Plant Name TARMAC Unit KILN 2-ACID MIST

Analyzed By MS Date Analyzed 6.9.95

Samp.No.	V.T.	V.T.B.	N.	V.Soln.	V.A.
1	2.4	0.0	0.010989	550	20
1	2.4				
2	~~4.8~~.2				
2	~~4.9~~.3				
3	~~1.2~~.1				
3	~~1.2~~.1				
Blank	0.0				
↓	0.0	↓	↓	↓	↓

- 121 ~~81~~ mL
- 120 ~~80~~ mL
- 120 ~~81~~ mL

V.T. = Titrant Volume (ml)
V.T.B. = Titrant Volume For Blank (ml)
N. = Titrant Normality
V.Soln.= Sample Volume (ml)
V.A. = Aliquot Volume (ml)

$$C_{SO2} = K \frac{(Vt - Vtb)(N)\left(\frac{Vsol}{Va}\right)}{Vstd}$$

Where: C_{SO2} = Concentration SO2 in lbs/SCF

$K = 7.061 \times 10^{-5}$ lbs/MEQ

ACE AIR CONSULTING & ENGINEERING, INC.

AIR CONSULTING AND ENGINEERING, INC.
SO_2 LAB DATA

Plant Name TARMAC　　　　Unit KILN 2 - Probe Wash / Filt

Analyzed By MS　　　　Date Analyzed 6.9.95

Samp.No.	V.T.	V.T.B.	N.	V.Soln.	V.A.
1	0.0		0.010989	200mL	20
1	0.0				
2	0.0				
2	0.0				
3	0.0				
3	0.0				

-40mL

-40mL

V.T. = Titrant Volume (ml)
V.T.B. = Titrant Volume For Blank (ml)
N. = Titrant Normality
V.Soln.= Sample Volume (ml)
V.A. = Aliquot Volume (ml)

$$C_{SO2} = K \frac{(Vt - Vtb)\,(N)\left(\frac{Vsol}{Va}\right)}{Vstd}$$

Where: C_{SO2} = Concentration SO2 in lbs/SCF
$K = 7.061 \times 10^{-5}$ lbs/MEQ

BEST AVAILABLE COPY

ACE AIR CONSULTING & ENGINEERING, INC.

AIR CONSULTING AND ENGINEERING, INC.
SO_2 LAB DATA

Plant Name TARMAC Unit KILN 2 - SO_2

Analyzed By MS Date Analyzed 6·9·95

Samp.No.	V.T.	V.T.B.	N.	V.Soln.	V.A.
1	2.4	~~.3~~ 0.0	0.00989	300	10
1	2.4				
2	~~.2~~ 4.8				
2	~~.3~~ 4.9				
3	~~.1~~ 1.2				
3	~~.1~~ 1.2				
Blank	~~.2~~ 0.0				
↓	~~.3~~ 0.0				

81 -~~41~~ mL

80 -~~40~~ mL

80 -~~40~~ mL

V.T. = Titrant Volume (ml)
V.T.B. = Titrant Volume For Blank (ml)
N. = Titrant Normality
V.Soln.= Sample Volume (ml)
V.A. = Aliquot Volume (ml)

