LAW OFFICES

OERTEL, HOFFMAN, FERNANDEZ & COLE, P.A.

301 SOUTH BRONOUGH STREET
SUITE 500
TALLAHASSEE, FLORIDA 32301

(850) 521-0700
FAX (850) 521-0720

MAILING ADDRESS:
POST OFFICE BOX 1110
TALLAHASSEE, FLORIDA 32302-1110

http://www.ohfc.com

TIMOTHY P. ATKINSON
JEFFREY BROWN
M. CHRISTOPHER BRYANT
C. ANTHONY CLEVELAND
TERRY COLE
SEGUNDO J. FERNANDEZ
SCOTT W. FOLTZ
KENNETH F. HOFFMAN
CHRISTOPHER D. JOHNSTON
KENNETH G. OERTEL
PATRICIA A. RENOVITCH

September 27, 2000

Via Facsimile (922-5380) and U.S. Mail

Mr. Kirby B. Green, III
Deputy Secretary
Florida Department of Environmental Protection
3900 Commonwealth Blvd., MS-47
Tallahassee, FL 32399-3000

RE: Florida Rock Industries
Thompson S. Baker Cement Plant
Newberry, Alachua County

Dear Mr. Green:

This is a follow-up to your letter of September 20, 2000 and my letter in response of the same date.

Following our exchange of correspondence, Florida Rock conducted a stack compliance test for VOC emissions on Saturday, September 23, 2000. The test, which was previously scheduled to be conducted on September 22, 2000, was postponed for one day to enable the facility to operate under representative conditions. DEP was advised of the postponement by e-mail on September 22nd, (Attachment 1).

The compliance test was successfully completed. The measured VOC emissions were below the limit in the permit. I am enclosing a copy of a letter from Dr. John B. Koogler to Chris Kirts of FDEP, Jacksonville, dated September 25, 2000 reporting a summary of the results (Attachment 2). A complete test report is being prepared for prompt submission to the agency.

I am also enclosing a letter, also dated September 25, 2000, from Florida Rock's Vice President Fred W. Cohrs to Chris Kirts, (Attachment 3) reporting on various steps taken by the company to assure continued operation in full compliance with all applicable requirements.

Mr. Cohrs' letter referred to the company's efforts to locate mill scale with low THC content. We can report to you today that the company's pursuit of this option has been successful, and that the company is now ready to commence production of Type II cement using low THC mill scale as the source of iron for the production process. In an overabundance of caution, the company had the new mill scale tested by *Environmental Conservation Laboratories, Inc (ENCO) of 4810 Executive Park Ct., Jacksonville, FL* . The test results were received by Florida Rock on September 22. A copy of those results are enclosed (Attachment 4). Additionally, on September 26, Mr. Cary Cohrs, Manager of the Thompson S. Baker Cement Plant visited *Levand Steel & Supply Corp. of 1849 Crestwood Blvd., Birmingham, AL* to ascertain the long-term availability of this clean mill scale. Please note that in the test results, at page 2 of 4, a side-by-side comparison of hydrocarbon content of the new mill scale (from Levand Steel) is made. The mill scale previously used at Florida Rock is labeled "Bulk Material". This comparison reveals that the previously used mill scale, which contributed to the anomalous high VOC readings, contained 11,000 mg/Kg (approximately 1.1%) total hydrocarbons by weight, as compared to the new low THC mill scale, (approximately 0.062%) total hydrocarbons by weight. This represents approximately 1/18th of the total hydrocarbon input under the previous operation.

Your letter of September 20 requested that Florida Rock cease adding mill scale to its cement production process, noting that the type of mill scale utilized by Florida Rock was the suspected source of the VOC emissions. The company proposes to immediately start using the new mill scale which it believes will enable it to operate in full compliance with the current limits for VOC in the permit. The company seeks your concurrence in this course of action, and would, of course, schedule an appropriate stack test upon reaching representative operating conditions with the new mill scale in the raw mix, to demonstrate continued compliance with the permitted VOC limit.

Please advise as soon as possible. The company's management and technical consultants are available at a moments notice to answer any questions you may have.

Sincerely,

Segundo J. Fernandez

SJF:bmg
Enclosure
cc: John D. Baker, II
Fred W. Cohrs
Cary Cohrs
Larry Morgan
Ernest Frey
Chris Kirts
Trina Vielhauer
Howard Rhodes
Al Linero
George Townsend
Lalit Lalwani

GENERAL OFFICE: 155 East 21st Street / P.O. Box 4667 / Jacksonville, Florida 32201 / (904) 355-1781
FLORIDA ROCK INDUSTRIES INC Mining, Ready Mix Concrete, and Construction Products

September 25, 2000

Mr. Chris Kirts
Florida Department of
Environmental Protection
7825 Baymeadows Way, Suite B-200
Jacksonville, FL 32256-7590

Dear Mr. Kirts:

Florida Rock Industries, Inc. has successfully completed its retest for VOC emissions at the Thompson S. Baker Cement Plant in Newberry on Saturday, September 23, 2000. The measured VOC emissions are below the permitted limit.

To accomplish this, the plant omitted the use of mill scale as one of its raw materials and commenced to produce only ASTM Type I cement. After the completion of the test the production of Type I was continued, without the use of any mill scale.

The compliance test report is being prepared by Koogler & Associates and will be completed in the next few days.

As we had correctly surmised, after substantial testing of all of our raw materials, the mill scale has been the major contributor to the formation of volatile organic matter. We worked diligently to identify the cause of the VOC emissions and took prompt actions to bring the emissions into compliance with our permit limits. Most mill scale available in this country contain amounts of hydrocarbons originating in lubricants used in the milling process.

