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June 30, 1995

Mr. A. A. Linero, P.E.
Administrator
New Source Review Section
FDEP-DARM-BAR

RECEIVED
JUL 3 1995
Bureau of Air Regulation

SUBJECT: K&A 187-94-02
Florida Rock Industries, Inc.
Newberry Cement Plant
Permits Nos. AC01-267311 and PSD-FL-228
Response to Request for Additional Information, dated 16-JUN-1995

Dear Mr. Linero:

Enclosed please find the requested information for the referenced project. The format of this response is as follows:

1. All questions have been reproduced, preserving original numbering.
2. Responses follow each question.

If further information is required, please do not hesitate to call me or Steve Cullen (Project Engineer) at (904) 377-5822.

Sincerely,

John B. Koogler, Ph.D., P.E.
Koogler & Associates

JUL 10 1995

copy to: Fred Cohrs, FRI

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION
Florida Rock Industries, Inc. - Newberry Cement Plant
Permits Nos. AC01-267311 and PSD-FL-228

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TOXIC ANALYSIS

1. The response to question No. 2 of the emission data section, concerning hazardous air pollutant (HAP) emissions, noted that Table 11.6-9 of AP-42 was the source for the HAP emission rates supplied in the response. Although information about the HAP emission rates and resulting ambient concentrations were supplied for beryllium, lead, HCl and benzene, other HAPS identified within AP-42 with available emission factors for cement kilns were not listed in the response. Please provide the emission rates and ambient maximum 8-hour, 24-hour and annual concentrations for all HAPs that will be emitted by this facility as calculated from AP-42. In addition, if any HAP measurements have been made at your facility or other cement kilns operating under conditions similar to the proposed facility from which you can readily obtain this data, please submit that information as well.

RESPONSE:

Emission rates:

Emission rates were provided, in the original application, for only those regulated pollutants that exceeded applicable reporting thresholds. The following pollutants would be emitted in excess of 1.0 tpy:

Aluminum (4.6 TPY): Not a regulated air pollutant
Calcium (86 TPY): Not a regulated air pollutant
Chloride (240 TPY): Not a regulated air pollutant
Copper (1.9 TPY): Not a regulated air pollutant
Iron (6.1 TPY): Not a regulated air pollutant
Hydrogen Chloride (17 TPY): HCL, H106, information provided with application
Potassium (6.4 TPY): Not a regulated air pollutant
Ammonia (3.6 TPY): Regulated under 112(r), reporting threshold = 100 TPY
Ammonium (39 TPY): Not a regulated air pollutant
Nitrate (1.6 TPY): Not a regulated air pollutant
Sodium (14 TPY): Not a regulated air pollutant
Sulfur Trioxide (31 TPY): Regulated under 112(r), reporting threshold = 100 TPY
Sulfate (71 TPY): Not a regulated air pollutant
Benzene (1.1 TPY): H017, information provided with application
Benzoic Acid (1.2 TPY): Not a regulated air pollutant

Lead and beryllium (both < 1.0 tpy) were described in the application because of lower applicable reporting thresholds. Other pollutants listed in AP-42, Table 11.6-9 were not reported because calculated emissions were less than the applicable reporting threshold of 1.0 TPY.

Emission rates in pounds per hour (lb/hr), tons per year (TPY), and grams per second (g/s), for all pollutants listed in AP-42, Table 11.6-9, are presented in Appendix A.

Ambient concentrations:

Ambient maximum 8-hour, 24-hour, and annual concentrations were calculated for all pollutants listed in AP-42, Table 11.6-9, and are presented in Appendix A. A "generic" SCREEN model was run (Appendix A) using appropriate stack parameters and an emission rate of 1.0 grams per second (g/s). The pollutant-specific ambient concentrations were then calculated by multiplying the "generic" concentrations by the pollutant-specific emission rates in grams per second.

The modeled 8-hour, 24-hour, and annual concentrations for each pollutant were compared to the No Threat Levels (NTL) from the FDEP Working List Version 3.0; and the modeled annual concentrations were compared to the Reference Air Concentrations (RAC) and Risk-specific Dosages (RsD) from the Federal Boiler and Industrial Furnace (BIF) rule.

The FDEP "air toxics strategy" has not been documented by the Department in written form. Our understanding of this air toxics strategy derives from discussions with Mr. John Glunn (FDEP, Tallahassee) and statements made by Department staff, Department legal counsel and a DOAH hearing officer at a recent administrative hearing.

FDEP does not have any rule requirements in place to regulate the ambient air concentrations of air toxics from stationary air pollution sources. However, recognizing the need for addressing air toxics releases and their impacts on human health, FDEP has identified certain reference air concentrations for air permitting purposes. These Florida Air Reference Concentrations (FARC), also known as No Threat Levels (NTL), are derived from occupational safety standards or from health effects studies conducted by EPA. While this conservative approach results in restrictive "acceptable" ambient air concentrations for air toxics, FDEP feels that the FARC provide a useful screening tool in assessing potential impacts of existing and/or proposed facilities.

Currently, the air toxics strategy includes a list of 751 compounds (including some duplications) which could be considered air toxics. This compares with a list of 189 compounds that are listed as air toxics under Title III of the 1990 Clean Air Act Amendments. The list of 189 compounds has been adopted by the Department under Rule 62-213, FAC, however no ambient air quality standards have been set.

It is also our understanding, based on conversations with Department personnel and upon statements made by Department personnel, that future Florida air toxics strategies will concentrate on the compounds covered by Rule 62-213, FAC, and furthermore will concentrate on the annual impacts of these compounds when emitted from stationary facilities. The short-term impacts (8-hour and 24-hour) have been developed by the Department primarily to assess the potential impacts of mobile and temporary facilities.

Regarding the regulatory status of the air toxics strategy, it was stated at a recent Department of Administration hearing by Department staff and legal counsel that the strategy was a "permitting tool" only. Because of this status, neither the NTL/FARC cited in the strategy nor emission limits based on the strategy could become permit limits unless agreed upon both by the Department and the applicant. Furthermore, as the toxics are not addressed under the current State Implementation Plan (SIP), emission limits would not be federally enforceable even if they are contained in an air construction permit.

This cement plant will be a permanent and stationary source, therefore it would be appropriate to compare only the modeled annual concentrations with the concentrations in the BIF rule. However, short-term concentrations and comparisons to the NTL are presented for informational purposes.

All concentrations for all pollutants for all averaging periods were determined to be less than the FDEP No Threat Levels and the BIF Reference Air Concentrations and Risk-Specific Dosages.

HAP measurements:
No HAP measurements have been made at this cement plant as the plant is not yet constructed. Some HAP measurements have been made by Koogler & Associates at other cement plants. These emission rates are presented in Appendix B. These measurements were obtained at various cement plants in Florida and the reported data are in FDEP files.

The emissions measurements presented in Appendix B should not be interpreted as representative of the proposed cement plant as materials, fuels, physical plant configurations, and operating scenarios vary widely in this industry.

BACT ANALYSIS

2. Please explore more the option of Low NOx Burner as BACT for this project. It appears the cost figure of $1050 per ton removed is within the limits of recent BACT determinations done by the Department.

RESPONSE: Low NOx burners result in lower flame temperatures and less thermal NOx formation. The staged combustion (from the indirect firing system), secondary combustion of fuel (in the precalciner), and process controls associated with the proposed plant all serve to reduce the generation of thermal NOx.

The production of quality clinker requires minimum flame and kiln temperatures. The configuration of the proposed plant will ensure that flame and kiln temperatures are as low as possible without sacrificing clinker quality. The use of a low NOx burner would further reduce flame (and kiln) temperatures, and clinker quality would decrease.

The use of low NOx burners may be an effective method of NOx reduction for kilns that operate with a large "spread" between the minimum clinkering temperature and the flame/kiln temperatures. These types of kilns include wet-process kilns and long, dry process kilns without preheaters or precalciners.

Low NOx burners and their application to new preheater/precalciner kilns utilizing indirect-firing were discussed during a telephone call with Eric Hansen, Vice President and Technical Director of Ash Grove Cement. Mr. Hansen confirmed that Ash Grove's Seattle cement plant had been equipped with a low NOx burner, and clinker quality was significantly degraded until traditional burner modifications were completed. It is Mr. Hansen's opinion that a well-controlled preheater/precalciner kiln utilizing indirect-firing will produce the least NOx while preserving necessary clinker quality; and that such a design represents not only BACT but MACT.