$$C_{SO2} = K \frac{(Vt - Vtb)\ (N) \left(\frac{Vsol}{Va}\right)}{Vstd}$$

Where: C_{SO2} = Concentration SO2 in lbs/SCF

$K = 7.061 \times 10^{-5}$ lbs/MEQ

APPENDIX D

STRIP CHART COPIES

```
******** ON ********
******** RUN ********
07:11:41 05/31/95

******** STOP ********
07:12:12 ?5/31/95
Run statistic? ?=00006
Min Avg Max
1 -014.43-010.64-009.18
2 006.29 006.41 006.70

07:12:13 05/31/95
RUN starts logging
STOP stops logging
PROG starts programming

******** OFF ********

******** ON ********
******** RUN ********
07:16:22 05/31/95

******** STOP ********
07:16:35 05/31/95
Run statistics N=00002
Min Avg Max
1 -007.63-007.51-007.40
2 099.93 099.94 099.94

07:16:37 05/31/95
RUN starts logging
STOP stops logging
PROG starts programming

******** RUN ********
07:17:25 05/31/95

******** STOP ********
07:17:37 05/31/95
Run statistics N=00002
Min Avg Max
1 -005.30-003.69-002.08
2 099.93 099.94 099.94

07:17:38 05/31/95
RUN starts logging
STOP stops logging
PROG starts programming
******** PROG ********
Program volts mX+b
m polarity = +
m = +1.00000
b polarity = +
b Val? (000000-999999)
b = +000000
Units?(00-64,99 to list)
Units = V
Decimal Position? (0-5)
Decimal position = 1
2 V V 1.00000 000000
******** EXIT ********
******** RUN ********
07:18:06 05/31/95

**** NEW BATTE


**** NEW BATTERY ****
***** clock init *****
***** cache init *****
******** ON ********
00:00:02 01/01/80
RUN starts logging
STOP stops logging
PROG starts programming

**** NEW BATTERY ****
***** clock init *****
***** cache init *****
******** ON ********
00:00:02 01/01/80
RUN starts logging
STOP stops logging
PROG starts programming

******** OFF ********

******** ON ********
******** RUN ********
00:01:46 01/01/80

******** STOP ********
00:01:54 01/01/80
Run statistics N=00001
Min Avg Max
1 -009.60-009.60-009.60
2 0004.2 0004.2 0004.2

00:01:56 01/01/80
RUN starts logging
STOP stops logging
PROG starts programming

******** RUN ********
00:02:27 01/01/80

******** STOP ********
00:02:45 01/01/80
Run statistics N=00003
Min Avg Max
1 -007.18-005.67-004.45
2 0999.3 0999.3 0999.3

00:02:47 01/01/80
RUN starts logging
STOP stops logging
PROG starts programming

******** OFF ********

******** ON ********
******** RUN ********
00:03:43 01/01/80

******** STOP ********
00:03:59 01/01/80
Run statistics N=00003
Min Avg Max
1 -007.90-005.93-004.85
2 0004.2 0335.8 0999.1

00:04:01 01/01/80
RUN starts logging
STOP stops logging
PROG starts programming

******** RUN ********
00:04:14 01/01/80

******** STOP ********
00:04:23 01/01/80
Run statistics N=00002
Min Avg Max
1 -008.23-007.15-006.08
2 0004.1 0004.1 0004.2

00:04:24 01/01/80
RUN starts logging
STOP stops logging
PROG starts programming

******** RUN ********
00:05:13 01/01/80

******** STOP ********
00:05:25 01/01/80
Run statistics N=00002
Min Avg Max
1 018.50 018.50 018.50
2 0005.0 0005.0 0005.0

00:05:27 01/01/80
RUN starts logging
STOP stops logging
PROG starts programming

******** OFF ********

******** ON ********
00:09:43 01/01/80
RUN starts logging
STOP stops logging
PROG starts programming
******** PROG ********
```

```
 Program volts  mX+b
********  EXIT  ********
********  RUN   ********
   00:09:46  01/01/80

********  STOP  ********
   00:10:07  01/01/80
Run statistics    N=00003
    Min    Avg    Max
1  018.48 018.48 018.50
2  0005.9 0006.0 0006.0
3 -2.0627-2.0626-2.0626

   00:10:09  01/01/80
RUN  starts logging
STOP stops logging
PROG starts programming

********  PROG  ********
 Program volts  mX+b
 m polarity = +
 m = +1.00000
 b polarity = +
 b = +000000
Units?(00-64,99 to list)
 Units = V
Decimal Position? (0-5)
 Decimal position = 4
 3 V V   1.00000 000000
   00:10:37  01/01/80
 Interval=00:00:05  60Hz
 Full in 0000:03:14:25
 Tadjust=+00.0F
 1 V V  -2.50000 000000
 2 V V   1.00000 000000
 3 V V   1.00000 000000
EXIT leaves program mode
OK   skips to next field

Select channel? (1-6)
********  EXIT  ********
   00:10:39  01/01/80
RUN  starts logging
STOP stops logging
PROG starts programming
********  RUN   ********
   00:10:44  01/01/80

********  STOP  ********
   00:11:04  01/01/80
Run statistics    N=00002
    Min    Avg    Max
1  018.48 018.48 018.48
2  0006.0 0006.0 0006.0
3 -0.0021-0.0019-0.0017

   00:11:05  01/01/80
RUN  starts logging
```

```
STOP stops logging
PROG starts programming
********  PROG  ********
 Program volts  mX+b
m Positive? (Yes/No)
 m polarity = -
m Val? (0.00000-9.99999)
 m = -5.00000
b Positive? (Yes/No)
 b polarity = +
b Val? (000000-999999)
 b = +000000
Units?(00-64,99 to list)
 Units = V
Decimal Position? (0-5)
 Decimal position = 2
 3 V V  -5.00000 000000
********  EXIT  ********
********  RUN   ********
   00:11:48  01/01/80

********  STOP  ********
   00:12:14  01/01/80
Run statistics    N=00005
    Min    Avg    Max
1  004.55 020.02 041.23
2  0005.9 0005.9 0005.9
3  ****** ****** ******

   00:12:15  01/01/80
RUN  starts logging
STOP stops logging
PROG starts programming

********  PROG  ********
 Program volts  mX+b
 m polarity = -
 m = -5.00000
 b polarity = +
 b = +000000
 Units = V
Decimal Position? (0-5)
 Decimal position = 0
 3 V V  -5.00000 000000
********  EXIT  ********
********  RUN   ********
   00:12:42  01/01/80

********  STOP  ********
   00:12:55  01/01/80
Run statistics    N=00002
    Min    Avg    Max
1  018.13 018.31 018.50
2  0005.9 0005.9 0005.9
3  ****** ****** ******

   00:12:56  01/01/80
RUN  starts logging
```

```
STOP stops logging
PROG starts programming

********  OFF   ********

********  ON    ********
********  RUN   ********
   00:13:59  01/01/80

********  STOP  ********
   00:14:15  01/01/80
Run statistics    N=00003
    Min    Avg    Max
1  018.48 018.48 018.50
2  0005.8 0005.9 0005.9
3  ****** ****** ******

   00:14:16  01/01/80
RUN  starts logging
STOP stops logging
PROG starts programming

********  PROG  ********
CH3 Type(J,K,T,E,V,SKIP)
 Program volts  mX+b
m Positive? (Yes/No)
 m polarity = -
m Val? (0.00000-9.99999)
 m = -0.50000
********  EXIT  ********
********  RUN   ********
   00:15:15  01/01/80

********  STOP  ********
   00:15:27  01/01/80
Run statistics    N=00002
    Min    Avg    Max
1  018.48 018.49 018.50
2  0005.9 0005.9 0005.9
3  10314. 10314. 10314.

   00:15:28  01/01/80
RUN  starts logging
STOP stops logging
PROG starts programming

********  PROG  ********
 Program volts  mX+b
 m polarity = -
 m = -0.50000
 b polarity = +
b Val? (000000-999999)
 b = +000000
Units?(00-64,99 to list)
 Units = V
Decimal Position? (0-5)
 Decimal position = 1
 3 V V  -0.50000 000000
********  EXIT  ********
```

```
********  RUN    ********
   00:16:00  01/01/80

********  STOP   ********
   00:16:16  01/01/80
Run statistics    N=00003
    Min     Avg     Max
1  018.50 018.50 018.50
2  0004.9 0005.6 0005.9
3  1031.4 1031.4 1031.4

   00:16:17  01/01/80
RUN  starts logging
STOP stops logging
PROG starts programming

********  OFF    ********

********  ON     ********
********  PROG   ********
CH4 Type(J,K,T,E,V,SKIP)
 Program volts  mX+b
m Positive? (Yes/No)
********  EXIT   ********
********  RUN    ********
   00:21:39  01/01/80

********  STOP   ********
   00:22:11  01/01/80
Run statistics    N=00006
    Min     Avg     Max
1 -010.78-006.09-003.88
2  0004.8 0004.9 0004.9
3 -0000.2-0000.1 0000.0
4  ****** ******-0.2165

   00:22:12  01/01/80
RUN  starts logging
STOP stops logging
PROG starts programming

********  RUN    ********
   00:22:55  01/01/80

********  STOP   ********
   00:23:05  01/01/80
Run statistics    N=00002
    Min     Avg     Max
1  018.53 018.53 018.53
2  0004.9 0004.9 0004.9
3 -0000.1-0000.1 0000.0
4 -0.2271-0.2260-0.2249

   00:23:07  01/01/80
RUN  starts logging
STOP stops logging
PROG starts programming
********  PROG   ********
 Program volts  mX+b
```

```
m Positive? (Yes/No)
 m polarity = -
m Val? (0.00000-9.99999)
 m = -5.00000
b Positive? (Yes/No)
 b polarity = +
 b = +000000
Units?(00-64,99 to list)
 Units = V
Decimal Position? (0-5)
 Decimal position = 2
 4 V V  -5.00000 000000
********  EXIT   ********
********  RUN    ********
   00:23:46  01/01/80

********  STOP   ********
   00:24:08  01/01/80
Run statistics    N=00004
    Min     Avg     Max
1  018.53 018.53 018.55
2  0004.0 0004.0 0004.0
3 -0000.3 0000.0 0000.2
4  106.40 106.64 107.00

   00:24:10  01/01/80
RUN  starts logging
STOP stops logging
PROG starts programming

********  OFF    ********

********  ON     ********
********  RUN    ********
   01:22:19  01/01/80

********  STOP   ********
   01:22:37  01/01/80
Run statistics    N=00003
    Min     Avg     Max
1  001.78 001.78 001.80
2 -0000.3 0000.4 0000.8
3 -0000.2 0000.0 0000.3
4  060.65 060.98 061.30

   01:22:38  01/01/80
RUN  starts logging
STOP stops logging
PROG starts programming
********  STOP   ********
   01:22:48  01/01/80
Run statistics    N=00003
    Min     Avg     Max
1  001.78 001.78 001.80
2 -0000.3 0000.4 0000.8
3 -0000.2 0000.0 0000.3
4  060.65 060.98 061.30

   01:22:49  01/01/80
RUN  starts logging
```

```
STOP stops logging
PROG starts programming

********  OFF    ********

********  ON     ********
********  RUN    ********
   01:26:22  01/01/80
********  STOP   ********
   01:26:26  01/01/80
Run statistics    N=00003
    Min     Avg     Max
1  001.78 001.78 001.80
2 -0000.3 0000.4 0000.8
3 -0000.2 0000.0 0000.3
4  060.65 060.98 061.30

   01:26:28  01/01/80
RUN  starts logging
STOP stops logging
PROG starts programming

********  OFF    ********

********  ON     ********
********  RUN    ********
   01:43:26  01/01/80

********  STOP   ********
   01:43:41  01/01/80
Run statistics    N=00003
    Min     Avg     Max
1 -004.60-001.90-000.03
2  0002.7 0003.1 0003.8
3  0002.7 0002.7 0002.7
4  089.65 089.85 090.15

   01:43:42  01/01/80
RUN  starts logging
STOP stops logging
PROG starts programming

********  PROG   ********
 Program volts  mX+b
 m polarity = -
 m = -5.00000
 b polarity = +
b Val? (000000-999999)
 b = +000000
 Units = V
Decimal Position? (0-5)
 Decimal position = 3
 4 V V  -5.00000 000000
********  EXIT   ********
********  RUN    ********
   01:44:20  01/01/80

********  STOP   ********
   01:44:33  01/01/80
```

```
Run statistics    N=00002
    Min     Avg     Max
1 -003.65 007.79 019.23
2  0002.8 0003.4 0003.9
3  0002.6 0002.6 0002.6
4  08.945 08.952 08.960

   01:44:35  01/01/80
RUN  starts logging
STOP stops logging
PROG starts programming

********  OFF   ********

********  ON    ********
********  RUN   ********
   01:55:26  01/01/80

********  STOP  ********
   01:55:45  01/01/80
Run statistics    N=00003
    Min     Avg     Max
1  000.13 000.16 000.20
2 -0000.2-0000.2-0000.2
3  0359.5 0360.3 0360.8
4  00.730 00.755 00.780

   01:55:47  01/01/80
RUN  starts logging
STOP stops logging
PROG starts programming

********  RUN   ********
   01:56:26  01/01/80

********  STOP  ********
   01:56:38  01/01/80
Run statistics    N=00002
    Min     Avg     Max
1  000.05 000.05 000.05
2 -0001.2-0001.2-0001.2
3  0513.2 0513.3 0513.4
4  00.660 00.662 00.665

   01:56:39  01/01/80
RUN  starts logging
STOP stops logging
PROG starts programming

********  OFF   ********

********  ON    ********
********  RUN   ********
   01:57:36  01/01/80

********  STOP  ********
   01:58:11  01/01/80
Run statistics    N=00007
    Min     Avg     Max
1  000.05 000.05 000.08
2 -0001.3-0000.5-0000.2
3  0472.8 0473.7 0474.6
4 -00.445-00.372-00.320

   01:58:13  01/01/80
RUN  starts logging
STOP stops logging
PROG starts programming

********  RUN   ********
   01:58:49  01/01/80

********  STOP  ********
   01:59:05  01/01/80
Run statistics    N=00003
    Min     Avg     Max
1  000.05 000.05 000.05
2 -0000.2-0000.2-0000.1
3  0473.6 0474.0 0474.2
4 -00.005 00.012 00.030

   01:59:06  01/01/80
RUN  starts logging
STOP stops logging
PROG starts programming

********  OFF   ********

********  ON    ********
********  RUN   ********
   02:01:17  01/01/80

********  STOP  ********
   02:01:49  01/01/80
Run statistics    N=00006
    Min     Avg     Max
1  000.05 000.05 000.05
2  0062.4 0062.5 0062.5
3  0004.4 0004.4 0004.5
4 -00.775-00.737-00.710

   02:01:51  01/01/80
RUN  starts logging
STOP stops logging
PROG starts programming

********  OFF   ********

********  ON    ********
********  RUN   ********
   02:05:13  01/01/80

********  STOP  ********
   02:05:36  01/01/80
Run statistics    N=00004
    Min     Avg     Max
1  019.78 019.81 019.85
2 -0000.2-0000.1-0000.1
3  0004.2 0004.2 0004.3
4  82.470 82.502 82.580

   02:05:38  01/01/80
RUN  starts logging
STOP stops logging
PROG starts programming

********  OFF   ********

********  ON    ********
********  RUN   ********
   02:08:30  01/01/80

********  STOP  ********
   02:08:48  01/01/80
Run statistics    N=00003
    Min     Avg     Max
1  000.10 000.10 000.10
2 -0000.2-0000.2-0000.2
3  0731.7 0732.9 0733.5
4 -00.390-00.355-00.315

   02:08:49  01/01/80
RUN  starts logging
STOP stops logging
PROG starts programming

********  OFF   ********

********  ON    ********
********  RUN   ********
   02:10:52  01/01/80

********  STOP  ********
   02:11:18  01/01/80
Run statistics    N=00005
    Min     Avg     Max
1  020.90 020.94 020.98
2 -0000.2-0000.1-0000.1
3  0004.7 0004.8 0004.9
4  18.905 18.918 18.955

   02:11:19  01/01/80
RUN  starts logging
STOP stops logging
PROG starts programming

********  OFF   ********

********  ON    ********
********  RUN   ********
   02:13:23  01/01/80

********  STOP  ********
   02:13:51  01/01/80
Run statistics    N=00005
    Min     Avg     Max
```

```
1  020.65 020.73 020.83
2 -0000.2-0000.1-0000.1
3  0004.4 0004.4 0004.5
4  01.015 01.021 01.025

   02:13:52  01/01/80
RUN  starts logging
STOP stops logging
PROG starts programming

********  OFF   ********

********  ON    ********
********  RUN   ********
   02:16:45  01/01/80

********  STOP  ********
   02:17:06  01/01/80
Run statistics   N=00004
    Min     Avg     Max
1  020.83 020.83 020.85
2 -0000.2-0000.1-0000.1
3  0004.4 0004.4 0004.4
4  01.170 01.176 01.185

   02:17:07  01/01/80
RUN  starts logging
STOP stops logging
PROG starts programming

********  STOP  ********
   02:17:53  01/01/80
Run statistics   N=00004
    Min     Avg     Max
1  020.83 020.83 020.85
2 -0000.2-0000.1-0000.1
3  0004.4 0004.4 0004.4
4  01.170 01.176 01.185

   02:17:55  01/01/80
RUN  starts logging
STOP stops logging
PROG starts programming
********  RUN   ********
   02:18:09  01/01/80

********  STOP  ********
   02:18:24  01/01/80
Run statistics   N=00003
    Min     Avg     Max
1  021.03 021.03 021.03
2 -0000.2-0000.2-0000.1
3  0004.3 0004.3 0004.4
4  01.170 01.180 01.190

   02:18:26  01/01/80
RUN  starts logging
STOP stops logging
PROG starts programming
```

```
********  OFF   ********

********  ON    ********
********  RUN   ********
   02:21:37  01/01/80

********  STOP  ********
   02:22:05  01/01/80
Run statistics   N=00005
    Min     Avg     Max
1  000.08 000.08 000.10
2  0032.8 0032.9 0032.9
3  0004.3 0004.3 0004.3
4 -00.650-00.599-00.550

   02:22:07  01/01/80
RUN  starts logging
STOP stops logging
PROG starts programming

********  OFF   ********

********  ON    ********
********  RUN   ********
   02:23:29  01/01/80

********  STOP  ********
   02:23:56  01/01/80
Run statistics   N=00005
    Min     Avg     Max
1  005.58 005.57 005.58
2  0001.9 0004.8 0010.7
3  0004.2 0004.2 0004.3
4 -01.190-01.163-01.125

   02:23:57  01/01/80
RUN  starts logging
STOP stops logging
PROG starts programming

********  OFF   ********

********  ON    ********
********  RUN   ********
   02:26:11  01/01/80

********  STOP  ********
   02:26:27  01/01/80
Run statistics   N=00003
    Min     Avg     Max
1  000.05 000.06 000.08
2 -0001.2-0001.2-0001.2
3  0742.3 0742.6 0742.9
4 -01.340-01.327-01.310

   02:26:28  01/01/80
RUN  starts logging
STOP stops logging
```

```
PROG starts programming

********  RUN   ********
   02:27:08  01/01/80

********  STOP  ********
   02:27:34  01/01/80
Run statistics   N=00005
    Min     Avg     Max
1  000.05 000.05 000.05
2 -0001.2-0000.5-0000.1
3  0736.0 0736.6 0738.0
4 -01.400-01.387-01.380

   02:27:36  01/01/80
RUN  starts logging
STOP stops logging
PROG starts programming

********  OFF   ********

********  ON    ********
********  RUN   ********
   02:29:39  01/01/80

********  STOP  ********
   02:29:57  01/01/80
Run statistics   N=00003
    Min     Avg     Max
1  021.05 021.06 021.08
2 -0000.2-0000.1-0000.1
3  0005.4 0005.4 0005.7
4  00.300 00.313 00.330

   02:29:59  01/01/80
RUN  starts logging
STOP stops logging
PROG starts programming

********  OFF   ********

********  ON    ********
********  RUN   ********
   02:30:55  01/01/80

********  STOP  ********
   02:31:16  01/01/80
Run statistics   N=00004
    Min     Avg     Max
1  010.53 010.55 010.58
2  0059.7 0065.7 0071.6
3  ****** ****** 1085.6
4  15.800 15.851 15.955

   02:31:18  01/01/80
RUN  starts logging
STOP stops logging
PROG starts programming
```

```
********  RUN    ********
   02:31:39  01/01/80

********  STOP   ********
   02:31:48  01/01/80
Run statistics    N=00002
    Min     Avg     Max
1  010.45 010.49 010.53
2  0080.8 0080.8 0080.8
3  0430.8 0431.0 0431.2
4  15.245 15.278 15.310

   02:31:50  01/01/80
RUN  starts logging
STOP stops logging
PROG starts programming

********  OFF    ********

********  ON     ********
********  RUN    ********
   02:33:23  01/01/80

********  STOP   ********
   02:33:44  01/01/80
Run statistics    N=00004
    Min     Avg     Max
1  000.13 000.18 000.28
2  0004.7 0008.7 0012.7
3  0301.2 0301.8 0302.3
4  01.345 01.544 01.770

   02:33:45  01/01/80
RUN  starts logging
STOP stops logging
PROG starts programming

********  PROG   ********
CH3 Type(J,K,T,E,V,SKIP)
 Program volts  mX+b
m Positive? (Yes/No)
 m polarity = -
m Val? (0.00000-9.99999)
 m = -1.25000
********  EXIT   ********
********  RUN    ********
   02:35:01  01/01/80

********  STOP   ********
   02:35:20  01/01/80
Run statistics    N=00004
    Min     Avg     Max
1  000.05 000.05 000.05
2 -0000.1-0000.1-0000.1
3  0755.0 0755.8 0756.5
4  00.320 00.365 00.410

   02:35:21  01/01/80
RUN  starts logging
STOP stops logging
PROG starts programming

********  RUN    ********
   02:35:50  01/01/80

********  STOP   ********
   02:36:14  01/01/80
Run statistics    N=00005
    Min     Avg     Max
1  000.05 000.05 000.05
2 -0000.1-0000.1-0000.1
3  0730.3 0730.8 0731.5
4  00.020 00.068 00.125

   02:36:15  01/01/80
RUN  starts logging
STOP stops logging
PROG starts programming

********  OFF    ********

********  ON     ********
********  RUN    ********
   02:38:32  01/01/80

********  STOP   ********
   02:38:49  01/01/80
Run statistics    N=00003
    Min     Avg     Max
1  000.10 000.15 000.23
2 -0000.2-0000.1-0000.1
3  0476.3 0476.6 0477.4
4 -00.035-00.028-00.015

   02:38:50  01/01/80
RUN  starts logging
STOP stops logging
PROG starts programming

********  OFF    ********

********  ON     ********
********  RUN    ********
   02:40:32  01/01/80

********  STOP   ********
   02:40:50  01/01/80
Run statistics    N=00003
    Min     Avg     Max
1  005.43 005.43 005.45
2 -0000.2-0000.1-0000.1
3  0005.8 0005.9 0006.0
4 -00.430-00.428-00.425

   02:40:52  01/01/80
RUN  starts logging
STOP stops logging
PROG starts programming

********  PROG   ********
 Log Interval=00:00:05
 Full in 0000:02:25:50
Stop on full cache?(Y/N)
 Overwrite full cache
Date? [MMDDYY]
 Date=05/31/95
Time? [HHMMSS]
 Time=10:12:45
Celsius units? (Yes,No)
********  EXIT   ********
   10:12:49  05/31/95
RUN  starts logging
STOP stops logging
PROG starts programming
********  RUN    ********
   10:12:51  05/31/95

********  STOP   ********
   10:13:09  05/31/95
Run statistics    N=00003
    Min     Avg     Max
1  021.08 021.09 021.10
2 -0000.1-0000.1-0000.1
3  0005.1 0005.2 0005.3
4  00.880 00.895 00.915

   10:13:11  05/31/95
RUN  starts logging
STOP stops logging
PROG starts programming

********  RUN    ********
   10:13:28  05/31/95

********  STOP   ********
   10:13:39  05/31/95
Run statistics    N=00002
    Min     Avg     Max
1  020.98 020.99 021.00
2 -0000.1-0000.1-0000.1
3  0005.1 0005.1 0005.1
4  00.905 00.912 00.920

   10:13:41  05/31/95
RUN  starts logging
STOP stops logging
PROG starts programming
********  RUN    ********
   10:13:52  05/31/95

********  STOP   ********
   10:14:00  05/31/95
Run statistics    N=00001
    Min     Avg     Max
```

```
1  020.93 020.93 020.93
2 -0000.1-0000.1-0000.1
3  0005.1 0005.1 0005.1
4  00.900 00.900 00.900

   10:14:01  05/31/95
RUN  starts logging
STOP stops logging
PROG starts programming

********  STOP  ********
   10:14:19  05/31/95
Run statistics   N=00001
    Min     Avg     Max
1  020.93 020.93 020.93
2 -0000.1-0000.1-0000.1
3  0005.1 0005.1 0005.1
4  00.900 00.900 00.900

   10:14:20  05/31/95
RUN  starts logging
STOP stops logging
PROG starts programming

********  OFF   ********

********  ON    ********
********  RUN   ********
   10:15:23  05/31/95

********  STOP  ********
   10:47:45  05/31/95
Run statistics   N=00388
    Min     Avg     Max
1  010.25 010.66 011.10
2  0076.5 0080.6 0083.7
3  0874.9 1012.1 1164.8
4  13.835 14.822 16.150

   10:47:46  05/31/95
RUN  starts logging
STOP stops logging
PROG starts programming

********  OFF   ********

********  ON    ********
   10:50:29  05/31/95
RUN  starts logging
STOP stops logging
PROG starts programming
********  RUN   ********
   10:50:30  05/31/95

********  STOP  ********
   10:51:18  05/31/95
Run statistics   N=00009
    Min     Avg     Max
1  005.60 009.50 018.75
2 -0000.3-0000.2-0000.2
3  0009.1 0009.7 0012.6
4  00.925 01.298 02.025

   10:51:19  05/31/95
RUN  starts logging
STOP stops logging
PROG starts programming

********  OFF   ********

********  ON    ********
   10:54:01  05/31/95
RUN  starts logging
STOP stops logging
PROG starts programming
********  RUN   ********
   10:54:03  05/31/95

********  STOP  ********
   10:54:16  05/31/95
Run statistics   N=00002
    Min     Avg     Max
1  000.05 000.06 000.08
2 -0000.3-0000.3-0000.2
3  0480.6 0481.0 0481.4
4  00.595 00.607 00.620

   10:54:17  05/31/95
RUN  starts logging
STOP stops logging
PROG starts programming

********  OFF   ********

********  ON    ********
********  RUN   ********
   10:56:05  05/31/95

********  STOP  ********
   12:06:54  05/31/95
Run statistics   N=00849
    Min     Avg     Max
1  010.10 010.71 011.13
2  0074.6 0080.2 0083.7
3  0813.3 0937.0 1077.4
4  12.965 14.050 16.040

   12:06:55  05/31/95
RUN  starts logging
STOP stops logging
PROG starts programming

********  OFF   ********

********  ON    ********
********  RUN   ********
   12:14:50  05/31/95

********  STOP  ********
   12:15:00  05/31/95
Run statistics   N=00002
    Min     Avg     Max
1  021.03 021.04 021.05
2 -0001.4-0001.3-0001.3
3  0008.8 0008.8 0008.9
4  01.350 01.358 01.365

   12:15:01  05/31/95
RUN  starts logging
STOP stops logging
PROG starts programming

********  OFF   ********

********  ON    ********
********  RUN   ********
   12:18:13  05/31/95

********  STOP  ********
   12:18:34  05/31/95
Run statistics   N=00004
    Min     Avg     Max
1  000.08 000.08 000.10
2  0060.4 0060.5 0060.5
3  0008.8 0008.8 0008.9
4  00.025 00.095 00.145

   12:18:35  05/31/95
RUN  starts logging
STOP stops logging
PROG starts programming

********  OFF   ********

********  ON    ********
********  RUN   ********
   12:20:23  05/31/95

********  STOP  ********
   12:20:44  05/31/95
Run statistics   N=00004
    Min     Avg     Max
1  000.05 000.06 000.08
2 -0001.3-0000.5-0000.2
3  0472.6 0473.0 0473.4
4 -00.500-00.469-00.440

   12:20:45  05/31/95
RUN  starts logging
STOP stops logging
PROG starts programming

********  OFF   ********
```

```
********  ON     ********
********  RUN    ********
   12:22:35  05/31/95

********  STOP   ********
   12:22:51  05/31/95
Run statistics    N=00003
    Min     Avg     Max
1  021.43 021.44 021.45
2 -0001.3-0001.3-0001.3
3  0008.9 0009.0 0009.1
4  17.555 17.563 17.575

   12:22:52  05/31/95
RUN  starts logging
STOP stops logging
PROG starts programming

********  RUN    ********
   12:23:25  05/31/95

********  STOP   ********
   12:23:55  05/31/95
Run statistics    N=00006
    Min     Avg     Max
1  021.28 021.32 021.35
2 -0001.3-0001.3-0001.3
3  0008.4 0008.4 0008.5
4  19.340 19.390 19.430

   12:23:56  05/31/95
RUN  starts logging
STOP stops logging
PROG starts programming

********  RUN    ********
   12:24:20  05/31/95

********  STOP   ********
   12:24:31  05/31/95
Run statistics    N=00002
    Min     Avg     Max
1  021.25 021.25 021.25
2 -0001.3-0001.3-0001.3
3  0008.3 0008.3 0008.4
4  20.020 20.033 20.045

   12:24:33  05/31/95
RUN  starts logging
STOP stops logging
PROG starts programming

********  RUN    ********
   12:24:54  05/31/95

********  STOP   ********
   12:25:05  05/31/95
Run statistics    N=00002
```

```
    Min     Avg     Max
1  021.20 021.20 021.20
2 -0001.3-0001.3-0001.3
3  0008.1 0008.1 0008.1
4  20.645 20.645 20.645

   12:25:07  05/31/95
RUN  starts logging
STOP stops logging
PROG starts programming

********  OFF    ********

********  ON     ********
********  RUN    ********
   12:26:17  05/31/95

********  STOP   ********
   12:26:43  05/31/95
Run statistics    N=00005
    Min     Avg     Max
1  021.05 021.06 021.08
2 -0001.3-0001.3-0001.3
3  0008.0 0008.0 0008.1
4  01.055 01.226 01.380

   12:26:44  05/31/95
RUN  starts logging
STOP stops logging
PROG starts programming

********  OFF    ********

********  ON     ********
********  RUN    ********
   12:59:09  05/31/95

********  STOP   ********
   14:08:45  05/31/95
Run statistics    N=00835
    Min     Avg     Max
1  010.95 011.34 011.80
2  0074.6 0078.2 0081.8
3  0798.9 0908.1 1028.1
4  13.435 15.224 16.900

   14:08:46  05/31/95
RUN  starts logging
STOP stops logging
PROG starts programming

********  OFF    ********

********  ON     ********
********  RUN    ********
   14:10:04  05/31/95

********  STOP   ********
```