In the meantime we located a limited supply of mill scale with low THC content and have received several truckloads of this material. The material comes from a steel plant which uses a flotation process to separate the spent grease from the steel flakes and attempts to make a THC- free mill scale. We are told the separated grease is being reused for lubrication. Representatives of Florida Rock are scheduled to visit the steel plant offering this material for a personal inspection of the cleaning process and its effectiveness. The samples we received of this material show a presence of only 0.04 % THC. This compares to values of as high as 1% in previously supplied mill scale. We hope to verify that this cleanliness can be reliably maintained and that the quantity of clean mill scale produced is sufficient for our needs. If the answers are affirmative, we will use the material to produce Type II cement to meet FDOT specifications. The difference in the THC contents leads us to believe that the permitted VOC limits will continue to be met.

Simultaneously we are in contact with the Oak Ridge National Laboratories in Oak Ridge, Tennessee to discuss a technical assistance agreement for the production of THC- free mill scale. Oak Ridge has done extensive research in bio-degradation of organic compounds for the Department of Energy and has developed notable expertise in the destruction of organic matter, turning it into harmless carbon dioxide and water molecules. Based on the success of this method, we would be able to tap a large supply of mill scale, which is now being used without prior treatment by most cement companies in this and other countries. The disadvantage of bio-

remediation is the time frame. Bio-remediation of organic matter may take as long as 14 months, leaving us unable to satisfy our requirement for clean material for some period of time, should the present promising source not prove to be reliable or sufficient.

It is possible that more steel mills will make the capital investments to clean up their mill scale and recycle the grease, which would make more material available to our industry. We will continue to search for additional sources.

Another option to produce clean mill scale for our use is the construction of a mill scale pretreatment facility, which would be somewhat similar to a remediation plant for oil soaked soils, using asphalt driers with afterburners. Given the relatively small amount of mill scale consumed by our plant, pretreatment may be totally cost prohibitive. Our inquiries to existing soils remediation operators have not met with encouraging responses. At this time none of the facilities we have been able to contact are available to pretreat our mill scale.

On a related matter, you have pointed out in our meetings, that the Title V permit must reflect the planned TDF facility. The construction permit allows up to 30% replacement of coal with TDF, but so far the company has not installed a TDF system, nor used TDF in its operation. We have scheduled a visit to recently installed systems to determine if the latest technology satisfies our requirements and, at the same time find out how much iron addition can be expected from the ash contained in the tires. This source of iron may further help to reduce our mill scale requirements.

We are certain of a short-term solution toward meeting the VOC limits at the TSB Cement Plant, but should continue to discuss and explore all options with the department, which may include short-term relief for a long-term answer.

Your co-operation and assistance will be appreciated.

Yours very truly,

Fred W. Cohrs

Fred W. Cohrs
Vice President

FWC/bc

Cc: Mr. Howard Rhodes
Mr. Al Linero
Mr. Ernie Frey
Mr. Kirby Green
Mr. John Baker
Segundo Fernandez, Esq.

KOOGLER & ASSOCIATES
ENVIRONMENTAL SERVICES
4014 NW THIRTEENTH STREET
GAINESVILLE, FLORIDA 32609
352/377-5822 • FAX/377-7158

Project 187-00-09

FAX TRANSMITTAL FORM

TO: Mr. Chris Kirts, 904-448-4366
Mr. Kirby Green, 850-922-5380
Mr. Larry Morgan, 850-488-2439
Ms. Trina Vielhauer, 850-488-2439
Mr. Howard Rhodes, FDEP, 850-922-6979
Mr. Al Linero, FDEP, 850-922-6979
Mr. Ernest Frey, FDEP, Jacksonville, 904-448--4366
Mr. Lalit Lalwani, FDEP, Gainesville, 352-333-2856
Mr. Fred Cohrs, FRI, 904-791-1804
Mr. Cary Cohrs, FRI, 352-472-2449
Mr. George Townsend, FRI, 352-472-2449
Mr. Segundo Fernandez, 850-521-0720

FROM: John Koogler

DATE: 9/25/00 SENT BY: Wendy

The text being transmitted consists of 3 page(s) PLUS this one. If you do not receive all of the pages or if there are difficulties with this transmission, please call (352) 377-5822.

RE:

KOOGLER & ASSOCIATES
ENVIRONMENTAL SERVICES
4014 NW THIRTEENTH STREET
GAINESVILLE, FLORIDA 32609
352/377-5822 • FAX/377-7158

KA 187-00-09

September 25, 2000

VIA FAX AND MAIL

Mr. Chris Kirts
Florida Department of
Environmental Protection
7825 Baymeadows Way Suite B-200
Jacksonville, FL 32256-7590

Subject: Florida Rock Industries
Thompson S. Baker Cement Plant
Permit AC01-267311/PSD-FL-228
VOC Emission Measurements

Dear Mr. Kirts:

As I discussed with Mr. Rick Banks of your office and Mr. Lalit Lalwani of the FDEP Northeast District Branch Office in Gainesville on Friday, September 22, 2000, compliance testing for volatile organic compounds (VOCs) was conducted at Florida Rock Industries Thompson S. Baker Cement Plant on Saturday, September 23, 2000. These compliance tests were the tests referenced in Kirby Green's letter to Segundo Fernandez dated September 20, 2000. The tests could not be conducted on or before September 22, 2000, as suggested in Mr. Green's letter, because of atypical plant operating conditions. The tests were conducted at the earliest date possible which was September 23, 2000. I would like to express our appreciation to you and your staff for allowing the compliance testing to proceed on a Saturday. As you are aware, this request was made only because of the urgency to demonstrate compliance with the permitted VOC emission limit at the earliest possible date.