The reported European use of low NOx burners for cement kilns was also discussed with Mr. Hansen, who stated that European clinker and cement specifications are different than corresponding U.S. specifications. As the clinker chemistry is different, required minimum clinkering temperatures are different. Therefore, it would be inappropriate to assume that low NOx burners would be effective in U.S. cement kilns.

AIR QUALITY

3. Please address the Air Quality Related Values (AQRV) Analysis and regional haze comments in the attached National Park Service correspondence.

RESPONSE: Ellen Porter of the Air Quality Branch of the Fish and Wildlife Service stated during a telephone call on June 26, 1995 that the Air Quality Related Values (AQRV) Analysis previously submitted to the Department is acceptable to the National Park Service. She further stated that no additional AQRV analysis is required or expected for this project.

Ms. Porter provided, by facsimile, a recent regional haze analysis to be used as guidance for the requested regional haze analysis. This guidance, and the methodology contained in the EPA document, *Interagency Workgroup on Air Quality Modeling*, was used in to prepare the regional haze analysis for the Florida Rock cement plant.

The regional haze analysis contained in Appendix C shows visibility impacts of 0.08 deciview at Chassahowitzka NWR and 0.09 deciview at Okefenokee NWR. Information from the National Park Service has indicated that changes of less than 1.0 deciview are generally imperceptible. It is reasonable to assume, based on the regional haze analysis and the earlier VISCREEN analysis, that there will be negligible visibility impacts at either Federal Class I Area as a result of this project.

APPENDIX A

HAP EMISSION RATES
HAP AMBIENT CONCENTRATIONS
SCREEN MODEL RUN

HAP ANALYSIS

POLLUTANT NAME	SYMBOL CAS #	CONTROL	EMISSION FACTOR LB/TON CLINKER	EMISSION RATE LB/HR	TPY	G/S
INORGANIC POLLUTANTS:						
Silver	Ag	FF	6.1E-07	5.8E-05	2.2E-04	7.4E-06
Aluminum	Al	ESP	1.3E-02	1.2E+00	4.6E+00	1.6E-01
Arsenic	As	ESP	1.3E-05	1.2E-03	4.6E-03	1.6E-04
Barium	Ba	ESP	3.5E-04	3.4E-02	1.2E-01	4.2E-03
Beryllium	Be	FF	6.6E-07	6.3E-05	2.4E-04	8.0E-06
Calcium	Ca	ESP	2.4E-01	2.3E+01	8.6E+01	2.9E+00
Cadmium	Cd	ESP	8.3E-06	8.0E-04	3.0E-03	1.0E-04
Chloride	Cl	ESP	6.8E-01	6.5E+01	2.4E+02	8.2E+00
Chromium	Cr	ESP	7.7E-06	7.4E-04	2.7E-03	9.3E-05
Copper	Cu	FF	5.3E-03	5.1E-01	1.9E+00	6.4E-02
Fluoride	F	ESP	9.0E-04	8.6E-02	3.2E-01	1.1E-02
Iron	Fe	ESP	1.7E-02	1.6E+00	6.1E+00	2.1E-01
Hydrogen Chloride	HCl	ESP	4.9E-02	4.7E+00	1.7E+01	5.9E-01
Mercury	Hg	ESP	2.2E-04	2.1E-02	7.8E-02	2.7E-03
Potassium	K	ESP	1.8E-02	1.7E+00	6.4E+00	2.2E-01
Manganese	Mn	ESP	8.6E-04	8.2E-02	3.1E-01	1.0E-02
Ammonia	NH_3	FF	1.0E-02	9.6E-01	3.6E+00	1.2E-01
Ammonium	NH_4	ESP	1.1E-01	1.1E+01	3.9E+01	1.3E+00
Nitrate	NO_3	ESP	4.6E-03	4.4E-01	1.6E+00	5.6E-02
Sodium	Na	ESP	3.8E-02	3.6E+00	1.4E+01	4.6E-01
Lead	Pb	ESP	7.1E-04	6.8E-02	2.5E-01	8.6E-03
Sulfur Trioxide	SO_3	ESP	8.6E-02	8.2E+00	3.1E+01	1.0E+00
Sulfate	SO_4	ESP	2.0E-01	1.9E+01	7.1E+01	2.4E+00
Selenium	Se	ESP	1.5E-04	1.4E-02	5.3E-02	1.8E-03
Thallium	Th	FF	5.4E-06	5.2E-04	1.9E-03	6.5E-05
Titanium	Ti	ESP	3.7E-04	3.5E-02	1.3E-01	4.5E-03
Zinc	Zn	ESP	5.4E-04	5.2E-02	1.9E-01	6.5E-03

HAP ANALYSIS

POLLUTANT NAME	SYMBOL CAS #	CONTROL	EMISSION FACTOR LB/TON CLINKER	EMISSION RATE LB/HR	TPY	G/S
ORGANIC POLLUTANTS:						
C3 Benzenes		ESP	2.6E-06	2.5E-04	9.3E-04	3.1E-05
C4 Benzenes		ESP	6.0E-06	5.7E-04	2.1E-03	7.2E-05
C6 Benzenes		ESP	9.2E-07	8.8E-05	3.3E-04	1.1E-05
Acenapthylene	208-96-8	FF	1.2E-04	1.1E-02	4.3E-02	1.4E-03
Acetone	67-64-1	ESP	3.7E-04	3.5E-02	1.3E-01	4.5E-03
Benzaldehyde	100-52-7	ESP	2.4E-05	2.3E-03	8.6E-03	2.9E-04
Benzene	71-43-2	ESP	3.1E-03	3.0E-01	1.1E+00	3.7E-02
Benzo(a)anthracene		FF	4.3E-08	4.1E-06	1.5E-05	5.2E-07
Benzo(a)pyrene	50-32-8	FF	1.3E-07	1.2E-05	4.6E-05	1.6E-06
Benzo(b)fluoranthene	205-99-2	FF	5.6E-07	5.4E-05	2.0E-04	6.8E-06
Benzo(g,h,i)perylene	191-24-2	FF	7.8E-08	7.5E-06	2.8E-05	9.4E-07
Benzo(k)fluoranthene	207-08-9	FF	1.5E-07	1.4E-05	5.3E-05	1.8E-06
Benzoic Acid	65-85-0	ESP	3.5E-03	3.4E-01	1.2E+00	4.2E-02
Biphenyl	95-52-4	ESP	6.1E-06	5.8E-04	2.2E-03	7.4E-05
Bis(2-ethylhexyl)phthalate	117-81-7	ESP	9.5E-05	9.1E-03	3.4E-02	1.1E-03
Bromomethane	74-83-9	ESP	4.3E-05	4.1E-03	1.5E-02	5.2E-04
Carbon Disulfide	75-15-0	ESP	1.1E-04	1.1E-02	3.9E-02	1.3E-03
Chlorobenzene	108-90-7	ESP	1.6E-05	1.5E-03	5.7E-03	1.9E-04
Chloromethane	74-87-3	ESP	3.8E-04	3.6E-02	1.4E-01	4.6E-03
Chrysene	218-01-9	FF	1.6E-07	1.5E-05	5.7E-05	1.9E-06
Di-n-butylphthalate	84-74-2	ESP	4.1E-05	3.9E-03	1.5E-02	5.0E-04
Dibenz(a,h)anthracene	53-70-3	FF	6.3E-07	6.0E-05	2.2E-04	7.6E-06
Ethylbenzene	101-41-4	ESP	1.9E-05	1.8E-03	6.8E-03	2.3E-04
Fluoranthene	206-44-0	FF	8.8E-06	8.4E-04	3.1E-03	1.1E-04
Fluorene	86-73-7	FF	1.9E-05	1.8E-03	6.8E-03	2.3E-04
Formaldehyde	50-00-0	FF	4.6E-04	4.4E-02	1.6E-01	5.6E-03
Freon 113		ESP	5.0E-05	4.8E-03	1.8E-02	6.0E-04
Indeno(1,2,3-cd)pyrene	193-39-5	FF	8.7E-08	8.3E-06	3.1E-05	1.1E-06
Methyl Ethyl Ketone	78-93-3	ESP	3.0E-05	2.9E-03	1.1E-02	3.6E-04
Methylene Chloride	75-09-2	ESP	4.9E-04	4.7E-02	1.7E-01	5.9E-03
Methynaphthalene		ESP	4.2E-06	4.0E-04	1.5E-03	5.1E-05
Naphthalene	91-20-3	ESP	2.2E-04	2.1E-02	7.8E-02	2.7E-03
Phenanthrene	85-01-8	FF	3.9E-04	3.7E-02	1.4E-01	4.7E-03
Phenol	108-95-2	ESP	1.1E-04	1.1E-02	3.9E-02	1.3E-03
Pyrene	129-00-0	FF	4.4E-06	4.2E-04	1.6E-03	5.3E-05
Styrene	100-42-5	ESP	1.5E-06	1.4E-04	5.3E-04	1.8E-05
Toluene	108-88-3	ESP	1.9E-04	1.8E-02	6.8E-02	2.3E-03
Total HpCDD		FF	3.9E-10	3.7E-08	1.4E-07	4.7E-09
Total OCDD	3268-87-9	FF	2.0E-09	1.9E-07	7.1E-07	2.4E-08
Total PCDD		FF	2.7E-09	2.6E-07	9.6E-07	3.3E-08
Total PCDF	132-64-9	FF	2.9E-10	2.8E-08	1.0E-07	3.5E-09
Total TCDF	132-64-9	FF	2.9E-10	2.8E-08	1.0E-07	3.5E-09
Total dioxins/furans*			1.5E-09	1.5E-07	5.4E-07	1.8E-08
Xylenes	1330-20-7	ESP	1.3E-04	1.2E-02	4.6E-02	1.6E-03