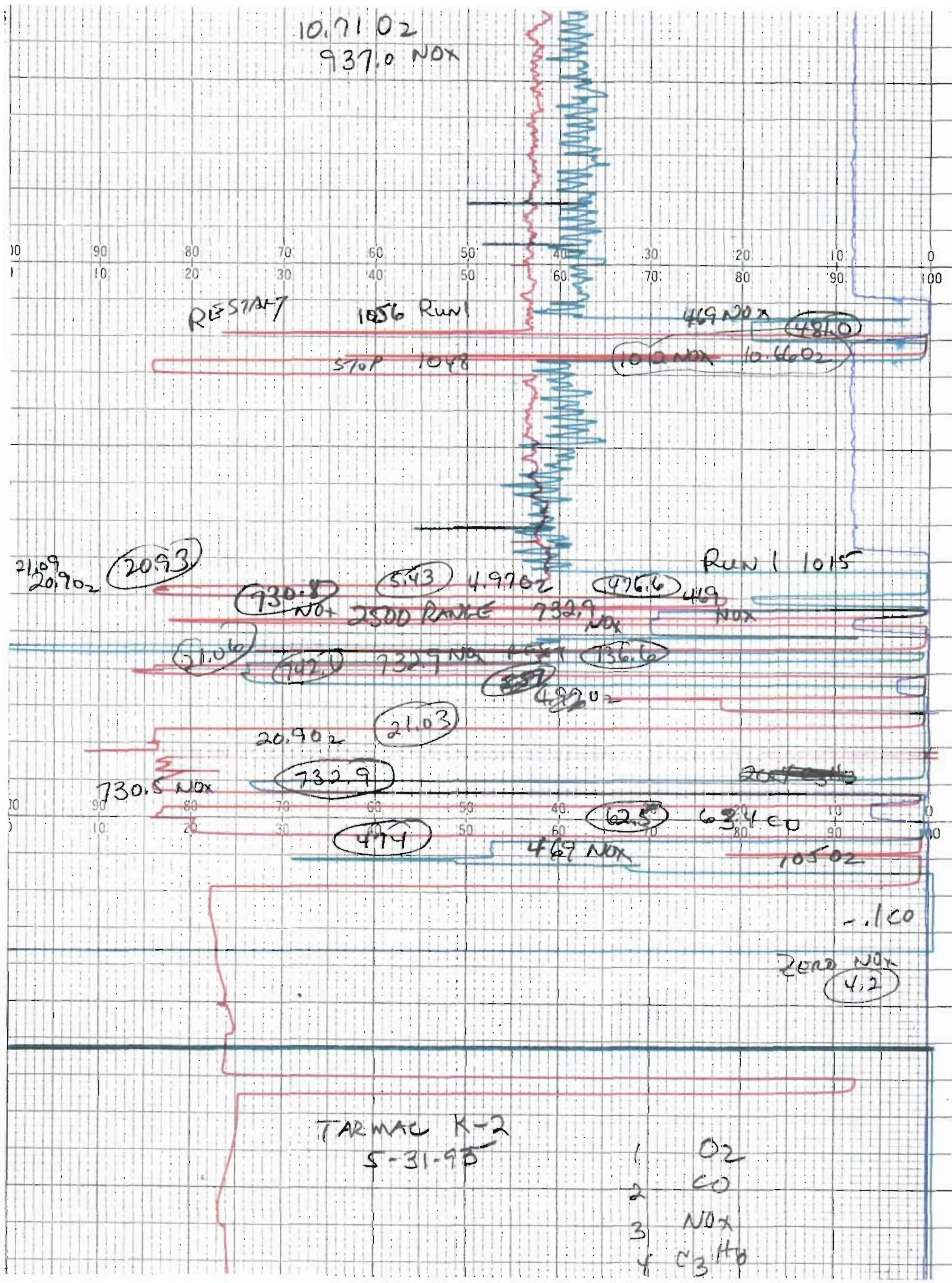
```
   14:10:19  05/31/95
Run statistics    N=00003
    Min     Avg     Max
1  021.35 021.36 021.38
2  0005.8 0009.0 0015.5
3  0021.8 0022.3 0022.8
4  03.985 04.170 04.345

   14:10:20  05/31/95
RUN  starts logging
STOP stops logging
PROG starts programming
********  STOP   ********
   14:10:29  05/31/95
Run statistics    N=00003
    Min     Avg     Max
1  021.35 021.36 021.38
2  0005.8 0009.0 0015.5
3  0021.8 0022.3 0022.8
4  03.985 04.170 04.345

   14:10:31  05/31/95
RUN  starts logging
STOP stops logging
PROG starts programming

********  STOP   ********
   14:11:18  05/31/95
Run statistics    N=00003
    Min     Avg     Max
1  021.35 021.36 021.38
2  0005.8 0009.0 0015.5
3  0021.8 0022.3 0022.8
4  03.985 04.170 04.345

   14:11:20  05/31/95
RUN  starts logging
STOP stops logging
PROG starts programming

********  OFF    ********

********  ON     ********
********  RUN    ********
   14:13:19  05/31/95

********  STOP   ********
   14:13:46  05/31/95
Run statistics    N=00005
    Min     Avg     Max
1  000.10 000.11 000.13
2 -0001.4-0001.3-0001.3
3  0496.5 0496.9 0497.3
4  00.065 00.113 00.160

   14:13:48  05/31/95
RUN  starts logging
STOP stops logging
```

```
PROG starts programming

********  OFF  ********

********  ON   ********
********  RUN  ********
   14:15:29  05/31/95

********  STOP  ********
   14:15:50  05/31/95
Run statistics   N=00004
     Min     Avg     Max
1  021.60 021.64 021.68
2 -0001.4-0001.3-0001.3
3  0012.0 0012.2 0012.4
4  01.075 01.110 01.135

   14:15:51  05/31/95
RUN  starts logging
STOP stops logging
PROG starts programming

********  OFF  ********

********  ON   ********
********  RUN  ********
   14:49:54  05/31/95

********  STOP  ********
   14:50:11  05/31/95
Run statistics   N=00003
     Min     Avg     Max
1  020.95 020.97 020.98
2  0000.7 0000.8 0000.8
3  0013.8 0013.9 0014.1
4  01.405 01.423 01.435

   14:50:12  05/31/95
RUN  starts logging
STOP stops logging
PROG starts programming

********  RUN  ********
   14:50:27  05/31/95

********  STOP  ********
   14:50:43  05/31/95
Run statistics   N=00003
     Min     Avg     Max
1  020.88 020.88 020.88
2  0000.8 0000.8 0000.8
3  0013.5 0013.5 0013.6
4  01.330 01.368 01.415

   14:50:44  05/31/95
RUN  starts logging
STOP stops logging
PROG starts programming

********  RUN  ********
   14:51:20  05/31/95

********  STOP  ********
   14:51:35  05/31/95
Run statistics   N=00003
     Min     Avg     Max
1  020.83 020.83 020.83
2 -0000.2-0000.2-0000.2
3  0016.8 0016.8 0016.9
4  01.210 01.228 01.250

   14:51:36  05/31/95
RUN  starts logging
STOP stops logging
PROG starts programming

********  RUN  ********
   14:52:03  05/31/95

********  STOP  ********
   14:52:13  05/31/95
Run statistics   N=00002
     Min     Avg     Max
1  020.95 020.95 020.95
2  0000.8 0000.8 0000.8
3  0000.4 0000.4 0000.4
4  01.075 01.088 01.100

   14:52:14  05/31/95
RUN  starts logging
STOP stops logging
PROG starts programming

********  RUN  ********
   14:52:32  05/31/95

********  STOP  ********
   14:52:52  05/31/95
Run statistics   N=00004
     Min     Avg     Max
1  020.90 020.91 020.93
2 -0000.3-0000.2-0000.2
3 -0002.5-0002.5-0002.4
4  00.950 00.957 00.975

   14:52:53  05/31/95
RUN  starts logging
STOP stops logging
PROG starts programming

********  OFF  ********

********  ON   ********
********  RUN  ********
   14:54:41  05/31/95

********  STOP  ********
   14:55:00  05/31/95
Run statistics   N=00003
     Min     Avg     Max
1  000.10 000.13 000.15
2 -0002.3-0001.9-0001.3
3  0468.8 0468.8 0468.9
4 -01.600-01.578-01.555

   14:55:01  05/31/95
RUN  starts logging
STOP stops logging
PROG starts programming

********  OFF  ********

********  ON   ********
********  RUN  ********
   14:56:22  05/31/95

********  STOP  ********
   14:56:34  05/31/95
Run statistics   N=00002
     Min     Avg     Max
1  020.95 020.96 020.98
2 -0002.3-0002.3-0002.2
3 -0005.1-0005.0-0004.9
4 -00.035-00.033-00.030

   14:56:35  05/31/95
RUN  starts logging
STOP stops logging
PROG starts programming

********  RUN  ********
   14:57:05  05/31/95

********  STOP  ********
   14:57:16  05/31/95
Run statistics   N=00002
     Min     Avg     Max
1  020.80 020.81 020.83
2 -0002.2-0002.2-0002.2
3 -0000.1-0000.1-0000.1
4 -00.085-00.070-00.055

   14:57:17  05/31/95
RUN  starts logging
STOP stops logging
PROG starts programming

********  OFF  ********

********  ON   ********
********  RUN  ********
   14:59:03  05/31/95
```

```
********  STOP  ********
   16:05:11  05/31/95
Run statistics    N=00793
    Min     Avg     Max
1  010.90 011.20 011.45
2  0075.7 0078.7 0083.7
3  0763.0 0836.2 0954.0
4  12.050 14.246 15.395

   16:05:12  05/31/95
RUN  starts logging
STOP stops logging
PROG starts programming

********  OFF   ********

********  ON    ********
********  RUN   ********
   16:06:32  05/31/95

********  STOP  ********
   16:06:53  05/31/95
Run statistics    N=00004
    Min     Avg     Max
1  020.75 020.76 020.78
2  0001.9 0005.3 0008.8
3  0007.8 0008.4 0009.3
4  04.150 04.455 04.780

   16:06:54  05/31/95
RUN  starts logging
STOP stops logging
PROG starts programming

********  OFF   ********

********  ON    ********
********  RUN   ********
   16:08:20  05/31/95

********  STOP  ********
********  PROG  ********
   16:08:46  05/31/95
 Interval=00:00:05  60Hz
 Full in 0000:02:25:50
 TadJust=+00.0F
 1 V V  -2.50000 000000
 2 V V   1.00000 000000
 3 V V  -1.25000 000000
 4 V V  -5.00000 000000
EXIT leaves program mode
OK   skips to next field
```

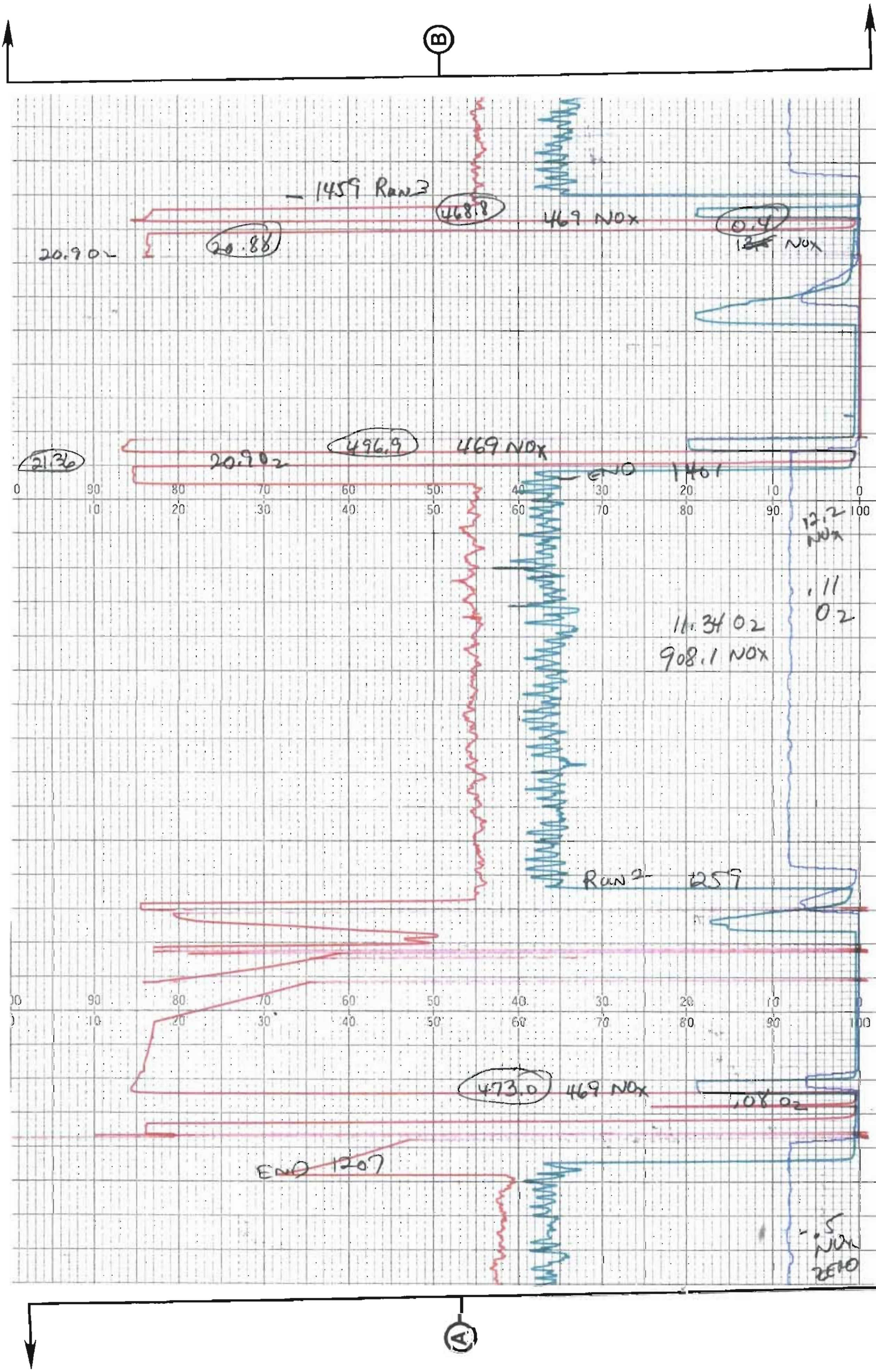
```
Select channel? (1-6)
********  EXIT  ********
********  RUN   ********
   16:09:04  05/31/95

********  STOP  ********
   16:09:17  05/31/95
Run statistics    N=00003
    Min     Avg     Max
1  000.08 000.08 000.08
2 -0002.2-0002.2-0002.2
3  0490.4 0490.8 0491.1
4  01.105 01.120 01.130

   16:09:19  05/31/95
RUN  starts logging
STOP stops logging
PROG starts programming

********  OFF   ********

********  ON    ********
********  RUN   ********
   16:11:49  05/31/95

********  STOP  ********
   16:12:06  05/31/95
Run statistics    N=00003
    Min     Avg     Max
1  000.05 000.05 000.05
2  0059.6 0059.6 0059.7
3  0002.5 0002.5 0002.5
4  00.350 00.387 00.420

   16:12:08  05/31/95
RUN  starts logging
STOP stops logging
PROG starts programming

********  OFF   ********

********  ON    ********
********  RUN   ********
   16:13:29  05/31/95

********  STOP  ********
   16:13:50  05/31/95
Run statistics    N=00004
    Min     Avg     Max
1  021.30 021.34 021.38
2  0001.9 0005.8 0009.8
3  0001.0 0001.0 0001.1
4  20.870 20.895 20.920

   16:13:51  05/31/95
RUN  starts logging
STOP stops logging
```

A



AIR CONSULTING & ENGINEERING, INC.