I am providing you, at this time, with a summary of the results of the September 23, 2000, compliance testing. The average VOC emission rate was 7.33 pounds per hour compared with an allowable VOC emission rate of 10.74 pounds per hour at the clinker production rate at the time of testing of 89.5 tons per hour. The maximum permitted VOC emission rate is 11.55 pounds per hour.

The results of the three test runs are summarized in the attached table. The data show that the total hydrocarbon emission rate averaged 11.56 pounds per hour, the methane emission rate averaged 4.24 pounds per hour and the VOC emission rate (the difference between total hydrocarbons and methane) averaged 7.33 pounds per hour. During the compliance test period, the feed rate to the preheater averaged 140 tons per hour which is equivalent to a clinker production rate of 89.5 tons per hour. The permitted preheater feed rate and clinker production rate are 149.9 tons per hour and 95.8 tons per hour, respectively. The plant operated normally in the compound mode (both the kiln and raw mill operating) during the entire test period and 100 percent of the heat input to both the kiln and precalciner was provided by coal.

We will provide you with a complete test report as soon as possible. If there are any questions prior to receiving our report, please feel free to contact me at 352-377-5822.

Very truly yours,

KOOGLER & ASSOCIATES

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

JBK:wa
Enc.

C: Mr. Kirby Green
Mr. Larry Morgan
Ms. Trina Vielhauer
Mr. Howard Rhodes, FDEP, Tallahassee
Mr. Al Linero, FDEP
Mr. Ernest Frey, FDEP, Jacksonville
Mr. Lalit Lalwani, FDEP, Gainesville
Mr. Fred Cohrs, FRI
Mr. Cary Cohrs, FRI
Mr. George Townsend, FRI
Mr. Segundo Fernandez

Run	Preheater Feed (tph)	Total Hydrocarbons (as propane) (lb/hr)	Methane (as methane) (lb/hr)	VOC (lb/hr)
1	140	11.16	4.18	6.98
2	140	11.44	4.05	7.39
3	140	12.09	4.48	7.61
Avg	140(1)	11.56	4.24	7.33(2)

(1) Equivalent to 89.5 tph clinker
(2) Allowable VOC emission rate at 0.12 lb/ton clinker = 10.74 lb/hr

Florida Department of Environmental Protection
Northeast District
Enforcement Meeting September 18, 2000

Attendance

NAME	REPRESENTING	PHONE
RICHARD BANKS	DEP	904-448-4310 x234
CHRISTOPHER KIRTS	DEP	" x235
AL LINERO	DEP/BAR	850-921-9523
Trina Vielhauer	DEP/OGC	850-921-9875
ERNEST FREY	DEP-NED	904 448-4300 x201
SEGUNDO J. FERNANDEZ	FRI/OHFC	850-521-0700
FRED W. COHRS	FRE	904-355-1781
JOHN KOOGLER	FRI/KHA	352/377-5822
TIM ATKINSON	FRI/OHFC	850-521-0700

POLYSIUS
DIVISION OF KRUPP USA INC.
ATLANTA, GA

FLORIDA ROCK CEMENT PLANT

– NEWBERRY , FLORIDA –

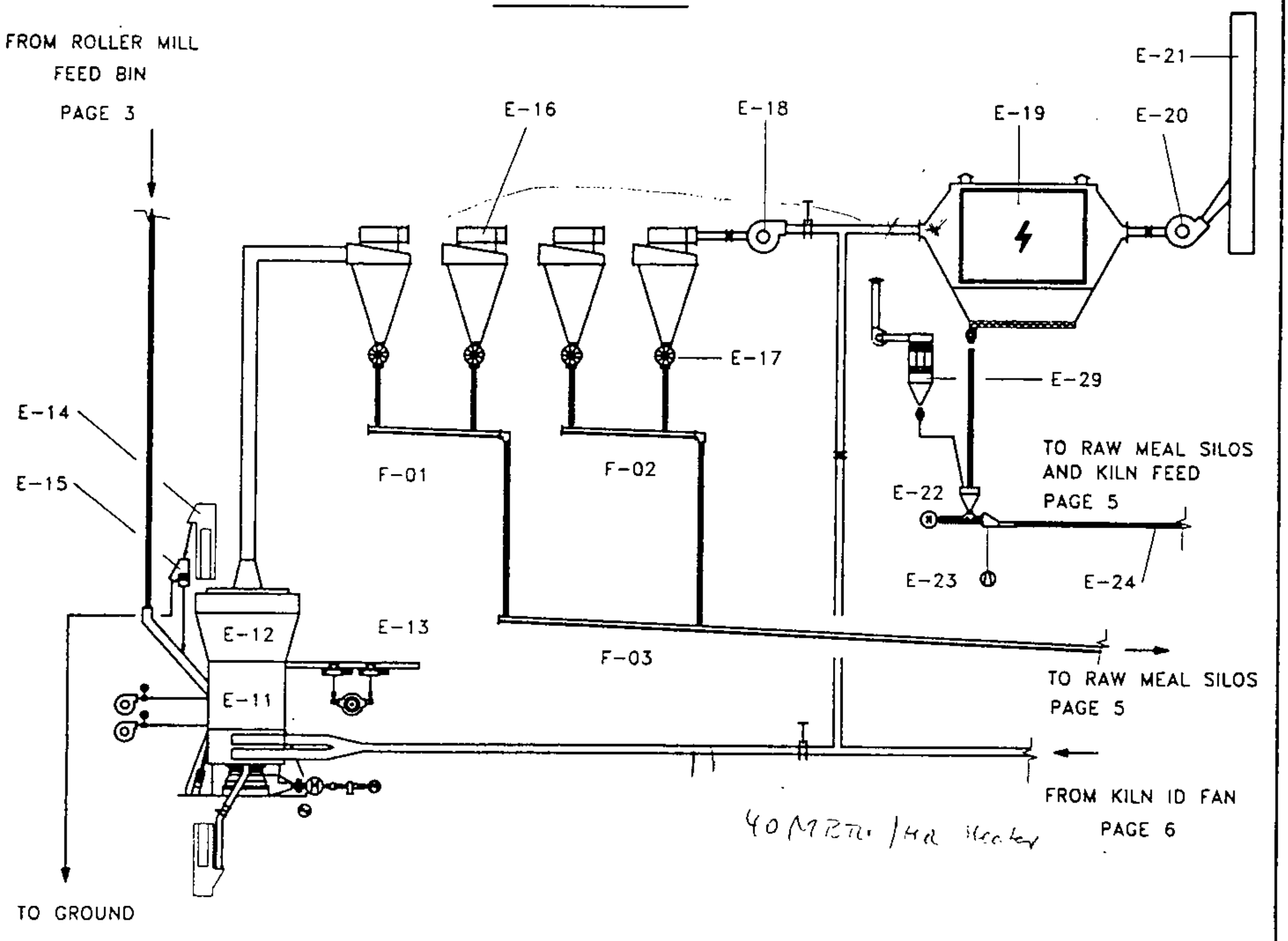
PROJECT No.:	6823-2200
PAGE:	4 of 14
DATE:	11-29-94