HAP ANALYSIS

POLLUTANT NAME	SYMBOL	AMBIENT CONCENTRATIONS			FDEP NTL			BIF
	CAS #	8-HOUR	24-HOUR	ANNUAL	8-HOUR	24-HOUR	ANNUAL	ANNUAL
INORGANIC POLLUTANTS:								
Silver	Ag	1.6E-05	9.3E-06	1.9E-06	1.0E-01	2.4E-02	3.0E+00	3.0E+00
Aluminum	Al	3.5E-01	2.0E-01	4.0E-02	1.0E+02	2.4E+01	3.0E-01	N/A
Arsenic	As	3.5E-04	2.0E-04	4.0E-05	2.0E+00	4.8E-01	2.3E-04	2.3E-03
Barium	Ba	9.3E-03	5.3E-03	1.1E-03	5.0E+00	1.2E+00	5.0E+01	5.0E+01
Beryllium	Be	1.8E-05	1.0E-05	2.0E-06	2.0E-02	4.8E-03	4.2E-04	4.2E-03
Calcium	Ca	6.4E+00	3.7E+00	7.3E-01	N/A	N/A	N/A	N/A
Cadmium	Cd	2.2E-04	1.3E-04	2.5E-05	5.0E-01	1.2E-01	5.6E-04	5.6E-03
Chloride	Cl	1.8E+01	1.0E+01	2.1E+00	N/A	N/A	N/A	N/A
Chromium	Cr	2.1E-04	1.2E-04	2.4E-05	5.0E-01	1.2E-01	N/A	8.3E-04
Copper	Cu	1.4E-01	8.1E-02	1.6E-02	1.0E+01	2.4E+00	N/A	N/A
Fluoride	F	2.4E-02	1.4E-02	2.7E-03	2.5E+01	6.0E+00	N/A	5.0E+01
Iron	Fe	4.5E-01	2.6E-01	5.2E-02	1.0E+01	2.4E+00	N/A	N/A
Hydrogen Chloride	HCl	1.3E+00	7.5E-01	1.5E-01	7.5E+01	1.8E+01	7.0E+00	7.0E+00
Mercury	Hg	5.9E-03	3.4E-03	6.7E-04	1.0E+00	2.4E-01	N/A	8.0E-02
Potassium	K	4.8E-01	2.7E-01	5.5E-02	N/A	N/A	N/A	N/A
Manganese	Mn	2.3E-02	1.3E-02	2.6E-03	5.0E+01	1.2E+01	4.0E-01	N/A
Ammonia	NH_3	2.7E-01	1.5E-01	3.1E-02	1.7E+02	4.1E+01	1.0E+02	N/A
Ammonium	NH_4	2.9E+00	1.7E+00	3.4E-01	N/A	N/A	N/A	N/A
Nitrate	NO_3	1.2E-01	7.0E-02	1.4E-02	N/A	N/A	N/A	N/A
Sodium	Na	1.0E+00	5.8E-01	1.2E-01	N/A	N/A	N/A	N/A
Lead	Pb	1.9E-02	1.1E-02	2.2E-03	5.0E-01	1.2E-01	9.0E-02	9.0E-02
Sulfur Trioxide	SO_3	2.3E+00	1.3E+00	2.6E-01	N/A	N/A	N/A	N/A
Sulfate	SO_4	5.3E+00	3.1E+00	6.1E-01	N/A	N/A	N/A	N/A
Selenium	Se	4.0E-03	2.3E-03	4.6E-04	2.0E+00	4.8E-01	N/A	4.0E+00
Thallium	Th	1.4E-04	8.2E-05	1.6E-05	1.0E+00	2.4E-01	5.0E-01	5.0E-01
Titanium	Ti	9.9E-03	5.6E-03	1.1E-03	N/A	N/A	N/A	N/A
Zinc	Zn	1.4E-02	8.2E-03	1.6E-03	N/A	N/A	N/A	N/A