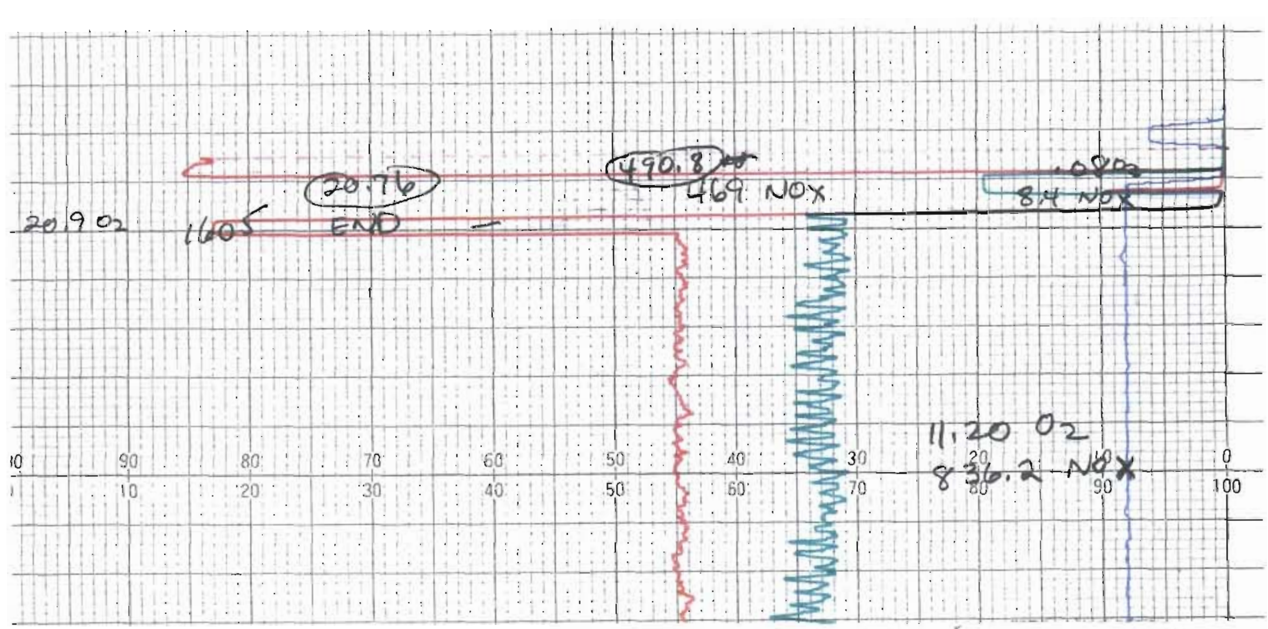
START



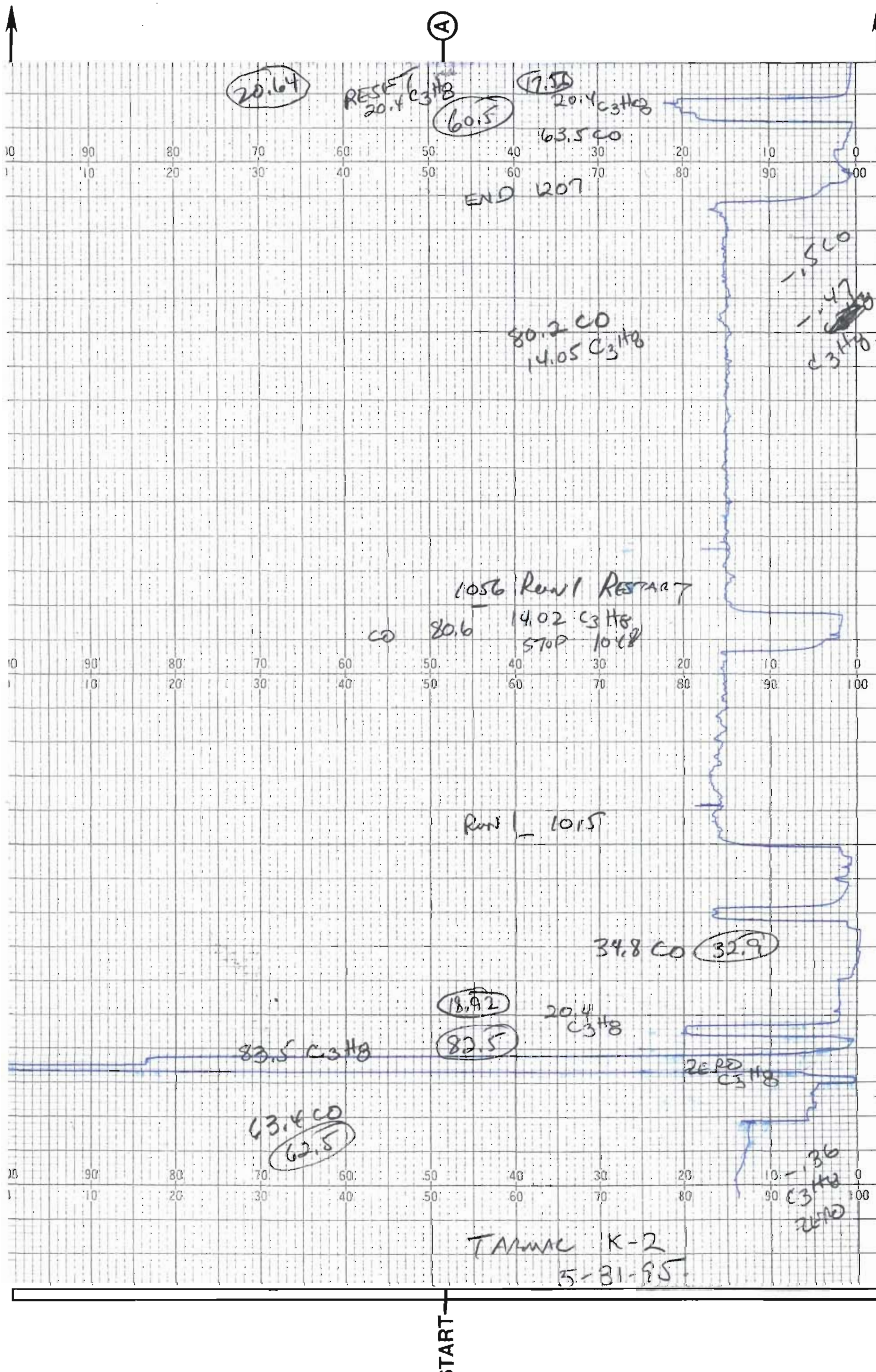
AIR CONSULTING & ENGINEERING, INC.

END

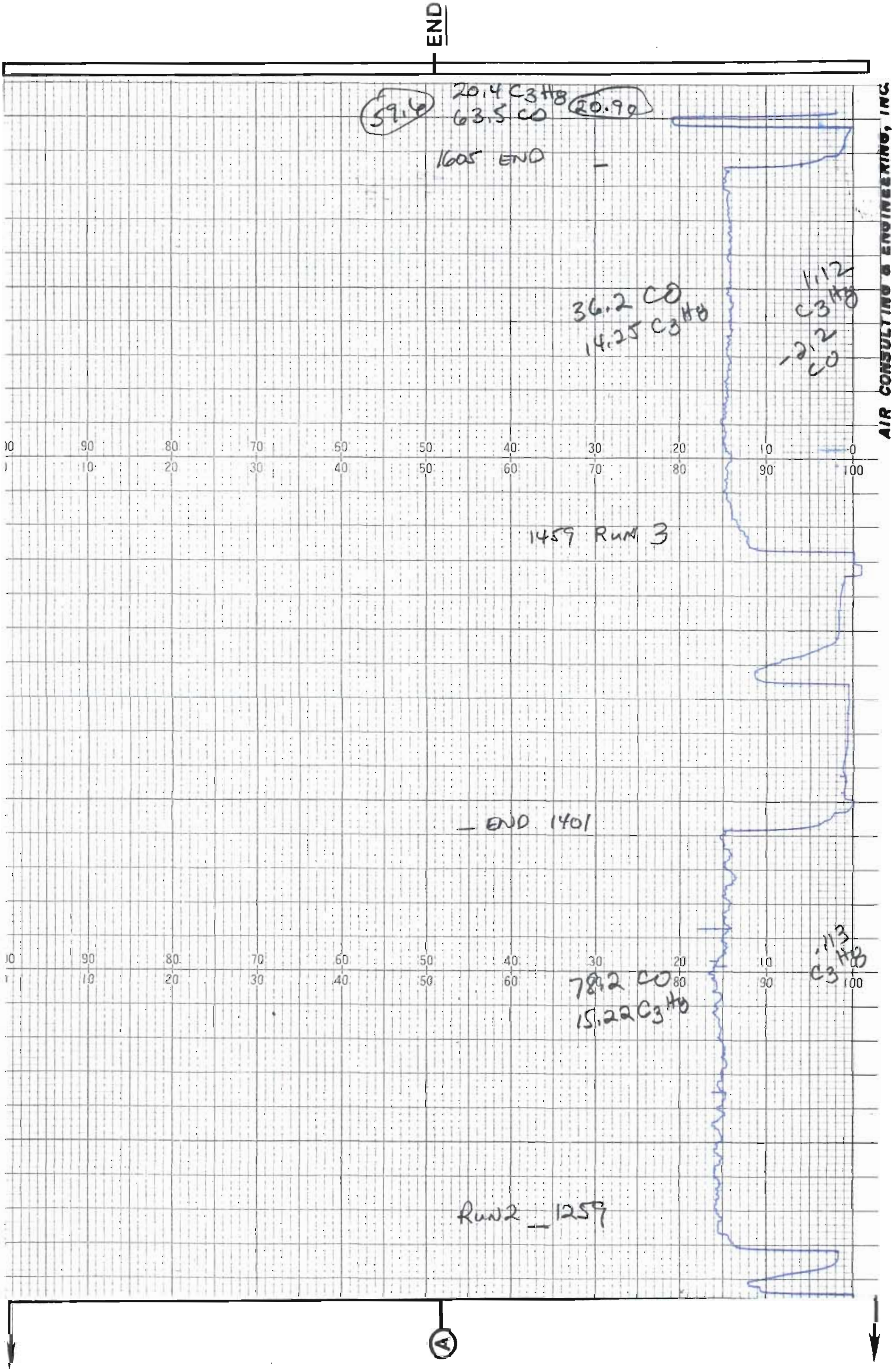
AIR CONSULTING & ENGINEERING, INC.