CAPACITY: 750,000 STPY

No.	REVISION DATE
1	01-15-95
2	02-07-95
3	

– RAW MATERIAL GRINDING WITH ROLLER MILL–

FLOW CHART



DESCRIPTION

TYPE OF MILL	:	ROLLER MILL w/ SEPOL
MILL CAPACITY	:	212 STPH (DRY)
FEED MATERIAL	:	RAW MIX
SIZE OF MILL	:	43/21 @ 2250 HP
SIZE OF SEPOL	:	RMS-315

230

Emission Factor Documentation for AP-42 Section 11.6

Portland Cement Manufacturing

Final Report

For U. S. Environmental Protection Agency
Office of Air Quality Planning and Standards
Emission Inventory Branch

EPA Contract 68-D2-0159
Work Assignment No. I-01

MRI Project No. 4601-01

May 18, 1994

PREFACE

This report was prepared by Midwest Research Institute (MRI) for the Office of Air Quality Planning and Standards (OAQPS), U. S. Environmental Protection Agency (EPA), under Contract No. 68-D2-0159, Work Assignment No. I-01. Mr. Ron Myers was the requester of the work. The report was prepared by Richard Marinshaw and Dennis Wallace.

Approved for:

MIDWEST RESEARCH INSTITUTE

Roy Neulicht
Program Manager
Environmental Engineering
Department

Jeff Shular
Director, Environmental Engineering
Department

May 18, 1994

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Portland Cement Manufacturing

1.0 INTRODUCTION

The document "Compilation of Air Pollutant Emissions Factors" (AP-42) has been published by the U. S. Environmental Protection Agency (EPA) since 1972. Supplements to AP-42 have been routinely published to add new emission source categories and to update existing emission factors. AP-42 is routinely updated by EPA to respond to new emission factor needs of EPA, State and local air pollution control programs, and industry.

An emission factor relates the quantity (weight) of pollutants emitted to a unit of activity of the source. The uses for the emission factors reported in AP-42 include:

1. Estimates of areawide emissions;
2. Estimates of emissions for a specific facility; and
3. Evaluation of emissions relative to ambient air quality.

The purpose of this report is to provide background information from test reports and other information to support the revision of AP-42 Section 11.6, Portland Cement Manufacturing.

This background report consists of five sections. Section 1 includes the introduction to the report. Section 2 gives a description of the portland cement industry. It includes a characterization of the industry, an overview of the different process types, a description of emissions, and a description of the technology used to control emissions resulting from portland cement production. Section 3 is a review of emission data collection and analysis procedures. It describes the literature search, the screening of emission data reports, and the quality rating system for both emission data and emission factors. Section 4 details revisions to the previous AP-42 section narrative and pollutant emission factor development. It includes the review of specific data sets and the results of data analysis. Section 5 presents AP-42 Section 11.6.

of these condensed materials can restrict process and gas flows. In a bypass system, a portion of the kiln exit gas stream is withdrawn and quickly cooled by air or water to condense the volatile constituents to fine particles. The solid particles, which are removed from the gas stream by fabric filters and ESP's, are then returned to the process.

The semidry process is a variation of the dry process. In the semidry process, the water is added to the dry raw mix in a pelletizer to form moist nodules or pellets. The pellets then are conveyed on a moving grate preheater before being fed to the rotary kiln. The pellets are dried and partially calcined on the moving grate through which hot kiln exhaust gases pass.

Regardless of the type of pyroprocess used, the last component of the pyroprocessing system is the clinker cooler. This process step recoups up to 30 percent of the heat input to the kiln system, locks in desirable product qualities by freezing mineralogy, and makes it possible to handle the cooled clinker with conventional conveying equipment. The more common types of clinker coolers are (1) reciprocating grate, (2) planetary, and (3) rotary. In these coolers, the clinker is cooled from about 1100°C to 93°C (2000°F to 200°F) by ambient air that passes through the clinker and into the rotary kiln for use as combustion air. However, in the reciprocating grate cooler, lower clinker discharge temperatures are achieved by passing an additional quantity of air through the clinker. Because this additional air cannot be utilized in the kiln for efficient combustion, it is vented to the atmosphere, used for drying coal or raw materials, or used as a combustion air source for the precalciner.