HAP ANALYSIS

POLLUTANT NAME	SYMBOL	AMBIENT CONCENTRATIONS			FDEP NTL			BIF
	CAS #	8-HOUR	24-HOUR	ANNUAL	8-HOUR	24-HOUR	ANNUAL	ANNUAL
ORGANIC POLLUTANTS:								
C3 Benzenes		6.9E-05	4.0E-05	7.9E-06	N/A	N/A	N/A	N/A
C4 Benzenes		1.6E-04	9.2E-05	1.8E-05	N/A	N/A	N/A	N/A
C6 Benzenes		2.5E-05	1.4E-05	2.8E-06	N/A	N/A	N/A	N/A
Acenapthylene	208-96-8	3.2E-03	1.8E-03	3.7E-04	N/A	N/A	N/A	N/A
Acetone	67-64-1	9.9E-03	5.6E-03	1.1E-03	3.6E+04	8.5E+03	N/A	N/A
Benzaldehyde	100-52-7	6.4E-04	3.7E-04	7.3E-05	N/A	N/A	N/A	N/A
Benzene	71-43-2	8.3E-02	4.7E-02	9.5E-03	3.0E+01	7.2E+00	1.2E-01	1.2E+00
Benzo(a)anthracene		1.1E-06	6.6E-07	1.3E-07	N/A	N/A	N/A	1.1E-02
Benzo(a)pyrene	50-32-8	3.5E-06	2.0E-06	4.0E-07	N/A	N/A	N/A	3.0E-03
Benzo(b)fluoranthene	205-99-2	1.5E-05	8.5E-06	1.7E-06	N/A	N/A	N/A	N/A
Benzo(g,h,i)perylene	191-24-2	2.1E-06	1.2E-06	2.4E-07	N/A	N/A	N/A	N/A
Benzo(k)fluoranthene	207-08-9	4.0E-06	2.3E-06	4.6E-07	N/A	N/A	N/A	N/A
Benzoic Acid	65-85-0	9.3E-02	5.3E-02	1.1E-02	N/A	N/A	N/A	N/A
Biphenyl	95-52-4	1.6E-04	9.3E-05	1.9E-05	1.3E+01	3.1E+00	N/A	N/A
Bis(2-ethylhexyl)phthalate	117-81-7	2.5E-03	1.4E-03	2.9E-04	N/A	N/A	N/A	4.2E+01
Bromomethane	74-83-9	1.1E-03	6.6E-04	1.3E-04	1.9E+02	4.6E+01	8.0E-01	2.0E+00
Carbon Disulfide	75-15-0	2.9E-03	1.7E-03	3.4E-04	3.1E+02	7.4E+01	2.0E+02	3.0E+00
Chlorobenzene	108-90-7	4.3E-04	2.4E-04	4.9E-05	3.5E+03	8.3E+02	N/A	N/A
Chloromethane	74-87-3	1.0E-02	5.8E-03	1.2E-03	N/A	N/A	N/A	2.8E+00
Chrysene	218-01-9	4.3E-06	2.4E-06	4.9E-07	N/A	N/A	N/A	N/A
Di-n-butylphthalate	84-74-2	1.1E-03	6.3E-04	1.3E-04	5.0E+01	1.2E+01	1.0E+02	N/A
Dibenz(a,h)anthracene	53-70-3	1.7E-05	9.6E-06	1.9E-06	N/A	N/A	N/A	7.1E-04
Ethylbenzene	101-41-4	5.1E-04	2.9E-04	5.8E-05	4.3E+03	1.0E+03	1.0E+03	N/A
Fluoranthene	206-44-0	2.4E-04	1.3E-04	2.7E-05	N/A	N/A	N/A	N/A
Fluorene	86-73-7	5.1E-04	2.9E-04	5.8E-05	N/A	N/A	N/A	N/A
Formaldehyde	50-00-0	1.2E-02	7.0E-03	1.4E-03	1.2E+01	2.9E+00	7.7E-02	7.7E-01
Freon 113		1.3E-03	7.6E-04	1.5E-04	N/A	N/A	N/A	N/A
Indeno(1,2,3-cd)pyrene	193-39-5	2.3E-06	1.3E-06	2.7E-07	N/A	N/A	N/A	N/A
Methyl Ethyl Ketone	78-93-3	8.0E-04	4.6E-04	9.2E-05	5.9E+03	1.4E+03	8.0E+01	8.0E+01
Methylene Chloride	75-09-2	1.3E-02	7.5E-03	1.5E-03	1.7E+03	4.2E+02	2.1E+00	2.4E+00
Methynaphthalene		1.1E-04	6.4E-05	1.3E-05	N/A	N/A	N/A	N/A
Naphthalene	91-20-3	5.9E-03	3.4E-03	6.7E-04	5.2E+02	1.2E+02	N/A	N/A
Phenanthrene	85-01-8	1.0E-02	6.0E-03	1.2E-03	N/A	N/A	N/A	N/A
Phenol	108-95-2	2.9E-03	1.7E-03	3.4E-04	1.9E+02	4.6E+01	3.0E+01	3.0E+01
Pyrene	129-00-0	1.2E-04	6.7E-05	1.3E-05	N/A	N/A	N/A	N/A
Styrene	100-42-5	4.0E-05	2.3E-05	4.6E-06	2.1E+03	5.1E+02	N/A	N/A
Toluene	108-88-3	5.1E-03	2.9E-03	5.8E-04	3.8E+03	9.0E+02	3.0E+02	5.0E+02
Total HpCDD		1.0E-08	6.0E-09	1.2E-09	N/A	N/A	N/A	N/A
Total OCDD	3268-87-9	5.3E-08	3.1E-08	6.1E-09	N/A	N/A	N/A	N/A
Total PCDD		7.2E-08	4.1E-08	8.2E-09	N/A	N/A	N/A	N/A
Total PCDF	132-64-9	7.7E-09	4.4E-09	8.9E-10	N/A	N/A	N/A	N/A
Total TCDF	132-64-9	7.7E-09	4.4E-09	8.9E-10	N/A	N/A	N/A	N/A
Total dioxins/furans*		4.1E-08	2.3E-08	4.7E-09	N/A	N/A	2.2E-08	2.2E-07
Xylenes	1330-20-7	3.5E-03	2.0E-03	4.0E-04	4.3E+03	1.0E+03	8.0E+01	8.0E+01

HAP ANALYSIS

NOTES:		
ESP = ELECTROSTATIC PRECIPITATOR		
FF = FABRIC FILTER		
HpCDD = HEPTA CHLORO DI-BENZO DIOXIN		
OCDD = OCTA CHLORO DI-BENZO DIOXIN		
PCDD = PENTA CHLORO DI-BENZO DIOXIN		
PCDF = PENTA CHLORO DI-BENZO FURAN		
TCDF = TETRA CHLORO DI-BENZO FURAN		
*DIOXIN & FURAN EMISSIONS ARE WEIGHTED AND COMPARED WITH 2,3,7,8 TETRA CHLORO DI-BENZO DIOXIN		
EMISSION FACTORS FROM AP-42, FIFTH EDITION, TABLE 11.6-9		
ALL EMISSION FACTORS ARE PRESENTED IN UNITS OF POUNDS POLLUTANT PER TON OF CLINKER PRODUCED		
CALCULATED EMISSIONS ARE FROM THE KILN ONLY		
ALL AMBIENT CONCENTRATIONS ARE PRESENTED IN UNITS OF MICROGRAMS PER CUBIC METER		
FDEP NTL ARE FROM AIR TOXICS WORKING LIST, VERSION 3.0		
HOURLY CLINKER PRODUCTION =	95.83	TPH
ANNUAL CLINKER PRODUCTION =	712500	TPY
AMBIENT AIR CONCENTRATIONS ARE CALCULATED FROM A "GENERIC" SCREEN RUN USING 1.0 G/S		

06-26-95
16:08:19

*** SCREEN-1.2 MODEL RUN ***
*** VERSION DATED 91/10 ***

Florida Rock Industries: GENERIC HAP @ 1.0 g/s

SIMPLE TERRAIN INPUTS:

SOURCE TYPE	=	POINT
EMISSION RATE (G/S)	=	1.000
STACK HEIGHT (M)	=	76.20
STK INSIDE DIAM (M)	=	2.87
STK EXIT VELOCITY (M/S)	=	14.1400
STK GAS EXIT TEMP (K)	=	369.00
AMBIENT AIR TEMP (K)	=	293.00
RECEPTOR HEIGHT (M)	=	.00
IOPT (1=URB,2=RUR)	=	2
BUILDING HEIGHT (M)	=	70.20
MIN HORIZ BLDG DIM (M)	=	14.00
MAX HORIZ BLDG DIM (M)	=	14.00

****
*** SUMMARY OF SCREEN MODEL RESULTS ***
****

CALCULATION PROCEDURE	MAX CONC (UG/M**3)	DIST TO MAX (M)	TERRAIN HT (M)	
SIMPLE TERRAIN	3.160	936.	0.	
BUILDING CAVITY-1	678.3	56.	--	(DIST = CAVITY LENGTH)
BUILDING CAVITY-2	678.3	56.	--	(DIST = CAVITY LENGTH)

****
** REMEMBER TO INCLUDE BACKGROUND CONCENTRATIONS **
****

BUOY. FLUX = 58.81 M**4/S**3; MOM. FLUX = 326.92 M**4/S**2.

*** FULL METEOROLOGY ***

****
*** SCREEN AUTOMATED DISTANCES ***
****

*** TERRAIN HEIGHT OF 0. M ABOVE STACK BASE USED FOR FOLLOWING DISTANCES **

DIST (M)	CONC (UG/M**3)	STAB	U10M (M/S)	USTK (M/S)	MIX HT (M)	PLUME HT (M)	SIGMA Y (M)	SIGMA Z (M)	DWASH
740.	2.296	1	1.0	1.2	464.2	463.2	194.5	264.2	NO
800.	2.774	1	1.0	1.2	464.2	463.2	204.0	303.8	NO
900.	3.139	1	1.0	1.2	464.2	463.2	220.0	379.6	NO
1000.	3.114	1	1.0	1.2	464.2	463.2	236.2	467.1	NO
1100.	2.949	1	1.0	1.2	464.2	463.2	252.5	566.2	NO
1200.	2.773	1	1.0	1.2	464.2	463.2	268.9	676.7	NO
1300.	2.614	1	1.0	1.2	464.2	463.2	285.2	798.5	NO
1400.	2.472	1	1.0	1.2	464.2	463.2	301.6	931.7	NO
1500.	2.344	1	1.0	1.2	464.2	463.2	318.0	1076.3	NO
1600.	2.230	1	1.0	1.2	464.2	463.2	334.3	1232.3	NO
1700.	2.126	1	1.0	1.2	464.2	463.2	350.6	1399.7	NO
1800.	2.032	1	1.0	1.2	464.2	463.2	366.9	1578.7	NO