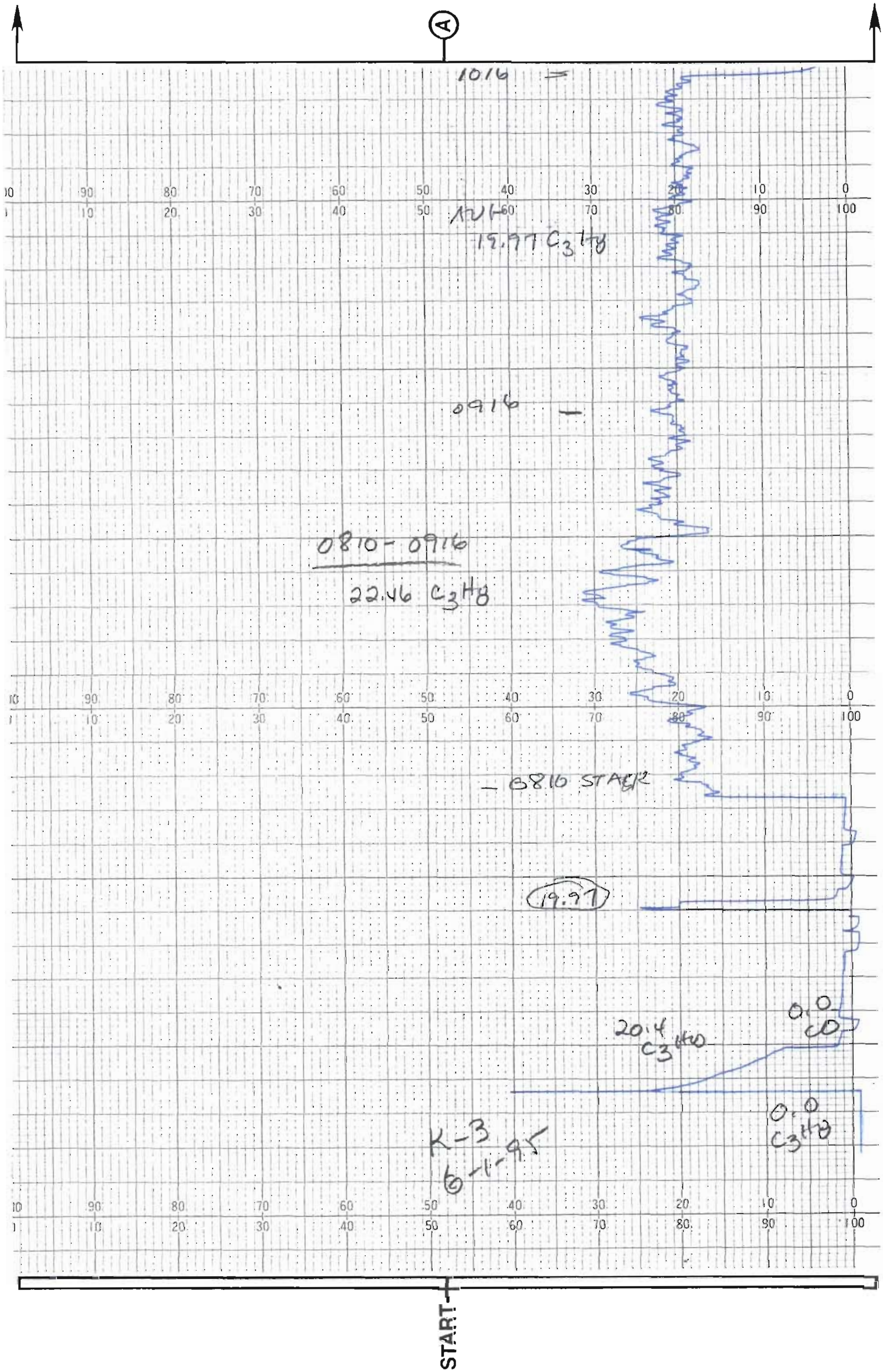
B



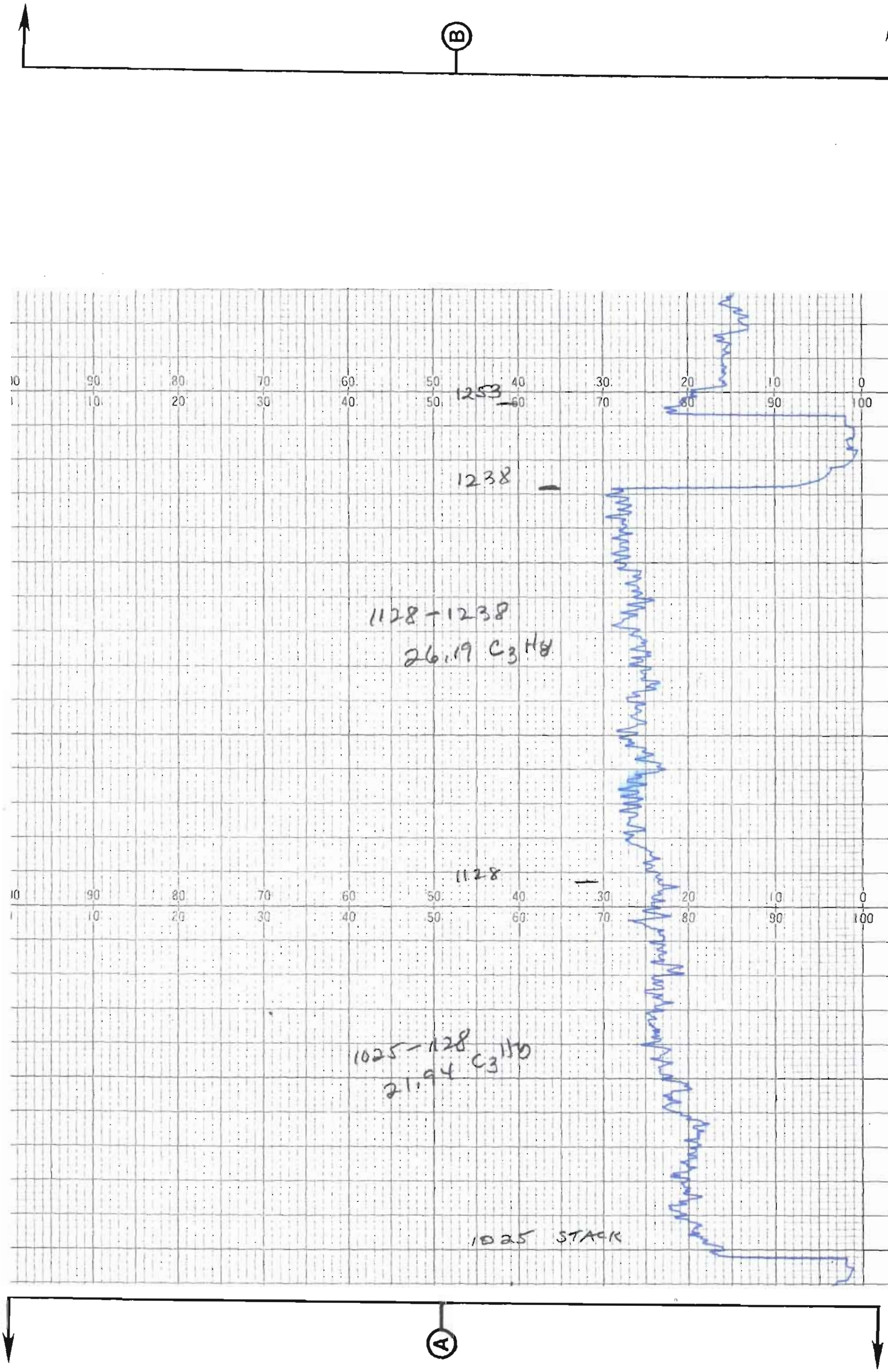
AIR CONSULTING & ENGINEERING, INC.



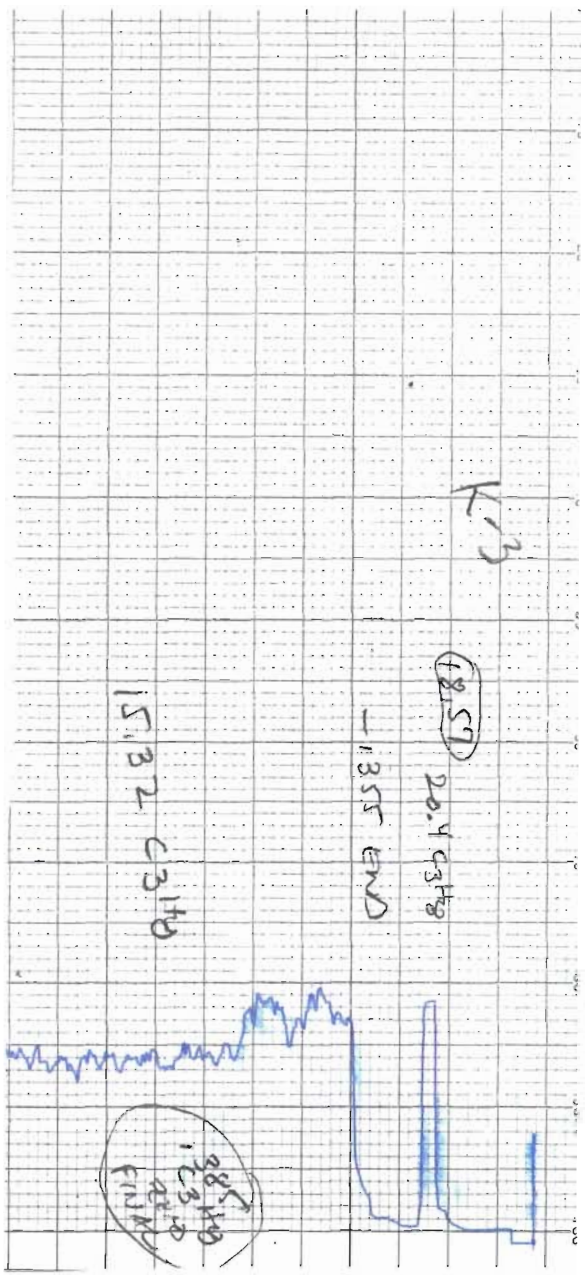
END
20.4 C3H8
63.5 CO
59.4
20.90
1605 END
36.2 CO
14.25 C3H8
1.12 C3H8
-2.2 CO
1459 RUN 3
END 1401
78.2 CO
15.22 C3H8
.113 C3H8
RUN2 1259
AIR CONSULTING & ENGINEERING, INC
A



AIR CONSULTING & ENGINEERING, INC.



AIR CONSULTING & ENGINEERING, INC.



B

END

AIR CONSULTING & ENGINEERING, INC.

APPENDIX E

QUALITY ASSURANCE
AND
CHAIN OF CUSTODY

STANDARD METER CALIBRATION
Meter Number 1040616 - S

Air Consulting and Engineering, Inc. (ACE) uses a dry gas meter for the calibration standard. This meter has been calibrated against a wet test meter in triplicate. This data was used to generate a standard meter calibration curve (see next page). Field meter calibrations are corrected to this curve using the following formula:

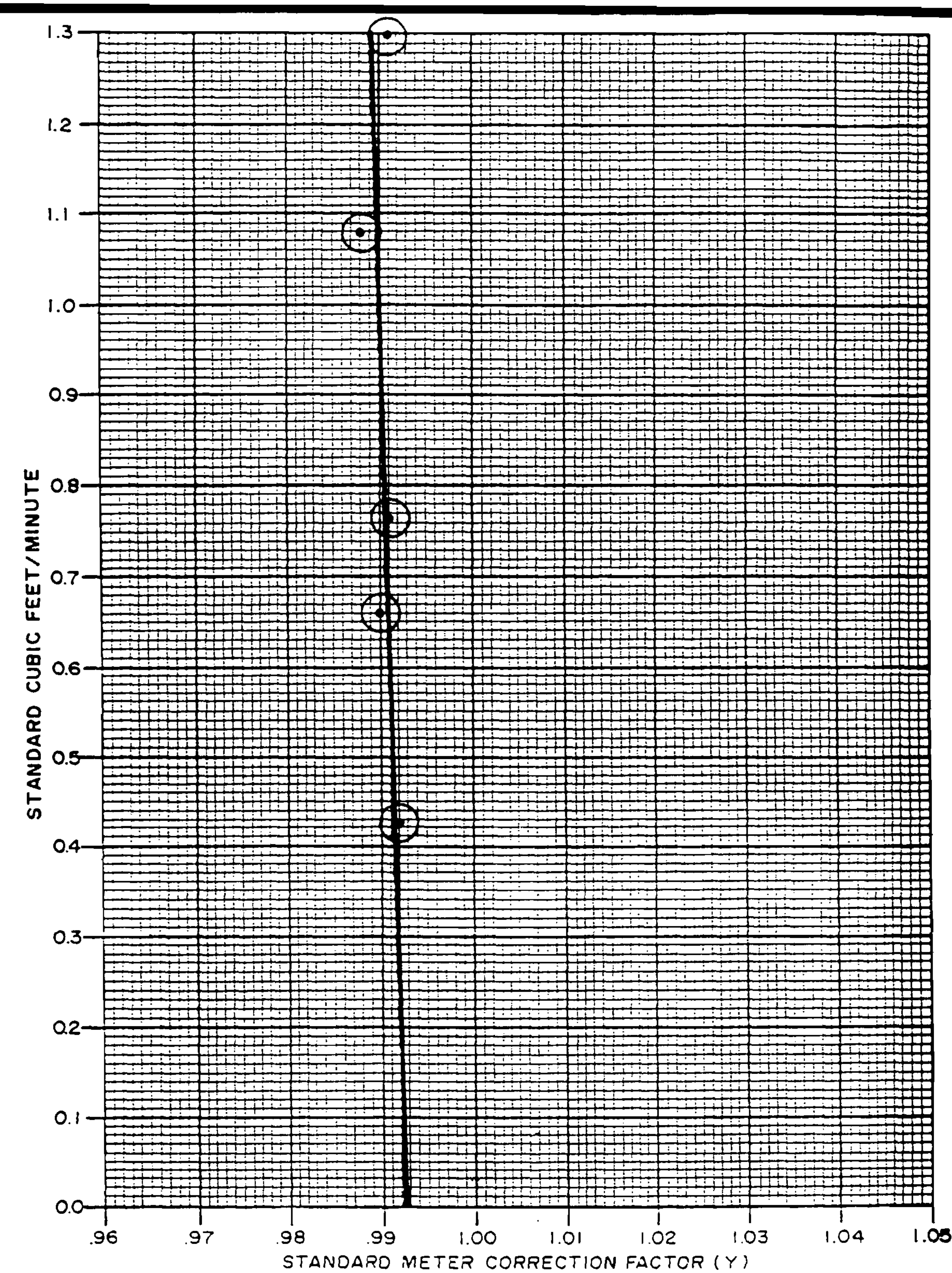
$Y_a \times Y_s = Y$

Y_a = actual ratio of field meter to standard meter

Y_s = ratio of standard meter to wet test meter at a given flow rate (from Calibration Curve)

Y = corrected ratio of field meter

The dry standard meter was calibrated on July 12, 1993, and has been rechecked and verified annually. The latest verification was August 22, 1994.



STANDARD METER CALIBRATION CURVE JULY 12, 1993 - SERIAL NO. 1040616 (SOUTH) NOTE: CALIBRATED AGAINST 1 FT / REV. WET TEST METER AT ESE, INC.	AIR CONSULTING and ENGINEERING

AIR CONSULTING & ENGINEERING — STANDARD METER CALIBRATION

DATE 7-12-93

LEAK CHECK 0.000 CFM at 12 In. Hg.

METER SERIAL NUMBER 1040616 (SOUTh)

BAROMETRIC PRESSURE 30.16 In. Hg.

STD GAS METER TEMPERATURE 76 °F/ ASTM GLASS THERMOMETER TEMPERATURE 76 °F

WET ΔH	STD ΔH	GAS VOLUME, WET TEST METER INITIAL	GAS VOLUME, WET TEST METER FINAL	GAS VOLUME, WET TEST METER ACTUAL ft^3	GAS VOLUME, STD GAS METER INITIAL	GAS VOLUME, STD GAS METER FINAL	GAS VOLUME, STD GAS METER ACTUAL ft^3	TEMP. WET TEST METER (°F)	TEMP. OF STD. METER (°F)	TIME (Minutes)
-.3	-.63	0.000	5.100	5.100	761.399	766.552	5.153	75	78	12
-.3	-.63	0.000	5.110	5.110	766.552	771.718	5.166	75	76	12
-.3	-.63	0.000	5.093	5.093	771.718	776.873	5.155	75	76	12
-.4	-1.2	0.000	5.298	5.298	777.783	783.158	5.375	75	76	8
-.4	-1.2	0.000	5.299	5.299	783.158	788.538	5.380	75	76	8
-.4	-1.2	0.000	5.297	5.297	788.538	793.914	5.376	75	76	8
-.5	-1.5	0.000	5.002	5.002	719.913	725.008	5.095	74	76	6.50
-.5	-1.5	0.000	7.001	7.001	725.009	735.113	7.104	74	76	9.05
-.5	-1.5	0.000	5.012	5.012	732.113	737.203	5.090	75	76	6.62
-.7	-2.4	0.000	6.517	6.517	796.774	803.417	6.643	75	76	6
-.7	-2.4	0.000	5.424	5.424	803.417	808.959	5.543	75	76	5
-.7	-2.4	0.000	5.422	5.422	808.959	814.492	5.533	75	76	5
-.95	-2.7	0.000	5.710	5.710	740.453	746.259	5.796	75	76	5
-.95	-2.7	0.000	5.694	5.694	746.259	752.053	5.794	75	76	5
-.95	-2.7	0.000	5.690	5.690	753.647	759.444	5.797	75	75	6

CALIBRATED BY: [illegible]

	Y	SCFMD	Y	SCFMD	Y	SCFMD	Y	SCFMD	Y	SCFMD
1	0.993	0.423	0.990	0.659	0.989	0.767	0.989	1.081	0.994	1.136
2	0.993	0.424	0.990	0.659	0.993	0.771	0.986	1.079	0.991	1.133
3	0.991	0.422	0.990	0.659	0.990	0.753	0.988	1.079	0.988	1.132
AVG	0.992	0.424	0.990	0.659	0.991	0.764	0.988	1.080	0.991	1.134

air consulting and engineering

NOTE: CALIBRATED AGAINST 1 FT^3/REV. WET TEST METER AT ESE

AIR CONSULTING & ENGINEERING — STANDARD METER CALIBRATION

DATE 8-23-94

LEAK CHECK 0.000 CFM at 9 In. Hg.

METER SERIAL NUMBER 1040616

BAROMETRIC PRESSURE 30.14 In. Hg.