The final step in portland cement manufacturing involves a sequence of blending and grinding operations that transforms clinker to finished portland cement. Up to 5 percent gypsum or natural anhydrite is added to the clinker during grinding to control the cement setting time, and other specialty chemicals are added as needed to impart specific product properties. This finish milling is accomplished almost exclusively in ball or tube mills. Typically, finishing is conducted in a closed-circuit system with product sizing via air separation.

Figure 1. Process flow diagram for portland cement manufacturing (SCC = Source Classification Code)

2.3 EMISSIONS[1,2,4-8]

Particulate matter (PM and PM-10), nitrogen oxides (NO_x), SO_2, carbon monoxide (CO), and CO_2 are the primary emissions in the manufacture of portland cement. Small quantities of volatile organic compounds (VOC), ammonia (NH_3), chlorine, and hydrogen chloride (HCl), also may be emitted. Emissions may also include residual materials from the fuel and raw materials or products of incomplete combustion that are considered to be hazardous. Because some facilities burn waste fuels, particularly spent solvents in the kiln and these systems also may emit small quantities of additional hazardous organic pollutants. Also, raw material feeds and fuels typically contain trace amounts of heavy metals that may be emitted as a particulate or a vapor.

Sources of PM at cement plants include (1) quarrying and crushing, (2) raw material storage, (3) grinding and blending (in the dry process only), (4) clinker production, (5) finish grinding, and (6) packaging and loading. The largest emission source of PM within cement plants is the pyroprocessing system that includes the kiln and clinker cooler exhaust stacks. Emissions from kilns are affected by several factors, including differences in convective patterns, material movement patterns, burner locations and insertion lengths, heat transfer mechanisms, and the type of clinker cooler that supplies secondary air to the kiln for combustion. In addition, operators can vary the degree of calcination that takes place within a preheater or precalciner. Often, dust from the kiln is collected and recycled into the kiln thereby producing clinker from the dust. However, if the alkali

3.2 EMISSION DATA QUALITY RATING SYSTEM

As part of the analysis of the emission data, the quantity and quality of the information contained in the final set of reference documents were evaluated. The following data were excluded from consideration:

1. Test series averages reported in units that cannot be converted to the selected reporting units;

2. Test series representing incompatible test methods (i.e., comparison of EPA Method 5 front half with EPA Method 5 front and back halves);

3. Test series of controlled emissions for which the control device is not specified;

4. Test series in which the source process is not clearly identified and described; and

5. Test series in which it is not clear whether the emissions were measured before or after the control device.

Test data sets that were not excluded were assigned a quality rating. The rating system used was that specified by EIB for preparing AP-42 sections. The data were rated as follows:

A--Multiple tests that were performed on the same source using sound methodology and reported in enough detail for adequate validation. These tests do not necessarily conform to the methodology specified in EPA reference test methods, although these methods were used as a guide for the methodology actually used.

B--Tests that were performed by a generally sound methodology, but lack enough detail for adequate validation.

C--Tests that were based on an untested or new methodology or that lacked a significant amount of background data.

D--Tests that were based on a generally unacceptable method but may provide an order-of-magnitude value for the source.

The following criteria were used to evaluate source test reports for sound methodology and adequate detail:

1. Source operation. The manner in which the source was operated is well documented in the report. The source was operating within typical parameters during the test.

2. Sampling procedures. The sampling procedures conformed to a generally acceptable methodology. If actual procedures deviated from accepted methods, the deviations are well documented. When this occurred, an evaluation was made of the extent to which such alternative procedures could influence the test results.

3. Sampling and process data. Adequate sampling and process data are documented in the report, and any variations in the sampling and process operation are noted. If a large spread between

test results cannot be explained by information contained in the test report, the data are suspect and are given a lower rating.

4. Analysis and calculations. The test reports contain original raw data sheets. The nomenclature and equations used were compared to those (if any) specified by EPA to establish equivalency. The depth of review of the calculations was dictated by the reviewer's confidence in the ability and conscientiousness of the tester, which in turn was based on factors such as consistency of results and completeness of other areas of the test report.

3.3 EMISSION FACTOR QUALITY RATING SYSTEM

The quality of the emission factors developed from analysis of the test data was rated utilizing the following general criteria:

A--Excellent: Developed only from A-rated test data taken from many randomly chosen facilities in the industry population. The source category is specific enough so that variability within the source category population may be minimized.

B--Above average: Developed only from A-rated test data from a reasonable number of facilities. Although no specific bias is evident, it is not clear if the facilities tested represent a random sample of the industries. The source category is specific enough so that variability within the source category population may be minimized.

C--Average: Developed only from A- and B-rated test data from a reasonable number of facilities. Although no specific bias is evident, it is not clear if the facilities tested represent a random sample of the industry. In addition, the source category is specific enough so that variability within the source category population may be minimized.

D--Below average: The emission factor was developed only from A- and B-rated test data from a small number of facilities, and there is reason to suspect that these facilities do not represent a random sample of the industry. There also may be evidence of variability within the source category population. Limitations on the use of the emission factor are noted in the emission factor table.

E--Poor: The emission factor was developed from C- and D-rated test data, and there is reason to suspect that the facilities tested do not represent a random sample of the industry. There also may be evidence of variability within the source category population. Limitations on the use of these factors are always noted.

The use of these criteria is somewhat subjective and depends to an extent upon the individual reviewer. Details of the rating of each candidate emission factor are provided in Chapter 4 of this report.