1900.	1.946	1	1.0	1.2	4[illegible].2	463.2	383.1	1769.2	NO
2000.	1.867	1	1.0	1.2	464.2	463.2	399.2	1971.3	NO
2100.	1.795	1	1.0	1.2	464.2	463.2	415.3	2185.1	NO
2200.	1.728	1	1.0	1.2	464.2	463.2	431.4	2410.7	NO
2300.	1.667	1	1.0	1.2	464.2	463.2	447.3	2648.0	NO
2400.	1.616	2	1.0	1.2	464.2	463.2	353.7	306.3	NO
2500.	1.641	2	1.0	1.2	464.2	463.2	365.4	318.5	NO
2600.	1.654	2	1.0	1.2	464.2	463.2	377.2	330.8	NO
2700.	1.659	2	1.0	1.2	464.2	463.2	388.9	343.3	NO
2800.	1.656	2	1.0	1.2	464.2	463.2	400.6	355.8	NO
2900.	1.647	2	1.0	1.2	464.2	463.2	412.3	368.5	NO
3000.	1.632	2	1.0	1.2	464.2	463.2	423.9	381.2	NO
3500.	1.515	2	1.0	1.2	464.2	463.2	481.7	446.0	NO
4000.	1.377	2	1.0	1.2	464.2	463.2	538.8	512.3	NO
4500.	1.251	2	1.0	1.2	464.2	463.2	595.2	579.8	NO
5000.	1.218	3	1.0	1.2	441.4	440.4	453.7	286.1	NO
5500.	1.232	3	1.0	1.2	441.4	440.4	492.1	308.8	NO
6000.	1.220	3	1.0	1.2	441.4	440.4	530.3	331.6	NO
6500.	1.191	3	1.0	1.2	441.4	440.4	568.2	354.4	NO
7000.	1.151	3	1.0	1.2	441.4	440.4	605.8	377.1	NO
7500.	1.107	3	1.0	1.2	441.4	440.4	643.2	399.9	NO
8000.	1.061	3	1.0	1.2	441.4	440.4	680.3	422.6	NO
8500.	1.015	3	1.0	1.2	441.4	440.4	717.3	445.3	NO
9000.	.9709	3	1.0	1.2	441.4	440.4	754.0	467.9	NO
9500.	.9292	3	1.0	1.2	441.4	440.4	790.4	490.5	NO
10000.	.8902	3	1.0	1.2	441.4	440.4	826.7	513.0	NO
15000.	.6481	5	1.0	2.0	5000.0	167.4	584.0	99.0	NO
20000.	.6094	5	1.0	2.0	5000.0	167.4	752.8	112.4	NO
25000.	.5446	5	1.0	2.0	5000.0	167.4	916.0	121.7	NO
30000.	.4883	5	1.0	2.0	5000.0	167.4	1074.9	130.0	NO
40000.	.4000	5	1.0	2.0	5000.0	167.4	1382.0	144.2	NO
50000.	.3351	5	1.0	2.0	5000.0	167.4	1677.9	153.8	NO

MAXIMUM 1-HR CONCENTRATION AT OR BEYOND 740. M:

936.	3.160	1	1.0	1.2	464.2	463.2	226.0	410.6	NO

DIST = DISTANCE FROM THE SOURCE
CONC = MAXIMUM GROUND LEVEL CONCENTRATION
STAB = ATMOSPHERIC STABILITY CLASS (1=A, 2=B, 3=C, 4=D, 5=E, 6=F)
U10M = WIND SPEED AT THE 10-M LEVEL
USTK = WIND SPEED AT STACK HEIGHT
MIX HT = MIXING HEIGHT
PLUME HT= PLUME CENTERLINE HEIGHT
SIGMA Y = LATERAL DISPERSION PARAMETER
SIGMA Z = VERTICAL DISPERSION PARAMETER
DWASH = BUILDING DOWNWASH:
DWASH= MEANS NO CALC MADE (CONC = 0.0)
DWASH=NO MEANS NO BUILDING DOWNWASH USED
DWASH=HS MEANS HUBER-SNYDER DOWNWASH USED
DWASH=SS MEANS SCHULMAN-SCIRE DOWNWASH USED
DWASH=NA MEANS DOWNWASH NOT APPLICABLE, X<3*LB

*** CAVITY CALCULATION - 1 ***
CONC (UG/M**3) = 678.3
CRIT WS @10M (M/S) = 1.00
CRIT WS @ HS (M/S) = 1.50
DILUTION WS (M/S) = 1.00
CAVITY HT (M) = 156.87
CAVITY LENGTH (M) = 56.47
ALONGWIND DIM (M) = 14.00

*** CAVITY CALCULATION - 2 ***
CONC (UG/M**3) = 678.3
CRIT WS @10M (M/S) = 1.00
CRIT WS @ HS (M/S) = 1.50
DILUTION WS (M/S) = 1.00
CAVITY HT (M) = 156.87
CAVITY LENGTH (M) = 56.47
ALONGWIND DIM (M) = 14.00

****
*** END OF SCREEN MODEL OUTPUT ***
****

APPENDIX B

HAP MEASUREMENTS
AVERAGE HAP EMISSIONS

HAP MEASUREMENTS

EMISSION RATES ARE CONVERTED TO LB/TON CLINKER

RUN #	K&A #	FUEL	CLINKER	ACETONE		ANTIMONY		ARSENIC		BENZENE		BERYLLIUM	
				PPH	LB/TON	PPH	LB/TON	PPH	LB/TON	PPH	LB/TON	PPH	LB/TON
1	263-92-01	COAL/TDF	34.3			< 0.0043	< 0.000125	< 0.001	< 2.92E-05	0.0698	0.002034985	< 0.001	< 2.92E-05
2	263-92-01	COAL/TDF	33.7			< 0.0046	< 0.000136	< 0.0011	< 3.26E-05	0.0698	0.002071217	< 0.0011	< 3.26E-05
3	263-92-01	COAL/TDF	33.8			< 0.0041	< 0.000121	< 0.0009	< 2.66E-05	0.0698	0.002065089	< 0.0009	< 2.66E-05
1	263-92-01	COAL	36.1			< 0.0056	< 0.000155	< 0.0013	< 3.6E-05	0.0196	0.000542936	< 0.0013	< 3.6E-05
2	263-92-01	COAL	35.5			< 0.0053	< 0.000149	< 0.0012	< 3.38E-05	0.0196	0.000552113	< 0.0012	< 3.38E-05
3	263-92-01	COAL	35.9			< 0.0052	< 0.000145	< 0.0012	< 3.34E-05	0.0196	0.000545961	< 0.0012	< 3.34E-05
1	307-90-01	COAL	78.7	0.151	0.001919					0.449	0.00570521		
2	307-90-01	COAL	79.1	0.158	0.001997					0.405	0.005120101		
3	307-90-01	COAL	78.5	0.114	0.001452					0.395	0.005031847		
4	307-90-01	COAL	77.9					2.14E-03	2.75E-05				
5	307-90-01	COAL	77.9					2.16E-03	2.77E-05				
6	307-90-01	COAL	79.4					1.95E-03	2.46E-05				
1	521-93-03	COAL	77.2	< 4.30E-05	< 5.57E-07			< 0.00176	2.28E-05	4.50E-02	0.000582902		
2	521-93-03	COAL	77.2	< 4.30E-05	< 5.57E-07			< 0.00172	2.23E-05	4.80E-02	0.000621762		
3	521-93-03	COAL	77.2	< 4.50E-05	< 5.83E-07			< 0.00173	2.24E-05	5.70E-02	0.000738342		
4	521-93-03	COAL	77.2	< 4.50E-05	< 5.83E-07					6.30E-02	0.000816062		
5	521-93-03	COAL	77.2	< 4.50E-05	< 5.83E-07					6.20E-02	0.000803109		
6	521-93-03	COAL	77.2	< 4.50E-05	< 5.83E-07					7.30E-02	0.000945696		
7	521-93-03	COAL/TDF	75.1	1.20E-02	0.00016					4.10E-02	0.000545939		
8	521-93-03	COAL/TDF	75.1	1.20E-02	0.00016					4.20E-02	0.000559254		
9	521-93-03	COAL/TDF	75.1	4.90E-02	0.000652					3.90E-02	0.000519308		
10	521-93-03	COAL/TDF	75.1	1.70E-02	0.000226					4.10E-02	0.000545939		
11	521-93-03	COAL/TDF	75.1	1.70E-02	0.000226					4.10E-02	0.000545939		
12	521-93-03	COAL/TDF	75.1	1.90E-02	0.000253					4.30E-02	0.00057257		