STD GAS METER TEMPERATURE 73 °F/ ASTM GLASS THERMOMETER TEMPERATURE 73 °F

WET ΔH	STD ΔH	GAS VOLUME, WET TEST METER			GAS VOLUME, STD GAS METER			TEMP WET TEST METER (°F)	TEMP OF STD METER (°F)	TIME (Minutes)
		INITIAL	FINAL	ACTUAL ft^3	INITIAL	FINAL	ACTUAL ft^3			
-.02	-1.4	0.000	5.877	5.877	581.660	587.649	5.989	73	76	17
-.75	-8.8	0.000	6.021	6.021	575.283	581.583	6.300	73	75	6

CALIBRATED BY: [signature]

SCFM	Y Old Value	Y New Value	% Change
0.345	0.992	0.990	0.20
1.001	0.990	0.980	1.01

air consulting and engineering

AIR CONSULTING & ENGINEERING — ANNUAL METER CALIBRATION

DATE 12-23-94

LEAK CHECK 0.000 CFM at 15 in. Hg

METER BOX NUMBER 6

BAROMETRIC PRESSURE 30.15 in. Hg

DRY GAS METER TEMPERATURE 68 °F/ASTM GLASS THERMOMETER TEMPERATURE 68 °F

ΔHS	AVERAGE ΔHD	GAS VOLUME, STANDARD METER			GAS VOLUME, DRY GAS METER			TEMP STD METER	TEMP OF DRY METER	TIME (Minutes)	TIMER
		INITIAL	FINAL	ACTUAL ft^3	INITIAL	FINAL	ACTUAL ft^3				
-.4	0.5	963.700	968.700	5.000	138.236	143.161	4.924	68	68	12:24	12.40
-.57	1.0	969.400	974.400	5.000	143.854	148.777	4.923	69.5	69.5	9:00	9.0
-.75	1.5	975.900	986.475	10.575	150.257	160.700	10.443	71.2	72.2	15:27	15.45
-.90	2.0	987.100	998.604	11.504	161.318	172.711	11.393	71.7	74.5	14:39	14.65
-1.10	3.0	000.100	010.100	10.000	174.200	184.185	9.985	73	75	10:30	10.5
-1.65	5.0	013.860	023.200	10.000	187.280	197.830	10.050	68	75	8:21	8.35

	DELTA H	Ya	SCFM	Ym	Y
	1.663	1.014	0.412	0.992	1.006
	1.804	1.013	0.558	0.991	1.004
	1.743	1.011	0.694	0.991	1.001
	1.740	1.010	0.800	0.991	1.001
	1.777	0.998	0.969	0.990	0.988
	1.846	0.996	1.227	0.989	0.985
MEAN:	1.762	1.007		0.990	0.997

CALIBRATED BY: Gerard P Gautheau

AIR CONSULTING & ENGINEERING, inc. POST TEST CALIBRATION

DATE 7/12/95 METER BOX NUMBER 6 LEAK CHECK 0.000 CFM at 15.0 in. Hg.

CLIENT Tarmac SOURCE K-2 THERMOCOUPLE NUMBER ____ PYROMETER NUMBER ____

FLIGHT SERVICE Pb ____ in. Hg. ACE BAROMETER Pb 30.01 in. Hg.

ASTM GLASS THERMOMETER ____ °F / THERMOCOUPLE ____ °F ASTM GLASS THERMOMETER ____ °F / METER TEMP ____ °F

ΔHS	AVERAGE ΔHD	GAS VOLUME, STANDARD METER			GAS VOLUME, DRY GAS METER			TEMP STANDARD METER	TEMP OF DRY METER	TIME (Minutes)	MAX. VACUUM In. Hg
		INITIAL	FINAL	ACTUAL ft^3	INITIAL	FINAL	ACTUAL ft^3				
-.39	.461	145.275	155.049	9.774	514.833	524.833	10.000	80	93	24.9	5.0
-.39	.461	155.049	164.778	9.729	524.833	534.833	10.000	80	94	25.6	5.0
-.39	.461	164.778	174.470	9.692	534.833	544.833	10.000	81	96	25.8	5.0

CALIBRATED BY: [signature]

	DELTA H	Ya	SCFM	Ys	Y
	1.667	1.000	0.385	0.994	0.994
	1.775	0.997	0.373	0.994	0.991
	1.816	0.995	0.368	0.994	0.989
MEAN:	1.753	0.997		0.994	0.992

Air Consulting and Engineering

07/12/1995 12:49 4077912611 ACE PAGE 01

AIR CONSULTING & ENGINEERING, INC. — PITOT TUBE CALIBRATION

DATE CALIBRATED 4-7-95

PITOT TUBE 73

IS PITOT TUBE ASSEMBLY LEVEL yes

ARE PITOT TUBE OPENINGS DAMAGED no

α_1 = 0 °(< 10°), α_2 = 1 °(< 10°), β_1 = 4 °(<5°), β_2 = 0 °(<5°)

γ = 1 ° θ = 2 ° A = .9999 in. = (Pa + Pb)

z = A sin γ = .017 in.; <0.32/<1/8 in.

w = A sin θ = .035 in.; <0.08/<1/32 in.

P_a .4990 in. P_b .5009 in. D_t .375

WAS CALIBRATION REQUIRED no

THERMOCOUPLE CALIBRATION

SOURCE (SPECIFY)	ASTM GLASS THERMOMETER WITH MERCURY (°F)	PYROMETER (°F)	DEGREE DIFFERENCE	PERCENT DIFFERENCE
ICE BATH	36	38	2	.40
AMBIENT	87	88	1	.18
HOT OVEN	436	439	3	.34

CALIBRATED BY: Sid Carter

FDER - MAXIMUM 5° DIFFERENCE

EPA $\left[\frac{(\text{REF. TEMP. °F} + 460°) - (\text{PYROMETER TEMP. °F} + 460°)}{\text{REF. TEMP. °F} + 460°}\right] 100 \leq 1.5\%$

AIR CONSULTING & ENGINEERING, INC. PYROMETER CALIBRATION

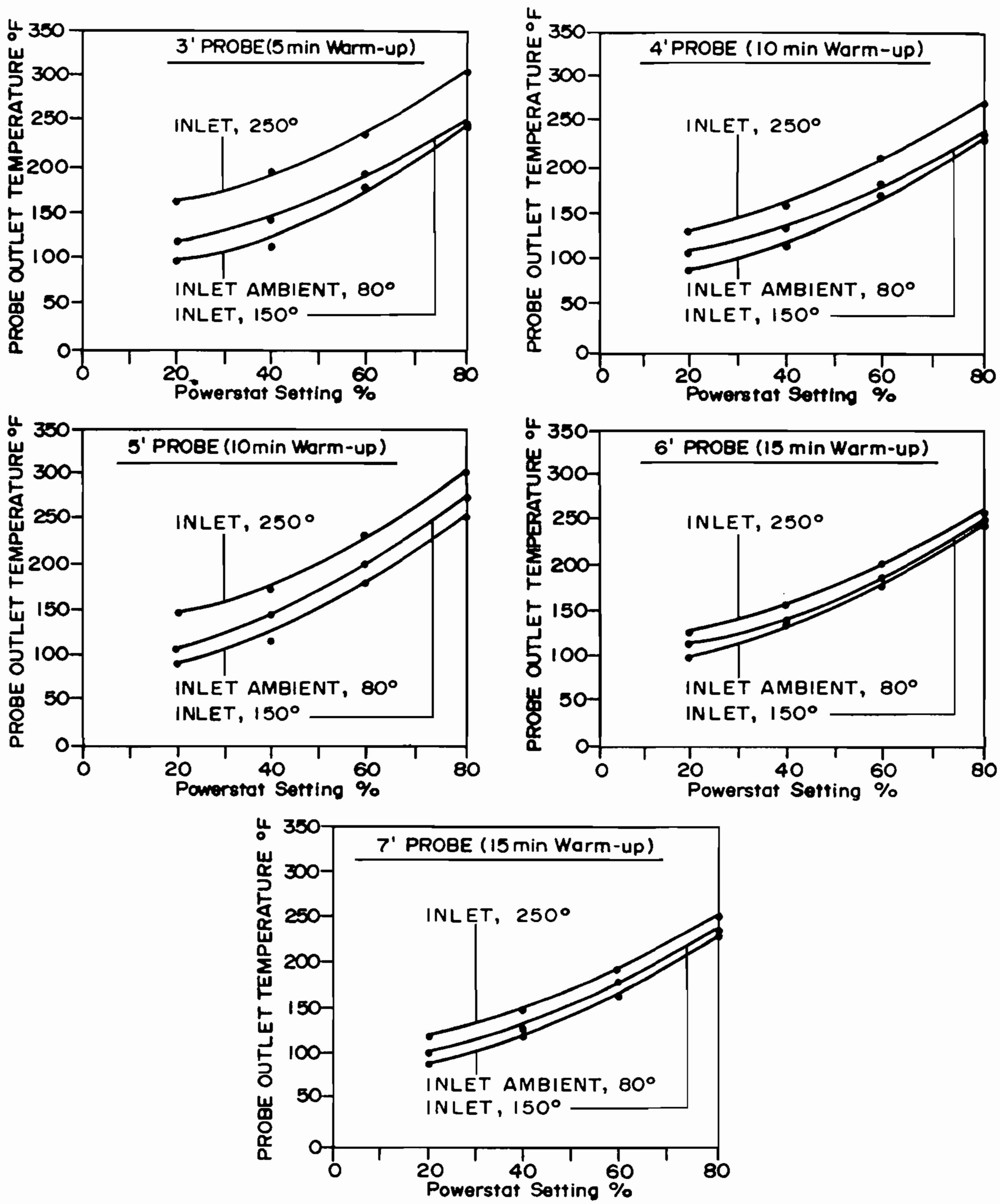
DATE 6/22/94 PYROMETER NUMBER Atkin's #3

SOURCE (SPECIFY)	GLASS THERMOMETER WITH NBS MERCURY (°F)	PYROMETER (°F)	DEGREE DIFFERENCE	PERCENT DIFFERENCE
ICE BATH	32	32	0	0
AMBIENT	82	83	1	0.2
HOT OVEN	400	404	4	0.8

FDER - MAXIMUM 5° DIFFERENCE

EPA $\left[\frac{(\text{REF. TEMP. °F} + 460°) - (\text{PYROMETER TEMP. °F} + 460°)}{\text{REF. TEMP. °F} + 460°}\right] 100 \leq 1.5\%$

CALIBRATED BY: Gerard Gauthreaux



NOTE: Flow rate held constant at 0.75; 50% change in flow rate has little effect on probe temperature.

PROBE GRAPH	AIR CONSULTING and ENGINEERING

AIR CONSULTING AND ENGINEERING, Inc.

SAMPLE RECOVERY AND CHAIN OF CUSTODY

PLANT NAME TARMAC　　TEST DATE 5.31.95

SOURCE NAME CEMENT KILN 2　　SAMPLE RECOVERED BY CH

TYPE OF SAMPLE PARTICULATE　　PARTICULATE ANALYSES BY MS

SAMPLE RECOVERY

RUN NO.	CONTAINER NO.	LIQUID LEVEL MARKED	COLOR	COMMENTS
1	6293	NA	Beige	0.4046
2	6295	↓	↓	0.4142
3	6291	↓	↓	0.4028
1	28	✓	none	255.7
2	46	✓	↓	272.3
3	75	✓	↓	297.7
ACETONE / WATER BLANK (CIRCLE)				
FILTER BLANK				

SILICA GEL

RUN NO.	CONTAINER NO.	FINAL WT. (g)	INIT. WT. (g)	NET WT. (g)	COLOR
1	10	209.8	200.0	9.8	Blue/Pink
2	192	244.3	200.0	44.3	↓
3	79	222.2	200.0	22.2	↓
			200.0		
			200.0		
			200.0		
			200.0		
			200.0		

CONTINUOUS MONITOR ACCURACY CERTIFICATION

ACE AIR CONSULTING & ENGINEERING, INC.
2106 N.W. 67th PLACE · Suites 9 & 10
GAINESVILLE, FLORIDA · 32606
(904) 335-1889

PLANT: TARMAC FLORIDA
SOURCE: @ K-2
DATE: 5-31-95
PAGE 1 OF 1

2000 RANGE

NO_x CALIBRATION GAS	MONITOR VALUE ppm	DIFFERENCE ppm	% SPAN
730.5	732.9	2.4	0.12
469	474	5	0.25
ZERO	4.2	4.2	0.21

O_2 CALIBRATION GAS	MONITOR VALUE ppm	DIFFERENCE ppm	% SPAN

CO CALIBRATION GAS	MONITOR VALUE ppm	DIFFERENCE ppm	% SPAN

BEST AVAILABLE COPY

NATIONAL SPECIALTY GASES
630 UNITED DRIVE
DURHAM, NC 27713
(919)544-3772

CERTIFICATE OF ANALYSIS-EPA PROTOCOL MIXTURES

REFERENCE #: 88-31469 CYLINDER #:CC71434 CYL. PRESSURE:2000PSIG
EXPIRATION DATE: 5/25/96 LAST ANALYSIS DATE:5/25/94
CUSTOMER: CRYOTECH P.O.# 275659

METHOD: ANALYZED ACCORDING TO EPA TRACEABILITY PROTOCOL FOR ASSAY AND CERTIFICATION OF GASEOUS CALIBRATION STANDARDS-SEPTEMBER 1993:G-1

STANDARD:	INSTRUMENT:BECKMAN CHEMILUMINESCENT
SRM #:2735	MODEL #:951A
CYL #:ALM365	SERIAL #:0101572
CONC.:795PPM	LAST CAL.:5/2/94

728 + 2.46 = 730.5

COMPONENT:NO		COMPONENT: NO2		COMPONENT:	
MEAN CONC:728PPM		MEAN CONC: 2.46PPM		MEAN CONC:	
REPLICATE CONC.		REPLICATE CONC.		REPLICATE CONC.	
DATE:5/18/94	DATE:5/25/94	DATE:	DATE:	DATE:	DATE:
726PPM	730PPM				
727PPM	729PPM				
728PPM	731PPM				

BALANCE GAS:N2

REPLICATE DATA COMPONENT:NO

DATE: 5/18/94						DATE:5/25/94					
Z	0	R	523	C	477.6	Z	0	R	511	C	469.2
R	522	Z	0	C	477.4	R	511	Z	0	C	468.6
Z	0	C	478	R	522	Z	0	C	468.9	R	510

REPLICATE DATA COMPONENT:

DATE:			DATE:		
Z	R	C	Z	R	C
R	Z	C	R	Z	C
Z	C	R	Z	C	R

REPLICATE DATA COMPONENT:

DATE:			DATE:		
Z	R	C	Z	R	C
R	Z	C	R	Z	C
Z	C	R	Z	C	R

Z=ZERO C=CANDIDATE R=REFERENCE

ANALYST: [signature] APPROVED BY: [signature]

NATIONAL SPECIALTY GASES
630 UNITED DRIVE
DURHAM, NC 27713
(919)544-3772

CERTIFICATE OF ANALYSIS-EPA PROTOCOL MIXTURES

REFERENCE #: 88-34599 CYLINDER #:CC35983 CYL. PRESSURE:2000PSIG
EXPIRATION DATE:10/21/96 LAST ANALYSIS DATE:10/21/94
CUSTOMER: CRYOTECH P.O.# 2360

METHOD: ANALYZED ACCORDING TO EPA TRACEABILITY PROTOCOL FOR ASSAY AND CERTIFICATION OF GASEOUS CALIBRATION STANDARDS-SEPTEMBER 1993:G-1

STANDARD:	INSTRUMENT:BECKMAN CHEMILUMINESCENT
SRM #: 1686B	MODEL #:951A
CYL #: CLM4860	SERIAL #:0100532
CONC.: 492PPM	LAST CAL.:10/3/94

COMPONENT:NO	NO2	COMPONENT:		COMPONENT:	
MEAN CONC:469PPM	<0.1PPM	MEAN CONC:		MEAN CONC:	
REPLICATE CONC.		REPLICATE CONC.		REPLICATE CONC.	
DATE:10/14/94	DATE:10/21/94	DATE:	DATE:	DATE:	DATE:
471PPM	468PPM				
471PPM	467PPM				
472PPM	467PPM				

BALANCE GAS:N2

REPLICATE DATA COMPONENT:NO

DATE: 10/14/94						DATE:10/21/94					
Z	0	R	447.0	C	427.9	Z	0	R	446.5	C	424.7
R	447.0	Z	0	C	427.9	R	446.0	Z	0	C	423.3
Z	0	C	429.3	R	447.5	Z	0	C	423.3	R	446.0

REPLICATE DATA COMPONENT:

DATE:						DATE:					
Z		R		C		Z		R		C	
R		Z		C		R		Z		C	
Z		C		R		Z		C		R	

REPLICATE DATA COMPONENT:

DATE:						DATE:					
Z		R		C		Z		R		C	
R		Z		C		R		Z		C	
Z		C		R		Z		C		R	

Z=ZERO C=CANDIDATE R=REFERENCE

ANALYST: B. G. Moore APPROVED BY: Jim Rowe

APPENDIX F

PRODUCTION DATA

APPENDIX G

FDEP PERMIT NUMBER AC13-169901

Florida Department of Environmental Regulation
Twin Towers Office Bldg. • 2600 Blair Stone Road • Tallahassee, Florida 32399-2400
Lawton Chiles, Governor
Carol M. Browner, Secretary

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

Permit Number: AC 13-169901
PSD-FL-142
Expiration Date: June 30, 1992
County: Dade
Latitude/Longitude: 25°52'30"N
80°22'30"W
Project: Kiln No. 2 Coal Conversion

This permit is issued under the provisions of Chapter 403, Florida Statutes, and Florida Administrative Code Chapters 17-2 and 17-4. The above named permittee is hereby authorized to perform the work or operate the facility shown on the application and approved drawing(s), plans, and other documents attached hereto or on file with the Department and made a part hereof and specifically described as follows:

For the conversion of kiln No. 2 to coal firing. The project will be located at the permittee's existing facility in Medley, Dade County, Florida. The UTM coordinates are Zone 17, 562.8 km East and 2861.7 km North.