REFERENCES FOR SECTION 3

1. *Technical Procedures for Developing AP-42 Emission Factors and Preparing AP-42 Sections, EPA-454/B-93-050*, Office of Air Quality Planning and Standards, U.S. Environmental Protection Agency, Research Triangle Park, NC, October 1993.

4.0 AP-42 SECTION DEVELOPMENT

4.1 REVISIONS TO SECTION NARRATIVE

The revised AP-42 section described in this report replaces the September 1991 portland cement manufacturing section of AP-42. The process description and emissions and controls discussion in the previous version had major flaws. Specifically, components of the process other than pyroprocessing were not described (although emission factors were presented for other operations); the different types of dry processes (long dry kiln, dry kiln with preheater, and dry kiln with preheater/precalciner) were not clearly delineated, and the use of waste fuels by the industry was not discussed. Information contained in the recently updated Air Pollution Engineering manual and materials supplied by the PCA on industry characteristics and CO_2 emissions were used to update the discussion.

4.2 POLLUTANT EMISSION FACTOR DEVELOPMENT

A total of 80 documents were reviewed in the process of developing emission factors for this revision to the AP-42 section on portland cement manufacturing. Emission factors were developed from the data presented in 62 of these references. A list of the references used to develop emission factors is presented in Table 4-1.

emissions; the unspecified control device test was rated D and discarded. After combining the results of multiple tests on the same kiln, the number of data sets was reduced to five B-rated data sets and two C-rated data sets. The emission factors developed from the B-rated data ranged from 1.1 kg/Mg (2.2 lb/ton) to 3.6 kg/Mg (7.1 lb/ton) and averaged 2.1 kg/Mg (4.2 lb/ton). The emission factors developed from the C-rated data ranged from 1.5 kg/Mg (3.1 lb/ton) to 4.8 kg/Mg (9.5 lb/ton) and averaged 3 4 kg/Mg (6 7 lb/ton). Only the B-rated data were used. The average emission factor developed from the B-rated data is assigned a rating of D.

Carbon monoxide. For CO emissions from preheater/precalciner kilns, data were available from 12 tests on 6 kilns. One of the tests was conducted on a kiln controlled with an ESP and the remaining 11 tests were conducted on fabric filter-controlled kilns. Because ESP's and fabric filters are expected to have negligible effects on CO emissions, all data sets were treated as measurements of uncontrolled CO emissions. After combining the results of multiple tests on the same kiln, the number of data sets was reduced to one A-rated test, three B-rated data sets, and one C-rated data set. The results of the A-rated test yielded an emission factor of 4.4 kg/Mg (8.7 lb/ton). The emission factors developed from the B-rated data ranged from 0.60 kg/Mg (1.2 lb/ton) to 1.3 kg/Mg (2.5 lb/ton) and averaged 0.86 kg/Mg (1.7 lb/ton). The C-rated data yielded an average emission factor of 0.50 kg/Mg (0.99 lb/ton). The C-rated data were discarded and an average emission factor of 1.8 kg/Mg (3.7 lb/ton) was developed from the combined A- and B-rated data. This emission factor is rated D.

Carbon dioxide. For CO_2 emissions from preheater/precalciner kilns, 12 data sets were available for ESP- or fabric filter-controlled kilns. All data sets were treated as measurements of uncontrolled CO_2 emissions. After combining the results of multiple tests on the same kiln, the number of data sets was reduced to six. One of these data sets was rated A, three of the data sets were rated B, one data set was rated C, and one of the data sets was rated D. The A-rated data resulted in an emission factor of 970 kg/Mg (1,900 lb/ton). The emission factors developed from the B-rated data ranged from 820 kg/Mg (1,600 lb/ton) to 1,000 kg/Mg (2,100 lb/ton) and averaged 900 (1,800 lb/ton). An emission factor of 1,400 kg/Mg (2,800 lb/ton) was developed from the C-rated data. The A- and B-rated data were combined for an average emission factor for uncontrolled CO_2 emissions from preheater/precalciner kilns of 920 kg/Mg (1,800 lb/ton). This average emission factor is higher than the average CO^2 emission factor for preheater kilns. However, because preheater/precalciner kilns are more efficient than preheater kilns, the average CO_2 emission factor for preheater/precalciner kilns should be lower than the CO_2 emission factor for preheater kilns. Therefore, it is recommended that the average CO_2 emission factor for preheater kilns be used as an upper estimate for the emission factor for preheater/precalciner kilns. Because this emission factor is not based on preheater/precalciner kiln test data, it is assigned a rating of E.

Volatile Organic Compounds. For preheater/precalciner kilns, data were available from ten tests of TOC emissions conducted on three kilns all of which were controlled with fabric filters. After combining the results of multiple tests on the same kiln, the number of data sets was reduced to three, one A-rated, one B-rated, and one C-rated tests. Because fabric filters should have negligible effects on VOC emissions, the results were considered to be measurements of uncontrolled emissions. The C-rated data were discarded, and the results of the A- and B-rated tests were combined to yield an average emission factor of 0.059 kg/Mg (0.12 lb/ton) for uncontrolled TOC emissions from preheater/precalciner kilns. This emission factor is rated D.