	ACETONE	ANTIMONY	ARSENIC	BENZENE	BERYLLIUM
AVERAGE (LB/TON CLINKER) =	4.70E-04	1.39E-04	2.82E-05	1.50E-03	3.19E-05
AP-42, 5TH EDITION, TABLE 11.6-9 =	3.70E-04	N/A	1.30E-05	ESP 3.10E-03	FF 6.60E-07
				FF 1.60E-02	

HAP MEASUREMENTS

EMISSION RATES ARE CONVERTED TO

RUN #	K&A #	FUEL	CLINKER	BROMOMETHANE PPH	BROMOMETHANE LB/TON	CADMIUM PPH	CADMIUM LB/TON	CARBON DISULFIDE PPH	CARBON DISULFIDE LB/TON	CHLOROBENZENE PPH	CHLOROBENZENE LB/TON	CHROMIUM PPH	CHROMIUM LB/TON
1	263-92-01	COAL/TDF	34.3			< 0.003	< 8.75E-05					0.0084	0.000245
2	263-92-01	COAL/TDF	33.7			< 0.0032	< 9.5E-05					0.0106	0.000315
3	263-92-01	COAL/TDF	33.8			< 0.0028	< 8.28E-05					0.0053	0.000157
1	263-92-01	COAL	36.1			< 0.0039	< 0.000108					0.0035	9.7E-05
2	263-92-01	COAL	35.5			< 0.0037	< 0.000104					0.0136	0.000383
3	263-92-01	COAL	35.9			< 0.0036	< 0.0001					0.0161	0.000448
1	307-90-01	COAL	78.7					0.064	0.000813	0.01	0.000127		
2	307-90-01	COAL	79.1					0.107	0.001353	0.029	0.000367		
3	307-90-01	COAL	78.5					0.031	0.000395	0.032	0.000408		
4	307-90-01	COAL	77.9									1.06E-02	0.000136
5	307-90-01	COAL	77.9									9.09E-03	0.000117
6	307-90-01	COAL	79.4									1.26E-02	0.000159
1	521-93-03	COAL	77.2	< 2.10E-05	< 2.72E-07			5.50E-03	7.12E-05	1.40E-02	0.000181	< 0.00205	< 2.66E-05
2	521-93-03	COAL	77.2	< 1.50E-03	< 1.94E-05			4.40E-03	5.7E-05	1.30E-02	0.000168	< 0.00201	< 2.6E-05
3	521-93-03	COAL	77.2	< 2.20E-05	< 2.85E-07			6.00E-03	7.77E-05	1.50E-02	0.000194	< 0.00201	< 2.6E-05
4	521-93-03	COAL	77.2	< 2.20E-05	< 2.85E-07			7.30E-03	9.46E-05	1.60E-02	0.000207		
5	521-93-03	COAL	77.2	< 2.20E-05	< 2.85E-07			< 2.20E-05	< 2.85E-07	1.80E-02	0.000233		
6	521-93-03	COAL	77.2	< 2.20E-05	< 2.85E-07			< 2.20E-05	< 2.85E-07	1.90E-02	0.000246		
7	521-93-03	COAL/TDF	75.1	1.30E-03	1.73E-05			8.70E-03	0.000116	9.60E-03	0.000128		
8	521-93-03	COAL/TDF	75.1	9.40E-04	1.25E-05			5.80E-03	7.72E-05	1.40E-02	0.000186		
9	521-93-03	COAL/TDF	75.1	2.40E-03	3.2E-05			5.60E-03	7.46E-05	1.30E-02	0.000173		
10	521-93-03	COAL/TDF	75.1	1.30E-03	1.73E-05			4.80E-03	6.39E-05	1.40E-02	0.000186		
11	521-93-03	COAL/TDF	75.1	8.50E-04	1.13E-05			4.50E-03	5.99E-05	1.20E-02	0.00016		
12	521-93-03	COAL/TDF	75.1	8.20E-04	1.09E-05			5.10E-03	6.79E-05	1.30E-02	0.000173		

	BROMOMETHANE		CADMIUM		CARBON DISULFIDE		CHLOROBENZENE		CHROMIUM	
AVERAGE (LB/TON CLINKER) =		1.02E-05		9.63E-06		2.21E-04		2.09E-04		1.78E-04
AP-42, 5TH EDITION, TABLE 11.6-9 =	ESP	4.30E-05	ESP	8.30E-06	ESP	1.10E-04	ESP	1.60E-05	ESP	7.70E-06
			FF	2.20E-06					FF	1.40E-04

HAP MEASUREMENTS

EMISSION RATES ARE CONVERTED TO

RUN #	K&A #	FUEL	CLINKER	COPPER PPH	COPPER LB/TON	ETHYLBENZENE PPH	ETHYLBENZENE LB/TON	HYDROGEN CHLORIDE PPH	HYDROGEN CHLORIDE LB/TON	LEAD PPH	LEAD LB/TON	MERCURY PPH	MERCURY LB/TON
1	263-92-01	COAL/TDF	34.3	0.008	0.000233					0.0304	0.000886	0.0114	0.000332
2	263-92-01	COAL/TDF	33.7	0.0074	0.00022					0.0268	0.000795	0.0136	0.000404
3	263-92-01	COAL/TDF	33.8	0.0038	0.000112					0.0301	0.000891	0.0073	0.000216
1	263-92-01	COAL	36.1	0.0009	2.49E-05					0.0156	0.000432	0.0172	0.000476
2	263-92-01	COAL	35.5	0.0008	2.25E-05					0.0177	0.000499	0.0056	0.000158
3	263-92-01	COAL	35.9	0.0028	7.8E-05					0.0181	0.000504	0.0047	0.000131
1	307-90-01	COAL	78.7			0.006	7.62E-05	62.88	0.798983482				
2	307-90-01	COAL	79.1			0.015	0.00019	80.84	1.021997472				
3	307-90-01	COAL	78.5			0.015	0.000191	71.14	0.906242038				
4	307-90-01	COAL	77.9							1.20E-02	0.000154	1.22E-02	0.000157
5	307-90-01	COAL	77.9							1.80E-02	0.000231	1.33E-02	0.000171
6	307-90-01	COAL	79.4							5.99E-03	7.54E-05	2.10E-02	0.000264
1	521-93-03	COAL	77.2			5.00E-03	6.48E-05	0.47	0.006088083	< 0.00763	< 9.88E-05	0.02935	0.00038
2	521-93-03	COAL	77.2			5.00E-03	6.48E-05	0.44	0.005699482	< 0.00747	< 9.68E-05	0.00233	3.02E-05
3	521-93-03	COAL	77.2			5.10E-03	6.61E-05	0.42	0.005440415	< 0.00834	< 0.000108	0.00728	9.43E-05
4	521-93-03	COAL	77.2			5.80E-03	7.51E-05						
5	521-93-03	COAL	77.2			6.80E-03	8.81E-05						
6	521-93-03	COAL	77.2			7.10E-03	9.2E-05						
7	521-93-03	COAL/TDF	75.1			5.00E-03	6.66E-05	0.36	0.004793609				
8	521-93-03	COAL/TDF	75.1			6.10E-03	8.12E-05	0.32	0.004260985				
9	521-93-03	COAL/TDF	75.1			5.30E-03	7.06E-05	0.38	0.00505992				
10	521-93-03	COAL/TDF	75.1			5.90E-03	7.86E-05						
11	521-93-03	COAL/TDF	75.1			4.90E-03	6.52E-05						
12	521-93-03	COAL/TDF	75.1			6.00E-03	7.99E-05						