The source shall be constructed in accordance with the permit application, plans, documents, amendments and drawings, except as otherwise noted in the General and Specific Conditions.

Attachments are listed below:

1. Application to construct received September 5, 1989.
2. DER's letter of incompleteness dated October 4, 1989.
3. EPA's letter dated October 18, 1989.
4. KBN's response (to incompleteness letter) dated November 13, 1989.
5. Dade County DERM's letter dated November 17, 1989.
6. EPA's letter dated December 13, 1989.
7. KBN's letter dated December 21, 1989.
8. KBN's letter dated January 15, 1990.
9. KBN's letter dated January 30, 1990.
10. EPA's letter dated March 20, 1990.
11. EPA's letter dated April 13, 1990.
12. Dade County DERM's letter dated April 30, 1990.
13. NPS's letter dated May 30, 1990.

GENERAL CONDITIONS:

b. The permittee shall hold at the facility or other location designated by this permit records of all monitoring information (including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation) required by the permit, copies of all reports required by this permit, and records of all data used to complete the application for this permit. These materials shall be retained at least three years from the date of the sample, measurement, report, or application unless otherwise specified by Department rule.

c. Records of monitoring information shall include:

- the date, exact place, and time of sampling or measurements;
- the person responsible for performing the sampling or measurements;
- the dates analyses were performed;
- the person responsible for performing the analyses;
- the analytical techniques or methods used; and
- the results of such analyses.

15. When requested by the Department, the permittee shall within a reasonable time furnish any information required by law which is needed to determine compliance with the permit. If the permittee becomes aware that relevant facts were not submitted or were incorrect in the permit application or in any report to the Department, such facts or information shall be corrected promptly.

SPECIFIC CONDITIONS:

1. The construction and operation of the subject modification of kiln No. 2 shall be in accordance with the capacities and specifications stated in the application.

2. The maximum clinker production rate of kiln No. 2 shall not exceed 25 tons per hour and 197,100 tons per year. Kiln No. 2 shall operate only on coal firing for up to 7,884 hours per year at a maximum firing rate of 162.5 MMBtu per hour. The coal used for firing kiln No. 2 shall have a maximum sulfur content of 2.0 percent by weight, with the rolling 30-day average sulfur content not exceeding 1.75 percent by weight.

3. Sulfur dioxide emissions from kiln No. 2 shall not exceed 7.8 lbs/ton of clinker produced, 195.0 lbs/hr, 768.7 tons/yr.

SPECIFIC CONDITIONS:

4. Sulfuric acid mist emissions from kiln No. 2 shall not exceed 0.23 lb/ton of clinker produced, 5.86 lbs/hr, 23.06 tons/yr.

5. Nitrogen oxides emissions from kiln No. 2 shall not exceed 4.55 lbs/ton of clinker produced, 113.8 lbs/hr, 448.4 tons/yr.

6. Carbon monoxide emissions from kiln No. 2 shall not exceed 346 lbs/hr, 1363.9 tons/yr.

7. VOC emissions from kiln No. 2 shall not exceed 28.8 lbs/hr, 113.5 tons/yr.

8. Particulate matter emissions from kiln No. 2 shall not exceed 14.40 lbs/hr, 56.76 tons/yr.

9. PM_{10} emissions from kiln No. 2 shall not exceed 12.24 lbs/hr, 48.25 tons/yr. Compliance for PM_{10} shall be determined by applying a factor of 0.85 to the measured particulate matter emissions.

10. All reasonable precautions that apply under F.A.C. Rule 17-2.610(3) shall be implemented to limit unconfined emissions of particulate matter from any activity associated with this project. Adequate watering of the coal pile area shall be conducted whenever visible emissions occur in that area. The frequency of watering shall be no more than every half hour.

11. Initial and annual compliance tests shall be conducted using the following test methods:

EPA Method 5 for particulate matter
EPA Method 7 for nitrogen oxides
EPA Method 8 for sulfur dioxide and acid mist
EPA Method 25 for VOC
EPA Method 10 for carbon monoxide

12. Tarmac shall conduct a series of compliance tests for SO_2, H_2SO_4 mist, and NO_x emissions every two months for up to one year to allow representative sampling during different times of the year. The tests shall be performed in accordance with the compliance test methods specified in this permit. In the event that this series of tests results in SO_2 emissions in the range of 195 to 275 lbs/hr (up to 11 lbs/ton clinker, 1,084.1 TPY), NO_x emissions in the range of 113.8 to 169.3 lbs/hr (up to 6.77 lbs/ton clinker, 667.2 TPY), or H_2SO_4 mist emissions in the range

SPECIFIC CONDITIONS:

of 5.86 to 8.25 lbs/hr (up to 0.33 lbs/ton clinker, 32.52 TPY), the Department, if requested by the permittee, shall re-evaluate BACT and consider upward adjustments of the emission limitations for the indicated constituents based on available data. During this testing and evaluation period, the permittee shall make reasonable efforts to limit air emissions, and the Department shall not initiate enforcement proceedings. Any upward adjustment of emission limitations pursuant to this paragraph shall be the subject of public notice in a local newspaper pursuant to Department rules. The Department's determination based on the data produced under this paragraph shall be a point of entry for purposes of Section 120.57, Florida Statutes.

13. The compliance tests shall be conducted within 30 days after operation on coal begins. The Department's Southeast District office and the Dade County Department of Environmental Resources Management (DCDERM) shall be notified in writing at least 15 days prior to source testing and at least 5 days prior to initial startup. Written reports of the tests shall be submitted to those offices within 45 days of test completion.

14. The permittee, for good cause, may request that this construction permit be extended. Such a request shall be submitted to the Bureau of Air Regulation prior to 60 days before the expiration of the permit (F.A.C. Rule 17-4.090).

15. An application for an operation permit must be submitted to the Department's Southeast District office and the DCDERM at least 90 days prior to the expiration date of this construction permit or within 45 days after completion of compliance testing, whichever occurs first. To properly apply for an operation permit, the applicant shall submit the appropriate application form, fee, certification that construction was completed noting any deviations from the conditions in the construction permit, and compliance test reports as required by this permit (F.A.C. Rule 17-4.220).

Issued this 25 day
of February, 1991

STATE OF FLORIDA DEPARTMENT
OF ENVIRONMENTAL REGULATION

Carol M. Browner

Carol M. Browner, Secretary

APPENDIX H

PROJECT PARTICIPANTS

PROJECT PARTICIPANTS

Air Consulting and Engineering, Inc.

Stephen L. Neck, P.E.
Field Testing
Report Preparation

Joshua Gelston
Field Testing

J. Colleen Hodge
Field Testing
Post Test Calibrations

Margaret E. Sneeringer
SO2 Analysis

Candace V. Taylor
Document Production

Tarmac Florida, Inc.

Scott Quaas
Test Coordinator

METROPOLITAN DADE COUNTY, FLORIDA

ENVIRONMENTAL RESOURCES MANAGEMENT
ENFORCEMENT SECTION
33 SOUTHWEST 2nd AVENUE
SUITE 1100
MIAMI, FLORIDA 33130-1540
(305) 372-6902

AIR REGULATION
BUREAU OF
FEB 11 1998
RECEIVED

February 3, 1998

Richard D. Pluta, Director
Technical Services
Tarmac America, Inc.
1151 Azalea Garden Road
Norfolk, Virginia 23502

CERTIFIED MAIL NO. Z165003834
RETURNED RECEIPT REQUESTED

Re: Tarmac, Pennsuco Portland Cement Plant located at, near, or in the vicinity of 11000 N.W. 121 Way, Medley, Florida 33178.

Enclosed you will find an original Consent Agreement for the referenced facility which was executed on February 2, 1998. Be advised that the date of execution initiates specific time frames within the Agreement with which you must comply.

If you have any questions concerning the above please contact me at 372-6902.

Sincerely,

Sharon Crabtree

Sharon Crabtree
Code Enforcement Officer

cc: Jim Alves
Mike Unger

SC:ocv

cc: J. Reynolds, BAR
A. Linero, BAR

AGREEMENT

DADE COUNTY DEPARTMENT OF)
ENVIRONMENTAL RESOURCES MANAGEMENT)
Complainant,)
)
VS.)
Tarmac America, Inc.)
Respondent)
)

THIS AGREEMENT, entered into by and between MIAMI-DADE COUNTY DEPARTMENT OF ENVIRONMENTAL RESOURCES MANAGEMENT (hereinafter referred to as DERM), and Tarmac America, Inc. (hereinafter referred to as Tarmac or Respondent) pursuant to Section 24-5(15)(c) Miami-Dade County Environmental Protection Ordinance, shall serve to redress the alleged violations of Section 24-55 of the Code of Miami-Dade County as set forth in a June 17, 1997 Notice of Violation and Orders for Corrective Action, concerning the site located at 11000 NW 121 Way, Medley, DADE County, Florida (Folio #30-2031-001-0030).

The DERM finds the following:

FINDINGS OF FACT

1. The DERM is an agency of Miami-Dade County, a political subdivision of the State of Florida which is empowered to control and prohibit pollution and protect the environment within Dade County pursuant to Article VIII, Section 6 of the Florida Constitution, the Dade County Home Rule Charter and

Section 403.182 of the Florida Statutes.

2. Tarmac is a Delaware corporation that has its principal place of business in Norfolk, Virginia. Tarmac owns and operates a portland cement manufacturing plant located in Dade County, Florida, under the authority of DEP permit no. AC 13-169901. Tarmac is currently doing business in the State of Florida and is a person within the meaning of section 403.031(5), Florida Statutes.

3. Tarmac's cement plant (Pennsuco Plant) in Dade County includes kiln # 2, a wet process, direct-fired cement kiln that originally was constructed in 1969. In wet process cement manufacture, a slurry of filtrate of crushed limerock containing between 20% and 40% moisture content is introduced into an inclined kiln for calcination into quicklime (calcium oxide) clinker by the application of high thermal energies. At Tarmac's kiln # 2, this thermal energy currently is provided primarily by the direct firing of crushed coal. Flow from the coal mill both conveys the crushed coal to the kiln and serves as the primary combustion air for the kiln.

4. On July 8, 1980 the United States Environmental Protection Agency (EPA) issued Final Determination PSD-FL-050 for proposed fuel conversions of the Pennsuco kilns 1,2 and 3 from natural gas to coal. Condition #8 of the Final Determination limited coal-fired NOx emissions from kiln # 2 to 118 lb/hr at the maximum operating rate or 4.73 lb/ton of clinker produced

at lesser operating rates. These limiting emission rates were proposed by Respondent to ensure validity of the exemption from further Prevention of Significant Deterioration (PSD) review (no net increase in emissions). The PSD permit and accompanying regulatory materials specifically contemplated the possibility, based on published emission rate information for large utility boilers and site-specific variables that could not be quantified in advance, that actual NOx emissions while firing coal could be higher than predicted. However, Tarmac produced published test data which reported that "emissions of NOx are less using coal than when using gas or oil as a fuel for cement kilns" due to the "characteristics of the flame". Also, the EPA concurred with Tarmac "that operating conditions can be found which will result in reduced emissions or at least no net increased emissions" when utilizing coal instead of gas.

5. The conversion to coal for kiln # 2 was deferred for several years, and that kiln was never converted under PSD-FL-050. On August 21, 1989 Respondent again submitted an application to the Florida Department of Environmental Regulation (FDER, now known as the Florida Department of Environmental Protection, DEP) to convert kiln # 2 to coal. In this application Respondent requested, based on NOx emission rate data associated with a dissimilar kiln, a maximum allowable NOx emission rate of 169.25 lbs/hr for kiln # 2.

6. On February 27, 1991 DEP issued Construction Permit No. AC 13-169901 (exhibit A attached) to convert kiln # 2 to coal firing. Specific Condition # 5 of said permit limited NOx emissions to 113.8 lbs/hr. Additionally Specific Condition # 12 in DEP permit no. AC 13-169901 required that after the commencement of operation while firing coal, Tarmac shall conduct NOx emissions tests every two months for up to one year. In the event that the required compliance testing resulted in NOx emissions in the range of 113.8 lbs/hr to 169.3 lbs/hr, Specific Condition #12 of said permit provided Tarmac with the opportunity to request DEP to re-evaluate BACT and consider adjustment of the NOx emissions limitations upward from 113.8 lbs/hr to a maximum of 169.3 lbs/hr. The permit stated that DEP would not initiate enforcement proceedings while evaluating an adjustment of the NOx limitation, provided Tarmac made reasonable efforts to limit air emissions.

7. Tarmac did not convert kiln # 2 to coal for an extended period of time after issuance of permit no. AC 13-169901 in 1991 due to reported variabilities in demand for cement and fuel prices. Accordingly, the performance tests were delayed until coal-firing actually commenced. On April 24, 1994 Respondent initiated the bi-monthly compliance testing for a one year period ending April 1995. By letter dated July 21, 1995, Tarmac provided DEP with data from six stack emission tests performed while firing coal in kiln # 2. NOx emissions

exceeded permittable levels at every testing event. Tarmac requested in its July 21, 1995 letter to DEP that the NOx limit be re-evaluated and, based on a statistical analysis of the test results, be adjusted to 445 lbs/hour. DEP's August 24, 1995 response stated that Tarmac's request was "not representative of BACT under PSD rules and that the NOx test results were beyond the range of values for re-evaluation, set by Tarmac."

8. Thereafter, there were several discussions and exchanges of correspondence through which Tarmac, attempted to initiate DEP re-evaluation of the NOx emission limitation. DEP declined to re-evaluate the NOx emission limitation and ultimately expressed its preference that Tarmac evaluate and then implement physical improvements that would result in continuous compliance with the original NOx emission projections (113.8 lbs/hr).

9. On May 28, 1996 Respondent's consulting firm submitted a plan for testing NOx emission levels using a modified coal burner nozzle installed on kiln # 2. Testing was to commence by early June 1996 and test data was to be submitted to DEP by early August 1996.

10. On October 16, 1996 DEP issued a letter to Respondent stating that DEP had not received NOx emissions testing data as stated in the May 28, 1996 letter. DEP requested that Tarmac provide

immediate assessment of the NOx emission using the modified burner nozzle. Resolution of the NOx emission violation was to be achieved by the end of 1996.

11. Resolution of the elevated NOx emissions issue was not achieved and pursuant to the FDEP/DERM air permitting delegation agreement, on April 14, 1997, FDEP referred the continuing NOx emissions violation at the subject site to DERM for follow-up enforcement action.

12. On June 17, 1997 DERM issued a Notice of Violation (NOV) and Orders for Corrective Action and Settlement for exceedances of permitted NOx emission rates. Said NOV ordered Respondent to submit a written plan detailing proposed corrective actions to ensure that the allowable limits for emissions are not exceeded.

13. Tarmac has reported that its analysis indicates that the level of NOx emissions demanded by DEP can be achieved at kiln #2 while firing coal only by developing alternatives that require very substantial expenditures, such as converting kiln # 2 to indirect firing (or other alternative technology), or modernizing its existing wet process system by converting it to employ dry process technology.

14. Tarmac has expressed a willingness to adopt whichever NOx emission reduction option is most cost-effective, taking into

consideration the age of the existing equipment and the degree of reduction in NOx and other criteria pollutant emissions achievable by each alternative. Due to the reported costs involved, the substantial preliminary engineering work required, as well as the need to design for the integration of new systems into existing operations, Tarmac has stated its need for additional time in which to select and implement its best alternative method. If no economically feasible alternative can be developed, Tarmac will cease operating kiln # 2 on coal.