4.2.5.5 Noncriteria Pollutant Emissions From Portland Cement Kilns. The remaining data sets on emissions from portland cement kilns consist of measurements of a number of inorganic and

CONTINUOUS STACK GAS FLOW RATE MONITORING SYSTEM CERTIFICATION

KILN/RAW MILL STACK

FLORIDA ROCK INDUSTRIES
THOMPSON S. BAKER CEMENT PLANT
NEWBERRY, FLORIDA

SEPTEMBER 5, 2000

KOOGLER & ASSOCIATES
ENVIRONMENTAL SERVICES
4014 NW 13TH STREET
GAINESVILLE, FL 32609
352-377-5822

KOOGLER & ASSOCIATES
ENVIRONMENTAL SERVICES

To the best of my knowledge, all applicable field and analytical procedures comply with the Florida Department of Environmental Protection requirements and all test data and plant operating data are true and correct.

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

State of Florida
Registration No. 12925

9/5/09

Date

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1.0 INTRODUCTION

Florida Rock Industries owns and operates a 2300 ton per day (clinker) dry process precalciner Portland cement plant on CR 235, two miles north of the city center of Newberry, Florida. During the period July 5-20, 2000, Koogler & Associates Environmental Services of Gainesville, Florida, certified the continuous stack gas flow rate monitoring system (CFRMS) located on the kiln/raw mill stack. This system is part of the continuous NOx and SO_2 emission rate monitoring systems (CERMS) for the kiln/raw mill. The NOx and SO_2 CERMS incorporates signals from the CFRMS and the NOx and SO_2 CEMS to report the continuous mass emission rate (pounds per hour) of NOx and SO_2. The certification of the NOx CEMS was reported under separate cover. The CEMS for sulfur dioxide has not been certified at this time as the SO_2 CEMS is in the process of being replaced. A temporary SO_2 CEMS is presently in operation and provides an interim signal to the SO_2 CEMS.

The certifications for the flow rate monitoring system and the emission rate monitoring system were conducted in accordance with the requirements of 40 CFR 60, Appendix B, Performance Specification 6 and 40 CFR 75, Appendix A.

The purpose of this certification was to provide the initial certification of the CFRMS required by Permit AC01-267311/PSD-FL-228. The certification of the CFRMS and the previously reported certification of the NOx CEMS represent a certification of the

NOx CERMS as this system is dependent upon signals from the two certified systems.

The Northeast District Office of the Florida Department of Environmental Protection (FDEP) in Jacksonville, the FDEP Northeast District Branch Office in Gainesville and FDEP in Tallahassee, Florida, were all notified of the certification schedule.

The data reported herein demonstrates that the CFRMS successfully met the EPA certification requirements.

2.0 MONITOR SPECIFICATIONS

The specifications of the CFRMS are described herein and monitoring and specifications provided by the manufacturer are included in the Appendix of this report.

The CFRMS consists of a Kurz Instruments, Inc. Model 452-08-MT Insertion Mass Flow Element and a Model 155JR (Serial No. 5430) Mass Flow Computer. The system measures stack gas flow on a standard (77°F and 29.92 in. Hg) velocity of flow of wet gas per unit of time basis. The signal from this monitoring system is incorporated with the cross sectional area of the stack in the Mass Flow Computer to provide a volumetric flow rate of stack gas. The reporting units are standard cubic feet per minute wet at 77°F and 29.92 in. Hg.

The Mass Flow Computer of the CFRMS also has the capability of accepting adjustment factors to correct observed CFRMS volumetric flow rates to the standard temperature (68°F) referenced by EPA test methods and to flow rates measured with a referenced method (EPA Method 2, 40 CFR 60, Appendix A). Multiple adjustment factors can be entered into the Mass Flow Computer; e.g., adjustment factor for high flow rates, mid-range flow rates and low flow rates. Once these factors are entered, the Mass Flow Computer will calculate an unadjusted flow rate, selecting an adjustment factor appropriate for that flow rate, and calculate and

report an adjusted flow rate. For adjustment factors between those input to the Mass Flow Computer, the computer linearly interpolates to obtain appropriate adjustment factors. It should be noted that these adjustment factors also incorporate the correction from the standard temperature of the instrument (77°F) to the standard temperature referenced by EPA test method (68°F or 20°C).

During the certification period, adjustment factors were developed for a high flow rate range (with the kiln and raw mill both operating - compound operating mode) at a mid-range flow rate and at a low range flow rate (with the kiln only operating - direct operating mode). These adjustment factors were input to the Mass Flow Computer so that the stack gas flow rates reported by the Kurz CFRMS is in units of standard cubic feet per minute wet (20°C and 29.92 in. Hg), adjusted to flow rates measured by the EPA referenced method.

A description of the CFRMS and instrument specifications are included in the Appendix of this report. The specifications of the CFRMS meet the requirements of 40 CFR 60, Appendix B, Performance Specification 6 and 40 CFR 75, Appendix A. The instrument span is equivalent to a stack gas velocity of 9033.8 standard cubic feet per minute, wet. This velocity is equivalent to a stack gas flow rate of approximately 607,700 standard (77°F and 29.92 in Hg) cubic feet per minute, wet. This flow rate is approximately 380 percent of the maximum flow rate of observed during the certification period. In accordance with Section 2.1.4, 40 CFR 75,

ACID MIST AND BERYLLIUM EMISSION MEASUREMENTS

KILN/RAW MILL

FLORIDA ROCK INDUSTRIES
THOMPSON S. BAKER CEMENT PLANT
NEWBERRY, FLORIDA

PERMIT NO. AC01-267311/PSD-FL-228

JULY 21 AND 24, 2000

KOOGLER & ASSOCIATES
ENVIRONMENTAL SERVICES
4014 NW 13TH STREET
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1.0 INTRODUCTION

Florida Rock Industries owns and operates a 2300 ton per day (clinker) dry process precalciner Portland cement plant on CR 235, two miles north of the city center of Newberry, Florida. On July 21 and 24, 2000, Koogler & Associates Environmental Services of Gainesville, Florida, conducted sulfuric acid mist and beryllium emission measurements on the kiln/raw mill stack in accordance with EPA Test Method 8 (40 CFR 60, Appendix A) for acid mist and Test Method 104 (40 CFR 61, Appendix B) for beryllium. The purpose of the testing was to establish emission rates for these two air pollutants as required by Permit AC01-267311/PSD-FL-228.