	COPPER	ETHYLBENZENE	HYDROGEN CHLORIDE	LEAD	MERCURY
AVERAGE (LB/TON CLINKER) =	1.15E-04	9.00E-05	3.07E-01	3.98E-04	2.34E-04
AP-42, 5TH EDITION, TABLE 11.6-9 =	FF 5.30E-03	ESP 1.90E-05	ESP 4.90E-02	ESP 7.10E-04	ESP 2.20E-04
			FF 1.40E-01	FF 7.50E-05	FF 2.40E-05

HAP MEASUREMENTS

EMISSION RATES ARE CONVERTED TO

RUN #	K&A #	FUEL	CLINKER	NICKEL PPH	NICKEL LB/TON		SELENIUM PPH		SELENIUM LB/TON		SILVER PPH		SILVER LB/TON
1	263-92-01	COAL/TDF	34.3	0.0047	0.000137	<	0.0668	<	0.001948	<	0.0013	<	3.79E-05
2	263-92-01	COAL/TDF	33.7	0.0042	0.000125	<	0.0706	<	0.002095	<	0.0014	<	4.15E-05
3	263-92-01	COAL/TDF	33.8	0.0019	5.62E-05	<	0.0627	<	0.001855	<	0.0013	<	3.85E-05
1	263-92-01	COAL	36.1	0.0009	2.49E-05	<	0.0869	<	0.002407	<	0.0017	<	4.71E-05
2	263-92-01	COAL	35.5	0.0029	8.17E-05	<	0.0823	<	0.002318	<	0.0016	<	4.51E-05
3	263-92-01	COAL	35.9	0.004	0.000111	<	0.0805	<	0.002242	<	0.0016	<	4.46E-05
1	307-90-01	COAL	78.7										
2	307-90-01	COAL	79.1										
3	307-90-01	COAL	78.5										
4	307-90-01	COAL	77.9										
5	307-90-01	COAL	77.9										
6	307-90-01	COAL	79.4										
1	521-93-03	COAL	77.2										
2	521-93-03	COAL	77.2										
3	521-93-03	COAL	77.2										
4	521-93-03	COAL	77.2										
5	521-93-03	COAL	77.2										
6	521-93-03	COAL	77.2										
7	521-93-03	COAL/TDF	75.1										
8	521-93-03	COAL/TDF	75.1										
9	521-93-03	COAL/TDF	75.1										
10	521-93-03	COAL/TDF	75.1										
11	521-93-03	COAL/TDF	75.1										
12	521-93-03	COAL/TDF	75.1										

	NICKEL	SELENIUM		SILVER	
AVERAGE (LB/TON CLINKER) =	8.93E-05		2.14E-03		4.24E-05
AP-42, 5TH EDITION, TABLE 11.6-9 =	N/A	ESP	1.50E-04	FF	6.10E-07
		FF	2.00E-04		

HAP MEASUREMENTS

EMISSION RATES ARE CONVERTED TO

RUN #	K&A #	FUEL	CLINKER	STYRENE PPH	STYRENE LB/TON	TOLUENE PPH	TOLUENE LB/TON	XYLENE PPH	XYLENE LB/TON	ZINC PPH	ZINC LB/TON
1	263-92-01	COAL/TDF	34.3							0.0535	0.00156
2	263-92-01	COAL/TDF	33.7							0.4871	0.014454
3	263-92-01	COAL/TDF	33.8							0.4485	0.013269
1	263-92-01	COAL	36.1							0.8902	0.024659
2	263-92-01	COAL	35.5							0.6006	0.016918
3	263-92-01	COAL	35.9							0.7168	0.019967
1	307-90-01	COAL	78.7	0.013	0.000165	0.084	0.001067	0.023	0.000292		
2	307-90-01	COAL	79.1	0.043	0.000544	0.083	0.001049	0.05	0.000632		
3	307-90-01	COAL	78.5	0.038	0.000484	0.09	0.001146	0.057	0.000726		
4	307-90-01	COAL	77.9							13.95	0.179076
5	307-90-01	COAL	77.9							6.52	0.083697
6	307-90-01	COAL	79.4							6.7	0.084383
1	521-93-03	COAL	77.2	1.90E-02	0.000246	3.20E-02	0.000415	0.0197	0.000255	0.00558	7.23E-05
2	521-93-03	COAL	77.2	1.80E-02	0.000233	4.50E-02	0.000583	0.0206	0.000267	0.00546	7.07E-05
3	521-93-03	COAL	77.2	2.50E-02	0.000324	4.70E-02	0.000609	0.0224	0.00029	0.00633	8.2E-05
4	521-93-03	COAL	77.2	3.10E-02	0.000402	5.40E-02	0.000699	0.0266	0.000345		
5	521-93-03	COAL	77.2	3.40E-02	0.00044	6.20E-02	0.000803	0.0294	0.000381		
6	521-93-03	COAL	77.2	3.30E-02	0.000427	5.50E-02	0.000712	0.0257	0.000333		
7	521-93-03	COAL/TDF	75.1	1.00E-02	0.000133	2.90E-02	0.000386	0.0128	0.00017		
8	521-93-03	COAL/TDF	75.1	1.40E-02	0.000186	3.60E-02	0.000479	0.0179	0.000238		
9	521-93-03	COAL/TDF	75.1	1.30E-02	0.000173	3.10E-02	0.000413	0.0153	0.000204		
10	521-93-03	COAL/TDF	75.1	1.40E-02	0.000186	3.30E-02	0.000439	0.0169	0.000225		
11	521-93-03	COAL/TDF	75.1	9.80E-03	0.00013	4.00E-02	0.000533	0.014	0.000186		
12	521-93-03	COAL/TDF	75.1	1.30E-02	0.000173	3.50E-02	0.000466	0.0169	0.000225		

	STYRENE	TOLUENE	XYLENE	ZINC
AVERAGE (LB/TON CLINKER) =	2.83E-04	6.53E-04	3.18E-04	3.65E-02
AP-42, 5TH EDITION, TABLE 11.6-9 =	ESP 1.50E-06	ESP 1.90E-04	ESP 1.30E-04	ESP 5.40E-04
				FF 3.40E-04

APPENDIX C

REGIONAL HAZE ANALYSIS

Appendix C REGIONAL HAZE ANALYSIS

Regional haze analysis was performed for the receptive Class I areas of Chassahowitzka and Okefenokee NWRs. Methodology outlined in Appendix B of the Interagency Workgroup on Air Quality Modeling (IWAQM) document was followed. The results of this analysis are presented in Table 1. The maximum projected visibility degradations at Chassahowitzka and Okefenokee NWRs are 0.08 deciview and 0.09 deciview respectively. A deciview change of 1.0 or less is generaly imperceptable as noted in a letter from Noreen K. Clough dated May 30, 1995. These impact values were calculated based on a measured background visibility range of 65 km. Calculations for Chassahowitzka NWR are shown in Table 1A and Table 1B shows calculations for Okefenokee NWR. Calculation steps are numbered 1 through 15 and the derivation of each calculation and value used is provided at the bottom of Table 1.

Local meteorological conditions for the days of the two maximum impact periods are provided in Tables 2A and 2B. Distance from source to Class I receptors are also provided in Tables 2A and 2B. Calculations of the maximum transport time form the source to Chassahowitzka and Okefenokee NWRs are made and are shown to be 12 and 11.4 hours respectively. Maximum transport time is used in Table 4 to calculate the SO_2 to SO_4 conversion percent used in calculation 8 and 9. Daily relative humidity is averaged for the two maximum impact days for each Class 1 area and the results are provided. These averages are used to derive the Relative Humidity Factor from Figure B-1 in the IWAQM document. The Relative Humidity factor is used in calculations 10 and 14 in Table 1.

A summary of the Class 1 maximum impacts is provided in Table 3. The impacts are broken down by the two pollutants, SO_2 and PM10, and for the two Class 1 areas. Since long range transport modeling was performed with a unit emission rate, the maximum 24-hour predicted impacts are derived from the product of the actual emission and the modeled unit impact. These maximum 24-hour predicted impact values are used in calculations 1, 5, 6 for SO_2 and 11, 13 and 14 for PM10 in Table 1. Calculations for the conversion of SO_2 to SO_4 are provided in Table 4. A conversion rate of 3% per hour is used to derive each hour's contribution to the total SO_2 to SO_4 conversion. The final percent is a sum of the total SO_4 converted over the maximum 24-hour predicted impact. For Chassahowitzka and Okefenokee NWRs the percent conversions are 31 % and 29 % respectively.