15. Tarmac hereby consents to the terms of this Agreement without either admitting or denying the factual or legal allegations made by DERM in this Agreement or in the Notice of Violation and Orders for Corrective Action and Settlement; and

16. In an effort to insure continued protection of the health and safety of the public and the environment of Dade County and to insure compliance with Chapter 24, Miami-Dade County Environmental Protection Ordinance and to avoid time-consuming and costly litigation, the parties hereto stipulate and agree to the following, and it is ordered:

17. Upon execution of this Consent Agreement Respondent shall, on an interim basis, meet the NOx emission limit monthly average of 220 lbs/hr for kiln # 2 with 240 lbs/hr being the maximum limit on an instantaneous basis. This NOx emission limit shall

remain in effect until the applicable requirements set forth in paragraphs # 21, 22 or 23 of this Agreement are implemented. Respondent shall then meet NOx emission limitations for kiln # 2 as required.

18. In order to verify compliance with paragraph # 17 of this Agreement, Respondent shall install and have operational a continuous emission monitor on kiln #2 by June 1, 1998. Respondent shall obtain DERM concurrence of the system prior to installation. Until the aforementioned continuous emission monitoring system is operational, Respondent shall conduct monthly NOx emission verification testing. Additionally, beginning in July 1, 1998, respondent shall submit to DERM a written Nox emission monitoring report including the monthly Nox emissions chart from kiln #2. This report shall be due by the fifteenth of the month and shall contain the information obtained from the preceding month. The first report is due to DERM by July 15, 1998. Report submittals shall continue until the expiration of this Agreement in accordance with paragraph 38 of this Agreement.

19. On or before January 31, 1998, Respondent shall provide in writing to DERM its method for eliminating exceedances of the NOx emission limitations as stipulated in permit no. AC 13-169901 for kiln # 2. The method provided shall correspond with the applicable requirements set forth below in paragraphs 21, 22 or 23 of this Agreement.

20. If Respondent chooses to implement the requirements set forth in paragraph 22, Respondent shall submit applications by completing forms designated by agency regulations, signed by the appropriate company representative and sealed by a Florida registered professional engineer, with the appropriate fee, for the required air construction permits and/or permit modifications to the FDEP or Dade County DERM, as appropriate. Said application shall be submitted by February 15, 1998. Additional information requested by the appropriate agencies shall be provided by Respondent within fourteen (14) days of the date Respondent receives the request, unless the reviewing agency determines that additional time is necessary due to the scope of its request. If Respondent chooses to implement the requirements set forth in paragraph 23 of this Agreement, these same permitting procedures shall apply, except that the deadline for submitting the applications shall be June 30, 1998. In all cases Respondent shall diligently apply for and seek in a timely manner to obtain any other necessary approvals to perform the work within the same applicable timeframes stipulated above.

21. If Respondent relinquishes its authorization to burn coal in kiln # 2, it shall notify DEP and DERM in writing by January 31, 1998, that it surrenders permit no. AC 13-169901, and within 90 days thereafter shall cease utilizing coal, and operate kiln # 2 only on those fuels currently authorized

under DEP permit no. AO 13-238048 provided that emissions levels for NOx do not exceed the previously established RACT limitation and SO2 emissions do not exceed the current regulations.

22. Alternatively to the requirements set forth in paragraph # 21 of this Agreement, if kiln # 2 is converted to indirect firing or other DERM and DEP accepted technology that meets the NOx limits in permit no. AC 13-166901, construction shall be completed within 12 months after receiving the construction permit modifications referenced in paragraph #20, above, and any other required permits, and then Respondent shall meet the same BACT NOx emission limitations and all other emission limitations as set forth in construction permit NO. AC 13-169901.

23. Alternatively to the requirements set forth in paragraphs # 21 and # 22 of this Agreement, if the plant's manufacturing process is changed to dry process technology, construction shall be completed within 36 months after the required permits have been issued and then Respondent shall meet the permitted emission limitations.

24. Commencing at the next time at which such fees are due under DEP's regulations, Respondent shall pay to FDEP the Title V permitting fee for kiln # 2 NOx emissions based on the monthly interim average of 220 lbs/hr. This fee shall be effective

upon execution of this Consent Agreement and shall remain in effect until Respondent is in compliance with kiln # 2 permitted NOx emissions limitations.

SAFETY PRECAUTIONS

25. The Respondent shall maintain the subject site, during the pendency of this Agreement, in a manner which shall not pose a hazard or threat to the public at large or the environment and shall not cause a nuisance or sanitary nuisance as set forth in Chapter 24, Miami-Dade County Environmental Protection Ordinance.

VIOLATION OF REQUIREMENTS

26. This Agreement constitutes a lawful order of the Director of the Department of Environmental Resources Management and is enforceable in a civil or criminal court of competent jurisdiction pursuant to Chapter 24, Miami-Dade County Environmental Protection Ordinance. Violation of any requirement of the Agreement may result in enforcement action by DERM. Each violation of any of the terms and conditions of this Agreement by the Respondent shall constitute a separate offense.

SETTLEMENT COSTS

27. The Respondent hereby certifies that ~~he~~ it has the financial ability to comply with the terms and conditions stipulated herein and to comply with the payments specified in this Agreement.

28. DERM has determined, that due to DERM's Administrative costs incurred to bring the subject facility into compliance and other sums recoverable pursuant to Section 24-57(e) of the Miami-Dade County Code, an environmental remediation fee of $200,000.00 is appropriate. DERM will allow $50,000 (25%) of the required $200,000.00 environmental remediation fee to be used towards offsetting the costs of continuous emission monitoring equipment installation at kiln #2 (Pennsuco Plant). If for any reason Respondent fails to install the required continuous emission monitoring system Respondent shall pay DERM the full environmental remediation fee of $200,000.00. The Respondent shall within thirty (30) days of the effective date of this Agreement, submit to DERM a certified check in the amount of $150,000.00, for environmental remediation as set forth in Section 24-57(e) for the purpose of the enforcement of environmental laws in Dade County. The check shall be made payable to DERM and sent to the Department of Environmental Resources Management, c/o Sharon Crabtree, Suite 1100, 33 SW 2nd Avenue, Miami, Florida, 33130.

29. Except as otherwise provided under paragraph 33 below, in the event Respondent fails to submit, modify, implement, obtain, provide, operate, comply and or complete those items listed in paragraphs 17,18,19,20,21,22 or 23 (as applicable) herein, the Respondent shall pay DERM a civil penalty of one hundred dollars ($100.00) per day for each day of non-compliance and the Respondent shall be subject to enforcement action in a civil or criminal court of competent jurisdiction for such failure pursuant to the provisions set forth in Chapter 24, Miami-Dade County Environmental Protection Ordinance. Said payment shall be made by Respondent to DERM within ten (10) days of receipt of written notification and shall be sent to the Department of Environmental Resources Management, c/o Sharon Crabtree, at 33 S.W. 2nd Avenue, Miami, Florida 33130.

GENERAL PROVISIONS

30. Respondent shall allow authorized representatives of DERM access to the property at reasonable times for purposes of determining compliance with this Consent Agreement and the rules and regulations set forth in Chapter 24, Miami-Dade County Environmental Protection Ordinance.

31. The DERM expressly reserves the right to initiate appropriate legal action to prevent or prohibit the future violations of applicable statutes or the rules promulgated thereunder.

32. Entry into this Consent Agreement does not relieve Respondent of the responsibility to comply with applicable federal, state or local laws, regulations and ordinances.

33. If any event occurs which causes delay, or the reasonable likelihood of delay, in complying with the requirements or deadlines of this Agreement, Respondent shall have the burden of demonstrating to DERM, that the delay was, or will be, caused by circumstances beyond the control of Respondent. Upon occurrence of the event(s) causing delay, or upon becoming aware of a potential for delay, Respondent shall promptly notify DERM orally within twenty four (24) hours and shall, within five (5) days of oral notification to the DERM, notify DERM in writing of the anticipated length and cause of the delay, the measures taken or to be taken to prevent or minimize the delay, and the timetable by which Respondent intends to implement these measures. If DERM determines that the delay has been or will be caused by circumstances beyond the reasonable control of Respondent, the time for performance hereunder shall be extended for as reasonable a period as may be determined based on such circumstances. Excessive Emissions pursuant to Florida Administrative Code (F.A.C.) 62-210.700 may be considered a reasonable delay in emissions compliance with this Agreement provided Respondent complies with the requirements of this paragraph. The Respondent shall adopt all reasonable measures necessary to avoid or minimize delay.

Failure of Respondent to comply with the notice requirements of this paragraph in a timely manner shall constitute a waiver of Respondent's right to request an extension of time for compliance with the requirements or deadlines of this Agreement.

34. This Agreement shall neither be evidence of a violation of this Chapter or other environmental laws nor shall it be deemed to impose any limitation upon any investigation or action by DERM in the enforcement of Chapter 24, Miami-Dade County Environmental Protection Ordinance.

35. In consideration of the complete and timely performance by the Respondent of the obligations contained in the Agreement, DERM waives its rights to seek judicial imposition of damages or criminal or civil penalties for the matters alleged in this Agreement and the June 17, 1997 Notice of Violations and Orders for Correction Action.

36. This Agreement shall become effective upon the date of execution by the Director, Environmental Resources Management.

37. This Agreement shall expire upon written concurrence by The DERM, at such time as Respondent ceases to utilize coal in kiln #2 and has shown to be in compliance with paragraph 21 of this agreement or files with DEP and DERM a certificate of compliance documenting that it has commenced commercial

operation and has shown to be in compliance with the prescribed requirements of paragraphs 22 or 23.

STATE OF VIRGINIA
CITY OF NORFOLK

1-30-98
Date

John D. Carr, President
Tarmac America, Inc.

BEFORE ME, the undersigned authority, personally appeared JOHN D. CARR who after being duly sworn, deposes and says that he has read and agrees to the foregoing.

Sworn to and subscribed before me this 30th day of January, 1998 by JOHN D. CARR.
(name of affiant)

Personally Known ✓ or Produced Identification ______.
(Check one)

Type of Identification Produced: ______________________.

My Commission Expires August 31, 1999

Notary Public

2-2-98
Date

John W. Renfrow, P.E., Director
Environmental Resources Management

Witness

Witness

DERM
Complainant
VS.
Tarmac America, Inc.
Respondent

EXHIBIT A

Florida Department of Environmental Regulation

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

Lawton Chiles, Governor | Carol M. Browner, Secretary

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

Permit Number: AC 13-169901
PSD-FL-142
Expiration Date: June 30, 1992
County: Dade
Latitude/Longitude: 25°52'30"N
80°22'30"W
Project: Kiln No. 2 Coal Conversion

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For the conversion of kiln No. 2 to coal firing. The project will be located at the permittee's existing facility in Medley, Dade County, Florida. The UTM coordinates are Zone 17, 562.8 km East and 2861.7 km North.

The source shall be constructed in accordance with the permit application, plans, documents, amendments and drawings, except as otherwise noted in the General and Specific Conditions.

Attachments are listed below:

1. Application to construct received September 5, 1989.
2. DER's letter of incompleteness dated October 4, 1989.
3. EPA's letter dated October 18, 1989.
4. KBN's response (to incompleteness letter) dated November 13, 1989.
5. Dade County DERM's letter dated November 17, 1989.
6. EPA's letter dated December 13, 1989.
7. KBN's letter dated December 21, 1989.
8. KBN's letter dated January 15, 1990.
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10. EPA's letter dated March 20, 1990.
11. EPA's letter dated April 13, 1990.
12. Dade County DERM's letter dated April 30, 1990.
13. NPS's letter dated May 30, 1990.

PERMITTEE:
Tarmac Florida, Inc.

Permit Number: AC 13-169901
PSD-FL-142
Expiration Date: June 30, 1992

GENERAL CONDITIONS:

6. The permittee shall properly operate and maintain the facility and systems of treatment and control (and related appurtenances) that are installed or used by the permittee to achieve compliance with the conditions of this permit, as required by Department rules. This provision includes the operation of backup or auxiliary facilities or similar systems when necessary to achieve compliance with the conditions of the permit and when required by Department rules.

7. The permittee, by accepting this permit, specifically agrees to allow authorized Department personnel, upon presentation of credentials or other documents as may be required by law and at a reasonable time, access to the premises, where the permitted activity is located or conducted to:

a. Have access to and copy any records that must be kept under the conditions of the permit;

b. Inspect the facility, equipment, practices, or operations regulated or required under this permit; and

c. Sample or monitor any substances or parameters at any location reasonably necessary to assure compliance with this permit or Department rules.

Reasonable time may depend on the nature of the concern being investigated.

8. If, for any reason, the permittee does not comply with or will be unable to comply with any condition or limitation specified in this permit, the permittee shall immediately provide the Department with the following information:

a. a description of and cause of non-compliance; and

b. the period of noncompliance, including dates and times; or, if not corrected, the anticipated time the non-compliance is expected to continue, and steps being taken to reduce, eliminate, and prevent recurrence of the non-compliance.

GENERAL CONDITIONS:

b. The permittee shall hold at the facility or other location designated by this permit records of all monitoring information (including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation) required by the permit, copies of all reports required by this permit, and records of all data used to complete the application for this permit. These materials shall be retained at least three years from the date of the sample, measurement, report, or application unless otherwise specified by Department rule.

c. Records of monitoring information shall include:

- the date, exact place, and time of sampling or measurements;
- the person responsible for performing the sampling or measurements;
- the dates analyses were performed;
- the person responsible for performing the analyses;
- the analytical techniques or methods used; and
- the results of such analyses.

15. When requested by the Department, the permittee shall within a reasonable time furnish any information required by law which is needed to determine compliance with the permit. If the permittee becomes aware that relevant facts were not submitted or were incorrect in the permit application or in any report to the Department, such facts or information shall be corrected promptly.

SPECIFIC CONDITIONS:

1. The construction and operation of the subject modification of kiln No. 2 shall be in accordance with the capacities and specifications stated in the application.

2. The maximum clinker production rate of kiln No. 2 shall not exceed 25 tons per hour and 197,100 tons per year. Kiln No. 2 shall operate only on coal firing for up to 7,884 hours per year at a maximum firing rate of 162.5 MMBtu per hour. The coal used for firing kiln No. 2 shall have a maximum sulfur content of 2.0 percent by weight, with the rolling 30-day average sulfur content not exceeding 1.75 percent by weight.

3. Sulfur dioxide emissions from kiln No. 2 shall not exceed 7.8 lbs/ton of clinker produced, 195.0 lbs/hr, 768.7 tons/yr.

SPECIFIC CONDITIONS:

of 5.86 to 8.25 lbs/hr (up to 0.33 lbs/ton clinker, 32.52 TPY), the Department, if requested by the permittee, shall re-evaluate BACT and consider upward adjustments of the emission limitations for the indicated constituents based on available data. During this testing and evaluation period, the permittee shall make reasonable efforts to limit air emissions, and the Department shall not initiate enforcement proceedings. Any upward adjustment of emission limitations pursuant to this paragraph shall be the subject of public notice in a local newspaper pursuant to Department rules. The Department's determination based on the data produced under this paragraph shall be a point of entry for purposes of Section 120.57, Florida Statutes.

13. The compliance tests shall be conducted within 30 days after operation on coal begins. The Department's Southeast District office and the Dade County Department of Environmental Resources Management (DCDERM) shall be notified in writing at least 15 days prior to source testing and at least 5 days prior to initial startup. Written reports of the tests shall be submitted to those offices within 45 days of test completion.

14. The permittee, for good cause, may request that this construction permit be extended. Such a request shall be submitted to the Bureau of Air Regulation prior to 60 days before the expiration of the permit (F.A.C. Rule 17-4.090).

15. An application for an operation permit must be submitted to the Department's Southeast District office and the DCDERM at least 90 days prior to the expiration date of this construction permit or within 45 days after completion of compliance testing, whichever occurs first. To properly apply for an operation permit, the applicant shall submit the appropriate application form, fee, certification that construction was completed noting any deviations from the conditions in the construction permit, and compliance test reports as required by this permit (F.A.C. Rule 17-4.220).

Issued this 25 day
of February, 1991

STATE OF FLORIDA DEPARTMENT
OF ENVIRONMENTAL REGULATION

Carol M. Browner

Carol M. Browner, Secretary