The Northeast District Office of the Florida Department of Environmental Protection (FDEP) in Jacksonville, the FDEP Northeast District Branch Office in Gainesville and FDEP in Tallahassee, Florida, were notified of the scheduled initial air emission performance tests and testing protocol at the cement plant.

During the acid mist test period, the kiln was operating at a preheater feed rate of 139.8 tons per hour and during the beryllium test period, the kiln was operating at a preheater feed rate of 138.3 tons per hour; both within 10 percent of the permitted feed rate of 149.9 tons per hour. Permit AC01-267311 limits the preheater feed rate to 149.9 tons per hour, which approximately corresponds to a permitted clinker production rate of 95.8 tons per hour.

The permit for the plant limits acid mist and beryllium emissions from the kiln/raw mill to rates established by Best Available Control Technology and specifies that the emission limits for these air pollutants be established based on "future stack tests". The emission measurements reported herein represent the initial emission measurements on the plant for acid mist and beryllium.

The emissions from the kiln/raw mill are controlled by electrostatic precipitators (ESPs). The measured mass emission rate of acid mist from the kiln/raw mill averaged 0.0003 pounds per hour and beryllium emissions averaged 0.06 pounds per hour.

2.0 SAMPLING POINT LOCATIONS

Four sample ports are located in the 112-inch diameter, 241-foot high stack exhausting the kiln/raw mill. The ports are 50.6 feet (5.4 stack diameters) below the top of the stack and 146.8 feet (15.7 diameters) above the point where the kiln/raw mill gases enter the stack. Based on the requirements of EPA Method 1 (40 CFR 60, Appendix A), 12 sample points were selected; three points through each of the four ports.

3.0 FIELD AND ANALYTICAL PROCEDURES

Sulfuric acid mist emission measurements were conducted on the kiln/raw mill stack using EPA Method 8 and beryllium emission measurements were conducted using EPA Method 104. The sampling point locations for the two EPA methods were established in accordance with EPA Method 1. Stack gas velocity measurements and stack gas moisture measurements were made in conjunction with the EPA Method 8 and 104 tests in accordance with EPA Methods 2 and 4. Measurements to determine the dry molecular weight of the stack gas were made in accordance with EPA Method 3. All EPA tests methods are described in 40 CFR 60, Appendix A or 40 CFR 61, Appendix B and have been adopted by reference by FDEP by Rule 62-297.401, F.A.C. There were no variations or exceptions to any of the referenced test methods.

4.0 SUMMARY OF RESULTS

The sulfuric acid mist emission measurements made on July 21, 2000, are summarized in Table 1. The acid mist emission rate from the kiln/raw mill ranged from non-detectable to 0.0009 pounds per hour and averaged 0.0003 pounds per hour. The stack gas flow rate from the kiln/raw mill averaged 127,703 standard cubic feet per minute, dry (193,072 acfm). The stack gas temperature averaged 219°F and the moisture content averaged 14.9 percent.

The beryllium emission rate from the kiln/raw mill, measured on July 24, 2000, ranged from 0.01 to 0.12 pounds per hour and averaged 0.06 pounds per hour. These data are summarized in Table 2. The stack gas flow rate from the kiln/raw mill during the beryllium tests averaged 106,903 dry standard cubic feet per minute (165,420 acfm), the stack gas temperature averaged 231°F and the stack gas moisture averaged 16.3 percent.

These emission measurements represent the initial acid mist and beryllium emission measurements on the kiln/raw mill required by Permit AC01-267311. These data will be used by FDEP to establish emission limits for acid mist and beryllium for the kiln/raw mill.

Calculations, field and analytical data sheets, plant operating information, equipment calibration sheets and a list of project participants are included in the Appendix of this report.

TABLE 1
SULFURIC ACID MIST EMISSION TEST DATA

FLORIDA ROCK INDUSTRIES, INC
NEWBERRY, FLORIDA

SOURCE: Kiln/Raw Mill Stack

DATE: July 21, 2000

Run No.	Stack Flow Rate (SCFMD)	ACID MIST Conc. (lbs/DSCF)	Emission Rate (Lbs/Hr)	Conc. (mg/DSCF)	Conc. (mg/ACF)
1	124,881	0.00E+00	0.000	0.0000	0.0000
2	126,717	2.88E-09	0.022	0.0013	0.0009
3	131,511	0.00E+00	0.000	0.0000	0.0000
Avg.	127,703	9.59E-10	0.007	0.0004	0.0003

TABLE 2
BERYLLIUM EMISSION TEST DATA

FLORIDA ROCK INDUSTRIES, INC.
NEWBERRY, FLORIDA

SOURCE: Kiln/Raw Mill Stack

DATE: July 24, 2000

Run No.	Process Weight Rate (Tons/hr)	Stack Gas Flow Rate (SCFMD)	Stack Gas Temperature (F)	Stack Gas Moisture (%)	Total Beryllium Conc. (gr/dscf)	Total Beryllium Emission Rate (Lbs/Hr)
1	135.0	93,275	246	17.0	0.0001	0.06
2	140.0	98,112	248	16.0	0.0001	0.12
3	140.0	129,320	200	16.0	0.0000	0.01
Average	138.3	106,903	231	16.3	0.0001	0.06

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