Regional Haze Analysis For Florida Rock Industries Incorporated

Table 1A

CLASS I CHASSAHOWITZKA N.W.R.

(1) SO2 (µg/m^3)	(2) Background Visibility (km)	(3) Ambient b(ext)a	(4) Acid Mist Impact H2SO4 (µg/m^3)	(5) SO4 (µg/m^3)	(6) (NH4)SO2 (µg/m^3)	(7) Transport Time (hrs)	(8) Conversion
0.0463	65	0.0602	0.00000	0.0694	0.0955	12.0	31%
(9) AT 31% (NH4)SO2 CONVERSION (µg/m^3)	**(10) Relative Humidity FACTOR @ 77%**	**(11) PM-10 (µg/m^3)**	**(12) Source b(ext)s (NH4)SO2**	**(13) Source b(ext)s PM10**	**(14) Total Source b(ext)s**	**(15) Deciview**	**Is Deciview Greater than 1 ?**
0.0292	3.0	0.0748	0.00026	0.00022	0.00049	0.08	NO

Table 1B

CLASS I OKEFENOKEE N.W.R.

(1) SO2 (µg/m^3)	(2) Background Visibility (km)	(3) Ambient b(ext)a	(4) Acid Mist Impact H2SO4 (µg/m^3)	(5) SO4 (µg/m^3)	(6) (NH4)SO2 (µg/m^3)	(7) Transport Time (hrs)	(8) Conversion
0.0446	65	0.0602	0.00000	0.0670	0.0921	12.0	29%
(9) AT 31% (NH4)SO2 CONVERSION (µg/m^3)	**(10) Relative Humidity FACTOR @ 83%**	**(11) PM-10 (µg/m^3)**	**(12) Source b(ext)s (NH4)SO2**	**(13) Source b(ext)s PM10**	**(14) Total Source b(ext)s**	**(15) Deciview**	**Is Deciview Greater than 1 ?**
0.0270	4.2	0.0721	0.00034	0.00022	0.00056	0.09	NO

(1) Maximum 24-hour SO2 Impact at Class I Receptor. Provided in Table 3
(2) Measured Background Visibility Range as recomended by FWS
(3) Ambient b(ext)a = 3.912/Background Visibility
(4) Acid Mist Impact = 0.15/4 * SO2 Impact * 96/98. None at Florida Rock Induistries.
(5) SO4 = SO2 Impact * 1.5
(6) 100 % (NH4)SO2 Impact = 1.375 * (SO4 + Acid Mist)
(7) Transport Time (hours) = Maximum Distance / Average daily wind speed. As Calculated in Table 2.
(8) Conversion = Transport Time * 0.03 (% / hour). As calculated in Tables 4a & 4b
(9) (NH4)SO2 Conversion = % Conversion * (NH4)SO2)
(10) Relative Humidity Factor From Meteorology and Figure B-1 IWAQM
(11) Maximum 24-hour PM10 Impact at Class I Receptor
(12) Source b(ext)s (NH4)SO4 = 0.003 * Relative Humidity Factor * (NH4)SO4
(13) Source b(ext)s PM10 = 0.003 * Relative Humidity Factor (1) * PM10
(14) Total Source b(ext)s = b(ext)s (NH4)SO4 + b(ext)s PM10
(15) Deciview = 10 * LN [1 + (Total b(ext)s / b(ext)a)]

Table 2A
Maximum Transport Time To
CHASSAHOWITZKA N.W.R.

1986 Meteorological Conditions For Gainesville Municipal Airport

Month	Day	Hour	WD Deg./10	WS Knots	R/H %
10	15	0	31	4	90
10	15	1	0	3	90
10	15	2	36	4	90
10	15	3	0	3	93
10	15	4	35	6	90
10	15	5	36	6	93
10	15	6	35	4	93
10	15	7	36	7	90
10	15	8	10	5	87
10	15	9	36	5	81
10	15	10	3	8	66
10	15	11	1	7	63
10	15	12	11	4	66
10	15	13	2	7	61
10	15	14	36	6	66
10	15	15	35	9	68
10	15	16	3	7	61
10	15	17	3	6	65
10	15	18	4	4	68
10	15	19	6	4	70
10	15	20	33	5	78
10	15	21	36	6	73
10	15	22	35	5	73
10	15	23	34	5	84
Average				5.42	77
				10.03	km/hr

** CLASS I RECEPTORS CHASSAHOWITZKA N.W.R.

East m	North m	Distance km
-6510	-119740	120
-6510	-117740	118
-6510	-115640	116
-6110	-113540	114
-4810	-111440	112
-3810	-109240	109
-3110	-107140	107
-4410	-104840	105
-5710	-102040	102
-7810	-102040	102
-10310	-102040	103
-12810	-102040	103
-15310	-102040	103
	Maximum	120

Transport Time = Max Dist / Ave. Wind Speed
= 12.0 Hours

Table 2B
Maximum Transport Time To
OKEFENOKEE N.W.R.

1986 Meteorological Conditions For Gainesville Municipal Airport

** CLASS I RECEPTORS OKEFENOKEE N.W.R.

Month	Day	Hour	WD Deg./10	WS Knots	R/H %	East m	North m	Distance km
5	19	0	16	7	82	36190	96560	103
5	19	1	17	7	81	42905	96520	106
5	19	2	15	5	87	44190	104560	114
5	19	3	15	5	87	44652	111280	120
5	19	4	15	5	84	44727	118669	127
5	19	5	16	8	87	44802	126058	134
5	19	6	16	5	87	44896	135293	143
5	19	7	16	5	82	41807	144562	150
5	19	8	15	10	76	33954	153885	158
5	19	9	18	8	72	32954	152985	156
5	19	10	21	8	67	27954	148485	151
5	19	11	20	8	63	22954	143985	146
5	19	12	21	8	59	17954	139485	141
5	19	13	0	3	85	12954	134985	136
5	19	14	4	9	90	8954	131385	132
5	19	15	2	5	79	4949	126536	127
5	19	16	11	10	76	6949	119336	120
5	19	17	34	5	85	9449	110336	111
5	19	18	33	15	87	11949	101336	102
5	19	19	4	7	93	18558	98120	100
5	19	20	15	8	93	24558	97520	101
5	19	21	17	11	97	30558	96920	102
5	19	22	12	7	97	35058	96470	103
5	19	23	16	12	93			
5	20	0	18	6	93		Maximum	158
Average				7.48	83			
				13.85	km/hr			

Transport Time = Max Dist / Ave. Wind Speed
= 11.4 Hours

Table 3

CLASS I Maximum Impact Summary

	Mesopuff Modeled Unit Impact (µg/m^3) / (g/s)	On Date	Emissions SO2 (g/s)	Emissions PM10 (g/s)	Maximum Predicted Impact SO2 (µg/m^3)	Maximum Predicted Impact PM10
CHASSAHOWITZKA N.W.R.	0.00684	05/05/8	6.77	10.94	0.0463	0.0748
OKEFENOKEE N.W.R.	0.0066	10/15/8	6.77	10.94	0.0446	0.0721

Table 4

SO2 to SO4 Conversion

CHASSAHOWITZKA N.W.R.

Hour	SO2	SO4
1	0.04629	0.00139
2	0.04490	0.00135
3	0.04356	0.00131
4	0.04225	0.00127
5	0.04098	0.00123
6	0.03975	0.00119
7	0.03856	0.00116
8	0.03740	0.00112
9	0.03628	0.00109
10	0.03519	0.00106
11	0.03414	0.00102
12	0.03311	0.00099
	Σ SO4 =	0.01417
CONVERSION =		31%

OKEFENOKEE N.W.R.

Hour	SO2	SO4
1	0.04465	0.00134
2	0.04331	0.00130
3	0.04201	0.00126
4	0.04075	0.00122
5	0.03953	0.00119
6	0.03834	0.00115
7	0.03719	0.00112
8	0.03607	0.00108
9	0.03499	0.00105
10	0.03394	0.00102
11	0.03292	0.00099
11.4	0.03194	0.00038
	Σ SO4 =	0.01309
CONVERSION =		29%